THE PRODUCTIVITY DISCOURSE:

CONSTRUCTING THE ECONOMIES OF FRANCE AND THE UNITED STATES

DURING THE TWENTIEH CENTURY

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ABSTRACT

The productivity discourse, constructing the economies of France and the United States during the 20th century analyzes the way in which mathematical models of productivity – as well as the rhetoric of productivity – powerfully influenced policy-making in France and the United States during the last century. The research reveals that social meanings attached to the concept of productivity, and the lens through which we attribute the source of productivity growth shifted, over time, and that these shifts related to changes in the social context. The larger finding exposes the potency of economic indicators to act as organizing principles, with the research showing how countries respond to changes in their relative rankings.

The dissertation research is premised on the assumption that the productivity discourse would neutralize divisive interests because of its promise that "more" would be available for less – and for all. The evidence collected from public debates in France and the United States suggests this presumption to be clearly correct. The research additionally reveals the sheer competitive force of a country's *relative* productivity ranking as an economic organizing principle. Because the numbers and models used to conceptualize productivity tend to shift with changes in the social context, essentialist properties of productivity are placed in doubt, thereby providing the grounds for novel interpretations about how economies are constructed and become transfigured over time. The fact that social meanings attached to productivity translated fairly well across two countries – France and the United States – with very different institutional configurations, more fundamentally, reveals the power of ideas as organizing principles in economies and presents a challenge to the *Varieties of Capitalism* literature.

Acknowledgement

Anyone, who has written a dissertation, understands that the work delivered is a product that has been inspired, directed, facilitated, and/or sustained by the presence and dedication of nearly everyone with whom the writer has been associated during the long, and sometimes *seemingly* isolating, years of effort. For someone, who frequently quips that she could not possibly do anything collective in nature to save her life, I most gratefully acknowledge the support and encouragement of the following individuals (and all the others, too numerous to mention) in helping to bring this project to fruition:

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Three economists helped me to understand the issues at play from their own perspective: Nobel laureate and MIT professor Robert M. Solow, the late NBER economist and professor (Queens College and the Graduate Center, CUNY) Robert Lipsey and MIT professor Erik Brynjolfsson MIT (Sloan School of Management). The work and considerations of these three accomplished scholars were instrumental to the way in which I finally drew my queries to an end. More importantly, their singular work and ideas provided that essential qualification in scholarship that interpretations and explanations can differ, thereby reminding me to preserve the open quest for knowledge and its development.

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Chapter 1: Introduction

If I had asked people what they wanted, they would have said faster horses.[1]

Henry Ford

The counterfactual is suggestive. The counterfactual suggests that demand can be constructed. But the counterfactual conveys something more: value is presumed attached to "faster." Why is value attached to faster? This dissertation explores potential answers to the question by probing the scientific and social concept of productivity, an ostensibly unambiguous arithmetic derivation, output divided by inputs invested. The claim being made in this dissertation is that scientific and social meanings of productivity shifted over time during the 20th century, seriously challenging the commonly held notion that productivity derives from essentialist properties, detached, or completely bracketed, from the social context. At one point in time, productivity was equated with efficiency and speed – we needed more and faster. But the agency that helped produce that specific need or desire, arriving in the persona of one inventor, Henry Ford, suggests yet one more clue to the puzzle. Our wants are not givens, and we are not consigned to a particular production mode, or model of economic organization. Those with resonating ideas wield organizing power.[2]

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[1] The quote can be found at: http://quotationsbook.com/quote/47228/

[2] Henry Ford is also quoted as saying, "Any customer can have a car painted any color that he wants so long as it is black." This quip refers to the fact that Model T's were available in any color until the assembly line became the production norm; black then became the exclusive color available because of its faster drying time. Henry Ford and Samuel Crowther (1922), *My Life and Work,* Garden City, New York: Garden City Publishing Co., Inc., p. 72

Productivity: what is it?

In the pages to follow, shifts in the scientific and social meanings attached to productivity are investigated, given that its raw technical definition, output per input invested, has proven steady over time, or at least during the time period covered in this dissertation. To this end, questions need to be asked in order to understand how productivity came into play as a "common sense"[3] term in industrial countries and, for the purposes of this study, in France and the United States during the twentieth century. To begin this exploration, the critical question to ask is *why* this definition gained widespread currency in economies during the last century, in the midst of rapid economic transformation, and whether alternatives to this definition could well have served the purpose of defining "productivity." Moreover, even if the technical definition of productivity has held constant over time, the way in which "output" and "input" are defined must be further parsed – what is included as output and input is a choice, and choice suggests a valuation of some sort, whether it be pragmatism or a privileging of what is considered to be important in terms of gauging social welfare. In this sense, understanding how these seemingly unambiguous terms are defined and measured imparts an understanding of what societies value. If the way in which the parts and aims of production are addressed shifts over time, then we would be inclined to believe that meanings may be more plastic and ambiguous than what the simple formula for productivity implies. More fundamentally, we might wish to assess *what exactly productivity is.* What, for example, does productivity represent? In other words, what is the end goal of productivity? Is the objective to reduce labor costs, or enhance efficiency? Is the goal to create a wider range of consumer products with fewer inputs invested, or is it to ensure competitiveness with other countries? Do values attributed to productivity tell us something about what we believe to be the ultimate performance measure of economic organization?

Finally, it is important to understand what is considered to be the source of productivity growth. The accounting exercise provides an indication of whether productivity is rising or not – either the numerator is

[3] The reference is to the work of Antonio Gramsci. See, for example, Antonio Gramsci (1971), *Selections from the Prison Notebooks of Antonio Gramsci,* New York: International Publishers. The way in which the work of Gramsci may fit into this dissertation as a theoretical reference is discussed in chapter 3.

rising relative to the denominator or the numerator remains constant, while the denominator decreases. But, what drives productivity growth, and has the way in which we conceptualize presumed sources of productivity growth shifted over time? Would a shift indicate a progressively more complete and scientific understanding of productivity, or would it reflect a break in our belief systems that related, in some way, either to the social context or to the objective we attribute to productivity growth, or both? If it is the latter, we might, again, infer that productivity, as a seemingly straightforward measure, does not fully disclose the complexity that undergirds its construction.

This research does not query the imperfectability of productivity measurement as a way of discounting the sense and purpose of delivering an indicator that may or may not tell us something about the robustness of an economy, however defined. Whether or not "productivity" can be perfectly captured in a statistical measurement is of limited, and only indirect, relevance to this study; the dissertation is focused on *meaning* and not the accuracy of economic indicators. In other words, it is assumed that economic measures only inadequately represent the concepts they attempt to portray, and attempts to improve upon the measures count as an endeavor that is fully acknowledged and appreciated.

For the present purposes, rather, the relevant question to ask is whether imperfections in the measures, or proxies that are used to represent ideas that cannot be perfectly measured, influence the ways in which we think about productivity? It would not be counterintuitive to presume that numbers, once produced, assume a life of their own; numbers, as will be argued in forthcoming chapters, can be compared. Numbers do not reason for themselves, nor do they reveal the decisions that have been taken to produce them. It is the "politics of large numbers"[4] that is being explored in this dissertation – what numbers do – not the technical and perhaps deficient way in which they are constructed.

[4] See chapter 2 for scholarly references to this concept.

Productivity is often associated with a higher standard of living, a claim that is supported by arguments found in public policy debates, though the connection is contested.[5] It is not difficult to understand why the connection is, nevertheless, made. Productivity growth is defined as greater output per inputs invested, or the same level of output, with fewer inputs invested. As such, productivity becomes the promise of more for less, a politically neutralizing concept for one simple reason: productivity growth imparts the message that growth entails no opportunity costs. Said otherwise, productivity growth implies that all social groups benefit; no one sacrifices. In some sense, and because of this message, productivity might simply represent "progress" or "hope" – or has come to represent these ideas. It is the latter element that transforms a parsimonious model that orders "facts" about economies into a potent political tool. As such, productivity has the potential to play a key role in economic organization. Whatever is mandated in the name of productivity has force.

In brief summary, the key question regarding why the concept "productivity" maintained purchase throughout the socially transforming twentieth century can be answered as follows:

- The discourse on productivity was politically neutralizing by suggesting more could be had with less; the discourse, in addition, became representative of a higher standard of living

- The neutralizing element of the discourse facilitated policy passage, when productivity became a central argument in favor or against legislative or other policy initiatives; because the discourse transfigured over time to reflect shifts in social values, productivity rhetoric was able to maintain its resonance

- By becoming reified in number form, productivity was made comparable, providing benchmarks of economic success or failure. As such, productivity measures became organizing principles among countries eager to compete on the basis of productivity performance as though it were a zero-sum game

[5] See comments of Nobel Laureate Robert M. Solow in the conclusion of this dissertation, p. 436.

Who legitimized the productivity discourse?

As would be acknowledged by any participant in contemporary society, the word "productivity" populates our daily speech; to be productive is to have achieved something positive, presumably. Either we have worked harder and more quickly or we have obtained an outcome we sought. These comments convey a kind of pervasiveness of the word "productivity," but they leave us clueless as to how the word came into everyday parlance and *to whom* we owe its social value and meaning. Because productivity is a concept central to economic theory generally, and theories of economic growth in particular, it stands to reason that the scientific discourse on productivity would be central to the derivation and subsequent spread of the concept into the economy at large. The scientific discourse has been largely directed, and with some variation depending on the particular historical point in time, by economic elites and other scholars and their views are found in the scholarly literature. By limiting the analytical focus to key journals, as well as to authors, who were connected either to high-profile universities and other institutions, such as the National Bureau of Economic Research (NBER) and the Bureau of Labor Statistics (BLS), the analysis is likely to represent influential thinkers in the field. These are the individuals, who become the *who*, in terms of those generating ideas about productivity.

But how can we be sure that the ideas of economic elites spread to other social locations, that they do not simply spin ideas within their own ivory towers and for a sense of intellectual-aesthetic self-fulfillment? One way to gauge the influence of elite thoughts, of course, is to look for their diffusion. In the case of economic and other scholarly elites, who wrote noteworthy work about productivity and productivity growth, we would want to understand their connection with political elites, or those mandated to guide the economic future of their countries. Did De Gaulle or Truman explain to their respective populations what they *believed* productivity to be? Did these leaders refer to scientific experts, or had they simply taken it for granted that it meant the achievement of a particular aim, linked somehow to progress and prosperity? Another way to understand who is generating ideas that resonate widely is to look at public legislative debates. Do French parliamentarians and US congressmen explain to experts their ideas about productivity and its source of growth, or do they refer to scientific experts, or call upon them to deliver expert

testimony? The fact that one group of experts may create ideas, while the other applies them, does not make one group more complicit – or organizing – than the other. Both groups comprise the "*who*," ensuring that the discourse continues, becomes further entrenched in the economy and then reproduced.

Once ideas become legislated, the question becomes: where do these ideas next appear? Without taking surveys of businesses and other operations that may be (had been) directly influenced by the legislation passed, we can think of further conduits through which ideas spread, such as the popular press. Laws may have organizing effects in economies; how those effects play out in the economy would, intuitively reasoned, be covered in the popular press. Business magazines may further seed and root the discourse on productivity – business leaders and the more general readership of such magazines become another member of the "*who,*" insofar as they perpetuate the discourse by either applying its principles to their own work practices, or simply gauging the success of themselves, or others under the terms offered. Is your company more productive than your competitors?

To suggest that economists are the "*who,*" corralling us into a particular meaning of productivity, would be a boring and prosaic interpretation of the way in which ideas spread. Certainly, the authority conferred on scientific experts, such as economists, provides them latitude in terms of propagating ideas; experts are experts, because society has agreed to award them legitimacy, given defined constraints, such as education and certification. The arrangement is consensual. Economists are free to promote their ideas, and we are free to challenge and discuss these ideas. That we tend to accept particular ways of looking at economic organization or key economic concepts, such as productivity is not counterintuitive – concepts become accepted as "common sense" as they settle into our everyday use and meaning. Did Robert Solow coerce us into believing that technology, broadly defined, accounts for the way in which the production function shifts outward, enabling the economy to produce more with less? The proposition is dubious. Discourse, as a "pattern of activity,"[6] makes us all, to some extent, complicit in its spread. The *who* is us.

[6] Patrick T. Jackson has offered this definition of discourse. See chapter 3 under the "Method" section for further discussion.

This claim will be challenged by those, who see a dominant role played by interest groups in terms of what meanings are accepted and practiced, as well as how economies become organized; meaning may be coercive, in other words. Well, maybe. Those who decide that a six-hour day is sufficiently productive may well lose their job; institutions constrain, but ideas come first, and the eight-hour day is no more than a norm, a idea that plausibly became entrenched with the spread of Taylorism and its principles. We might take a more specific example. Pfizer wields power and may lobby congress to pass a law favorable to company interests. But, for Pfizer to be able to lobby on its own behalf, the opportunity to do so has to be there in the first place; lobbies derive from ideas and operate differently from country to country. What if Pfizer decides to support legislation in the name of "higher productivity" and "competitiveness" for the US economy? Does the latter play any role in terms of how the legislator makes his or her decision?[7] It might because the rhetoric helps legitimize the decisions made. We could, on the contrary, argue that everything is self-interest; rhetoric and our *perception* of interests plays no role in how we perceive the choices available to us. Truly, though, self-interest and power do not explain important social concepts, such as "responsibility," as one simple example, nor does it enlighten us how (to be heavy handed) former wielders of power, such as Adolf Hitler, Joseph Stalin, and Joseph McCarthy, do not go down in history as exemplars of human dignity and inspiration. Power interests must operate within the arena of ideas.

Where can we see the productivity discourse at work?

Because institutional configuration is central, or presumed to be central, to economic organization, the role played by institutions versus the *ideas* of productivity have to be differentiated in this research. The most straightforward way to tease out the separate effects of ideas versus institutions is to compare countries with similar potential for economic development, but characterized by different institutional configurations. The United States, classified as a liberal economy,[8] predicated on the principles of *laissez-faire* economics, led the industrialized countries in the search for productivity and its measurement, early on in the twentieth century, beginning with Taylorism and then moving into Fordism. How did other countries view these

[7] The idea that rhetoric may be causal in outcomes observed is explored in Ronald R. Krebs and Patrick Thaddeus Jackson (2007), "Twisting tongues and twisting arms: the power of political rhetoric," *European Journal of International Relations,* 13:1, pp. 35-66.
[8] See chapter 2 for further discussion of economy typologies.

organization models? France comes to mind as an interesting country for comparison, as it is characteristically referred to as a *statist* economy, [9]drawing from the strength of the state to help direct its organizational course. By comparing the United States and France, the way in which the differences in each country's institutional order does or does not influence the force and direction of the productivity discourse can prove illuminating. For example, do political elites in the United States promote a *laissez-faire* approach to the promotion of productivity growth, or do they legislate for it? Do French political elites adopt their own notions of productivity, its source of growth and plans for achieving it, or do they cast their eyes across the Atlantic to understand how to implement American idea about productivity?

In the varieties of capitalism literature,[10] countries specialize in industries for which their institutional structures confer comparative advantage. At one level, by comparing two different varieties of capitalism – a liberal country against a statist country – some of the claims made in the literature may be considered, not as a key research question, but as an exploratory side question that relates to the main research question. For example, in this literature, institutional configurations are givens. By assessing the impact of the productivity discourse on institutional configuration in two countries presumed to be structurally different, we might gain better insight into how these institutions came into play, in the first place, or how they might be subject to change.

Hence, the *where* does not derive from any preordained country selection, but a selection based on the simple principle of choosing one, which dominates a particular discourse and another that is exposed to the discourse, though is situated differently in terms of its relative power and institutional framework. The research also attempts to reveal how ideas traverse economies, if they do – and if they do, by what mechanism? Choosing two countries for comparison aids our analysis. We could further ask: does a comparison of two countries relate to the principle research question of whether productivity is an economic concept grounded in objective, essentialist properties? It does. We might infer that cross-

[9] See chapter 2 for a discussion of the characterization of liberal versus statist economies.
[10] See chapter 2 for a critique of this literature.

fertilization of ideas in countries with social contexts that differ in some respects[11] would grant the discourse further powers, still, to effect change. More pointedly, such would help us to better understand what promotes and entrenches the idea of productivity. If French elites, like US legislators, respond to shifts in the rhetoric of productivity in a similar way, then the claim that productivity is grounded in essentialist patterns would be weakened, provided the shifts were not attributable to a further step in the inevitable progression towards "the truth." The social *meanings* of productivity, in this sense, could be described as contagious and not existing in a detached void, like a sun rising each morning, indifferent to worldly politics and events. In other words, by comparing two countries, and their respective interpretations of the productivity discourse, we provide yet another test of the force of discourse to promote change.

When, at what historical junctures, did meanings attached to productivity shift?

The twentieth century provides the historical frame of reference. Similar to the argument made for the countries chosen, the time frame of study could have been different. The twentieth century,[12] though, is a particularly interesting historical period to study, as it was during this point in time that the scientific discourse on productivity gained momentum, beginning with the hugely influential work of Frederick W. Taylor, *The Principles of Scientific Management.*[13] Fordism was to follow, with its new ideas about production processes and their link to labor wages providing an opportunity to see what connection, if any, might be made between the ideas of Fordism and the way in which productivity was framed as an economic concept.

By the time that information technologies were beginning to change the ways in which work practices were organized, the prosperous postwar years were winding down, and many industrialized countries experienced declining productivity growth. This "break point" provides an opening to analyze the effects of

[11] It bears reflecting that France and the United States shared a broader frame of social context: the end of World War II and the Cold War, prosperous postwar years and, finally, declining productivity growth, starting from the end of the 1970s.
[12] In this dissertation, the full span of the twentieth century is covered only for the scientific discourse. The policy discourse and popular discourse are limited to the early postwar years and the 1980s-1990s, when information technologies began to play an important role in work organization. The latter limitation is for pragmatic reasons, only and justified on the grounds that a match between the different locations of discourse at two points in time is compelling evidence for the ability of discourse to spread.
[13] See chapter 4 for a discussion of this work.

social and technological change on the concept of productivity. Do declining rates of growth alter the way in which the source of productivity is understood and accepted? It is an interesting proposition to test. For these reasons, the 20th century is argued to provide a rich backdrop against which to observe and discern the effects of change. The "break points" may not represent critical historical junctures in any "true" sense, however defined, but they certainly alter the social and economic context sufficiently so as to provide the perspective and variation needed to infer their effects on what is otherwise commonly presumed to be an uninterrupted, progressively linear derivation of productivity and productivity growth.

Shifts in the social meaning of productivity could have been approached differently by attempting to understand *when* the idea of *being productive* first found resonance in societies. Max Weber, of course, wrote extensively about the construction of productivity as socially meaningful in his influential work, *The Protestant Ethic and the Spirit of Capitalism:*[14]

> The attempt has been made … in what are often judicious and effective observations, to depict economic rationalism as the salient feature of modern economic life as a whole. Undoubtedly with justification, if by that is meant the extension of the productivity of labour which has, through the subordination of the process of production to scientific points of view, relieved from its dependence upon the natural organic limitations of the human individual. Now this process of rationalization in the field of technique and economic organization undoubtedly determines an important part of the ideals of life of modern bourgeois society.

Weber, then, is claiming that productivity became socially meaningful during the development of modern bourgeois society, marked by rationalized processes of economic organization. Implicitly, Weber is arguing that being productive, or working more efficiently to produce more, is not a natural feature of humanity, but a construction that corresponds to a society in which "traditional" beliefs as organizing principles had been eclipsed. In a modern society, to offer a broad, and perhaps crude, interpretation of what Weber may be implying, individuals no longer engage in something for the sake and intrinsic value of that undertaking; rather, individuals engage *in order to* arrive at a goal, whether that be measured by productivity or by some other gauge of "success."

[14] Max Weber (1992), *The Protestant Ethic and the Spirit of Capitalism,* New York: Routledge, p. 36.

The issue of *when* productivity became valued as greater output per input invested is not explored. The reference to Weber in this introduction, as well as in subsequent chapters, serves, importantly, as a reminder that productivity *had become* a central societal value; it was not always so. Bearing such in mind helps place contestation of the "modern" productivity discourse, as is evident in public debates, in perspective. Contestation in the public debates, in both France and the United States during the twentieth century, did not focus on the largely accepted definition of productivity and its key promise as "social rescue" and the production of "more"; contestation during this time instead concentrated on distributional issues. Weber simply takes us a step further back by suggesting that "productivity as rescue" is an artifact of social organization, not a time-honored and inevitable tenet of social and economic organization. It is this latter claim that first permits us to explore the proposition that meanings attached to productivity may be more yielding and fluid than what is commonly taken to be the case. This dissertation covers the twentieth century, when productivity was accepted as a common sense term and was made measurable by adopting the simple productivity formula, output per input invested. The analysis makes the wager that discernable shifts in meanings attached to this seemingly "unambiguous" formula would lend greater support still to the claim that productivity corresponds better to social values than incontrovertible laws of economic science.

Why is the research of any import?

So what and why should we care? At one level, whether or not productivity, defined as output per input invested, derives from immutable laws of science or the minds of individuals is irrelevant. The definition serves as a rudimentary economic indicator, a concept that abstracts from a complex reality, to become useful as a gauge and guide of economic success and organization. Scholarly research, however, is not predicated on the idea that what is considered to be ordinary and limited in its reach should be disregarded as uninteresting to parse and explore in order to make better sense of our world. Scholarly research is precisely rooted in the ethos of taking nothing for granted; sometimes what seems to be ordinary can be extraordinarily revealing in terms of how we understand outcomes.

Statistical series appear ordinary. As noted, numbers do not explain or negotiate; numbers are quiescent, providing benchmarks, only. In fact, statistical series are not ordinary, but extraordinary in their organizing potential; productivity growth statistics have long played out as powerful triggers of policy initiatives in both France and the United States. During the late 1970s and early 1980s, for example, when legislators in both countries were debating innovation policies, productivity growth comparisons were frequently made with Japan, then being framed in both countries as an emerging competitor. The numbers make the call.

In a recent paper by the National Bureau of Economic Research (NBER), productivity growth and levels are compared for France, Japan, the United Kingdom and the United States during the twentieth century.[15] As was noted during the late 1970s debates, Japan's average total factor productivity growth was calculated at 5.1 during 1950-1973, with the UK posting an average rate of 1.5 and the US, 1.8;[16] for the time period of 1973-1980, the rate for Japan drops to .9, while for France, the UK and the US the rates are 1.8, .5, and .1, respectively. From 1980 to 2006, the rates for France, Japan, the UK and the US are 1.3, 1.0, 1.1, and .9, respectively. [17] Interestingly, in this paper, average annual growth rates over the time period 1890-2006 for France, Japan, the United Kingdom and the United States are 1.6, 1.8, 1.0, 1.6, respectively.[18] The numbers show an equalizing trend.

If the dissertation were challenging the accuracy of productivity and growth statistics as a way of querying their sense, listing them in the introduction as a way of illustrating any point would be a curious exercise. The dissertation does not question the sense of attempting to measure abstracted concepts, but seeks to expose how they are used as gauges and what meanings *become* attributed to them. Clearly, competitor countries look for growth trends in other countries to assess their relative position and performance. The

[15] Gilbert Cette, Yusuf Kocoglu and Jacques Mairesse (December 2009), "Productivity growth and levels in France, Japan, the United Kingdom and the United States in the twentieth century," *NBER Working Paper Series, Working Paper 15577,* Cambridge, MA: National Bureau of Economic Research. This paper can be accessed at: http://www.nber.org/papersw15577
[16] Ibid., p. 36
[17] Ibid., p. 31
[18] Ibid., p. 30

numbers cited during French and US debates during the late 1970s suggested that Japan was racing ahead;[19] no one, or at least no legislator participating in these debates predicted that the trend would stop. Countries began looking at the Japanese model in order to account for the accelerating performance. The NBER authors suggest that Japan's success can be attributed to a catch-up effect, following the end of World War II, and further speculate that some countries engage more successfully in this process than others. Differences in success rates are tentatively ascribed to education levels of the working population and institutional aspects, such as market rigidities.[20] It is noteworthy that this preliminary assessment does *not at all* square with the clarion calls for increased R&D investment and innovation-promoting policies during debates on how to address declining productivity growth rates in both France and the United States during the late 1970s. China, note, was never mentioned in the debates.

Policy errs. More specifically, policy errs, depending on how we define the desired outcome. During the twentieth century, productivity growth provided a key gauge of economic success, relative to other countries, as though productivity growth were a zero-sum game. No normative assessment is offered as to whether this gauge was optimal, misleading or adequate, given a world of imperfect information and measurement tools at our disposal. This dissertation attempts, merely, to expose the limitations and *decisions made* that numbers hide, particularly in relation to the power they wield. Such does not discredit the effort to make and perfect the measurement, nor does it trump the feat. This dissertation is written, with full acknowledgement of its own limitations and import. As the writer Adam Gopnik notes, "… one of the more obvious banalities of seeing everything as a social construction, the ultimate postmodern vice – is that it vastly underestimates the difficulty of *doing* things, as opposed to thinking about them."[21] The intent of this research is not to invalidate social constructions, or statistical constructions, for that matter – a fact or feat of social organization – but precisely to think about them, attempt to understand what these

[19] From the statistics documented in the NBER paper, the perception would appear to be caused by the enormous differences in productivity growth rates between Japan, the UK and the US in the lead up to the mid-1970s. Japan looked to be accelerating at a phenomenal speed. The numbers need not be parsed; what matters is that the rhetoric of falling behind Japan was sufficiently in both France and the US to motivate major legislative moves in an attempt to address the *perceived* deficit.
[20] Ibid., p. 19
[21] Adam Gopnik (2011), *The Table Comes First: family, France, and the meaning of food,* New York and Toronto: Alfred A. Knopf and Alfred A. Knopf Canada., p. 47. Emphasis in the original text.

constructions imply about ourselves, the meanings we attach to them, as well as to discern how they unleash their force. We need both: the doer and the critic.

This research should challenge those who argue that productivity is an unambiguous concept, evidenced by the raw math of its measurement.[22] Concepts that appear simple, but in fact play a prominent role in the construction of economies, invite, or should invite, further questions, such as those offered at the start of this introduction. Was it inevitable that productivity came to be valued in this way? Does the definition, as given, reflect social values particular to a point in time? How do we define output? How do we define input? Does the way in which we conceptualize the source of surplus and growth shift over time and if so, what are the implications? In an interview, Robert Lipsey remarked that, "… what proportions of output you attribute to inputs is not that clean of a concept." In the same interview,[23] he suggests the way in which productivity contributes to a better way of life, "… really relates to what goes on in the minds of people." These two statements, together, and from an economist, who had devoted much of his professional career to the study and modeling of productivity, lends support to the claim that productivity represents something to which we have *decided* to attach value.

To summarize, the research seeks to disabuse common perceptions that productivity is a concept rooted in essentialist properties, a scientific notion that was destined to guide the construction of our economies in a particular way. Challenging this presumption need not be viewed as taking deconstructivist license to criticize the intellectual work and intelligence invested in developing the idea of productivity. To paraphrase the thoughts of Robert Solow, all models are wrong, but some are more useful than others.[24] Productivity models have provided a pragmatic way to think about economic organization and growth. Models, though, often become mistaken for representations of "truth,"[25]not abstract representations of the concept they are purported to capture or measure. Hence, the goal of the research is not to laud the Luddites

[22] A distinction should be made between productivity indicates and parametric approaches to its measurement. The latter makes model assumptions clear, while the former does not.
[23] The interview with Robert Lipsey took place on July 19, 2010.
[24] In an interview with Robert M. Solow on March 10, 2011.
[25] Robert M. Solow expressed this thought in the March 2011 interview, more specifically with regard to the Cobb-Douglas production function. See chapter 12, pp. 441-442 for this comment.

or the anti-globalists, or any group, for that matter, that challenges the status quo without delivering alternatives. The research aims to provide a check on the way in which we attribute essentialist and common sense properties and laws to concepts that are, fundamentally, constructed to reflect our social values. In so doing, we might be better able to understand the mechanism through which ideas spread and exert their force.

Dissertation chapters

The literature review, chapter 2, frames the dissertation by breaking down the level of analysis from general principles of economic organization, such as the automatic triggers that precipitate legislative action; followed by general organizing factors, such as institutional configuration and ideational forces of action; and last, the specific organizing potential of a particular economic concept, productivity. In this way, the literature review provides a frame through which the effects of the discourse on productivity can be mapped from general to specific outcomes.

Chapter 3 provides an overview of theory and method. This chapter attempts to identify different research paradigms and how the ontological assumptions that underlie their respective traditions determine what might count as valid support of the claims made. More specifically, this chapter covers the analyticist tradition, which is best exemplified by the way in which economists abstract from a complex reality to present a "useful" ordering of facts.[26] This research paradigm also provides the ground rules for discerning shifts in social meanings attached to productivity by abstracting "implied meaning" from complex mathematical models of productivity and productivity growth.

When it comes to discerning the way in which ideas transfer from one "social location" to another, only wagers are made in this dissertation. In this dissertation an attempt is made to understand whether political elites react to competitive pressures in some sort of underlying structural sense, or if it is the *idea* of competition, or the rhetoric of competition, that persuades them to act. The former would fall in line with a

[26] Patrick T. Jackson attributes this methodology to the analyticist research tradition. See chapter 3 for a more complete discussion of this particular research paradigm and its importance for this dissertation.

critical realist view of the world, while the latter might better square with a reflexivist view of the world in which unobservable structural tendencies are nonexistent. This chapter also describes the methods adopted in attempting to answer these ontological and methodological questions.

The chapter to follow presents the scientific discourse on productivity. In this chapter key scientific models of productivity published in the scholarly literature during the last century in the United States are reviewed. This chapter is foundational, insofar as it attempts to discern shifts in the scientific meanings attributed to productivity, as a basis for changes in social meanings. Hence, this chapter launches the investigation, because the research is predicated on the assumption that ideas about productivity were seeded by the scientific community, and spread from this community to policy circles. Unlike the policy chapters, which principally cover two time periods during the last century, the scientific discourse chapter analyzes productivity models across the century. In this way, a more complete perspective is provided, rendering claims more robust by extending the study points of variation.

Chapters five through seven cover the policy discourse during the early postwar years, when the US emerged as a military victor and world power; war-devastated France was rebuilding its economy. In these chapters, the way in which ideas about productivity traversed the Atlantic is scrutinized. In addition, this chapter exposes the force of the discourse on productivity to effect policy change. Public debates provide the most straightforward source of rhetoric and reasoning leading to policy adoption. These debates also efficiently help discern which ideas cut across political interests, thereby counting as policy facilitators, and those ideas that block passage by failing to resonate across the political spectrum. The next three chapters, eight through ten follow a similar format but cover a later time period, the 1980s-1990s, when information technologies were beginning to transform work practices. The beginning of this time period also marks a break in the productivity data, when many industrialized countries, the US and France included, bore witness to declining productivity growth rates, compared to those being posted for new world competitors, such as Japan. Until the early 1970s, the economies of both France and the United States had experienced unprecedented growth and material prosperity. In this way, the two time periods provide an interesting

backdrop for comparison. The social context had changed for both countries, in similar ways, though their institutional configurations – the way in which their economies were organized – continued to differ. The two time frames offer a good level of variation from which to base inferences about causal mechanisms of change and the way in which discourse spreads.

The popular discourse, chapter 11, is covered for the same two periods, using one source, *Business Week.* Discourse is assumed to infiltrate and be reflected in different social locations; the assumption that scientific ideas about productivity would eventually become evident in popular business jargon is reasonable. But, more than evidencing the spread of discourse, the popular press facilitates comparisons between two periods of time. Every law under debate at any particular time cannot be analyzed; however, a complete issue of *Business Week* can. Moreover, this popular discourse, in a somewhat artless way, can be roughly coded in order to discern indicative trends precisely because the content is limited and the format of content presentation remained roughly the same at the two time points of study.

Finally, the conclusion not only summarizes the dissertation's key findings, but also presents the comments of three economists, Nobel Laureate Robert M. Solow, former head of the NBER office in New York, Robert Lipsey, and Erik Brynjolfsson, Schussel Family Professor at MIT Sloan School of Management. The work of these three prolific scholars figures prominently in the coverage of the scientific discourse, and interviews conducted with them provide a check on the interpretations of the scientific discourse as covered in chapter two. The exchanges help place the findings of the dissertation in perspective, granting the final word to those, who promoted its development and proliferation.

In fact, during the course of the interview conducted with Erik Brynjolfsson, he described the source of productivity in a way that bears reflection. Improvements in technology, he explained, account for the largest source of productivity growth, with these improvements described as, "… new ways of combining atoms in different ways."[27] Perhaps the comment is a *productive* note with which to end this introduction

[27] The interview was conducted on August 11, 2011. For a complete reference of this quote, see chapter 12, p. 456.

and launch the inquiry. In physics, the *Law of Conservation of Energy and Matter* suggests, in plain language, that something cannot be created from nothing. When thinking about the productivity discourse, we might consider the idea that all decisions involve opportunity costs at some level.

Chapter 2: Literature review

Today … no one is against markets. The only legitimate questions are: What are their limitations? Can they go wrong? If so, how can we distinguish the ones that do from the ones that don't? What can be done to fix the ones that do go wrong? When is some regulation needed, how much, and what kind? More broadly: how to protect the economy and society against specified tendencies to market failure without losing much of either the capacity of a market system to coordinate economic activity efficiently or its ability to stimulate and reward technological and other innovations that lead to economic progress?[28]

Robert Solow

Overview: economies and organizing principles

Robert Solow defends the relevance and victory of market systems, but not their invulnerability. Markets fail, and permanent prosperity has proven elusive for all economies; history interrupts. This dissertation exposes the way in which productivity as an economic concept and organizing principle is called into action as a way either to address threats of decline or spur growth. This aim must first be framed within a more general consideration of *how market economies are organized.* Do markets automatically discern threats and challenges through some intrinsic corrective mechanism, and do they then self-regulate? Alternately, do institutional configurations determine the response to any particular alarm signal or can ideas alter an economic course with greater force? This literature review proposes to look at each of these general propositions as a way to place a specific organizing concept – productivity – within a broader frame of scholarly theories addressing economic organization.

Automatic corrective forces

How economies are protected from market failure is a subject long debated by scholars of political economy. The theories of two scholars in particular – Karl Polanyi and Albert O. Hirschman – address the issue of economic distress in ways that can be linked to a general conceptualization of productivity as a crises manager. For Polanyi, progress came at the expense of social upheaval: survival could be secured only by "protective counter moves" in response to vast disruptions in social organization following, for

[28] The quote is taken from an article appearing in *The New Republic* (January 12, 2010). See http://www.tnr.com/article/books-and-arts/hedging-america

example, the rapid growth of industrialization.[29] Because survival was at stake, these moves were called to order nearly reflexively. In a similar way, Hirschman describes an intrinsic survival mechanism, "slack," or that which sits in reserve to compensate in times of social or economic failure. In fact, Hirschman notes that slack is a natural, intrinsic element in this world, being reproduced continuously, " … as a result of entropy, characteristic of human, surplus-producing societies."[30] Like Polanyi's "double movement,"[31] "slack" is available essentially automatically: decline activates its enlistment.[32] Decline is inevitable, and so is its attempted defeat. Entropy speaks to a world made of laws and patterns. And, here, for both scholars, so does social response.

The fact that Polanyi and Hirschman theorize about automatic mechanisms of rescue does not implicate either as an essentialist, or theorists that ground their reasoning in the assumption that market economies are a given, locked onto a predetermined organizational path. Polanyi writes about the "fiction" of labor, land and money being fashioned as commodities, to be bought and sold as though they were factory products.[33] What is inevitable, according to Polanyi, is this outcome *given* the introduction of what he terms, the "factory system."[34] But, the choice to introduce such a system based solely on self-interest[35] was that: a choice, from which the commodification of land, labor and money then became the "organizing principle."[36] Hirschman's conviction that economic organization is a choice is revealed in an article, titled: "Against parsimony: three easy ways of complicating some categories of economic discourse."[37] In this work, he references the *Exit, Voice, and Loyalty*, suggesting that the introduction of *Voice* for leaders – whether of firms or countries – as well as *Exit,* resulted in a myriad of theoretical complications to conventional economic inquiry, which later required still more thought (another book) to sort through. In the article, Hirschman aims to explore additional conventional (neo-classical) assumptions about consumer

[29] Karl Polanyi (2001), *The Great Transformation: the political and economic origins of our time,* Boston, MA: Beacon Press, pp. 78-80
[30] Albert O. Hirschman (1970), *Exit, Voice and Loyalty,* Cambridge, MA: Harvard University Press, pp. 14-15
[31] Polanyi (2001). See, for example, p.79
[32] Hirschman (1970), p. 15
[33] Polanyi (2001), pp. 78-79
[34] Ibid., p. 78
[35] Ibid., pp. 257-258
[36] Ibid., p. 79. This point is related to that made by Weber and discussed in the introduction on p. 10.
[37] Albert O. Hirschman (May 1984), "Against parsimony: three easy ways of complicating some categories of economic discourse," *Bulletin of the American Academy of Arts and Sciences.* 37:8, pp. 11-28

preferences (for example) to deepen the complexity further still. He then sets out to understand what the added complications share in common to provide clarity.[38] What is important to note in this work is that *Voice*, *Exit* (and complexity) are suggestive of agency and contingency: not a set pattern of inevitable outcomes. In short, we do not passively arrive at equilibrium.

Hirschman's theoretical frame directly challenges two central claims of neo-classical economics that, in turn, may be tested at another level by looking not at company – but country – performance. First, Hirschman challenges the neo-classical assumption that competition keeps firms operating at peak performance. If a decline in performance as measured through product quality, though, can move firms to seek improvement rather than simply perish, as claimed by Hirschman, could economic threats not move countries as well? International relations theorist Kenneth Waltz suggests that "structure selects" and liberally applies the market metaphor to explain the way in which the international system relies on "self help" as an organizing principle to eclipse under-performers[39] – precisely what Polanyi and Hirschman counter in their analysis of domestic economies. The question to be asked is: do countries possess slack in times of distress? How is distress gauged and what is required to avoid *Exit* (emigration in a literal sense) in terms of their survival?

Second, Hirschman queries neo-classical assumptions about the so-called *nature* of consumer preferences, changes to which are confined to variations in income and price. Hirschman believes that consumer preferences may also change at a higher level of individual consciousness – meta-preferences – that reflect a shift in values. For the latter, choices made are not merely instrumental, derived from cost-benefit calculations on the part of rational utility-maximizing individuals. Hirschman decides that values such as "striving and attaining" can define consumer preferences as well.[40]

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[38] Ibid., p. 12
[39] Kenneth N. Waltz (1979), *Theory of International Politics,* Boston, MA: McGraw-Hill, pp. 88-93
[40] Hirschman (1984), pp. 14-18

Both of these challenges to conventional assumptions made by neoclassical economics can be used as frames in the current analysis on productivity models. First, countries have long used productivity measures as gauges of economic success *relative to* other countries. When threats as evidenced by declines in these measures materialize, do countries react? Or, do they allow themselves be overtaken, or outranked, by healthier competitors? Like firms, whose drop in sales can under certain circumstances spur action, do countries confronted by a loss in prestige or relative ranking in terms of a standard of living also initiate change through *Voice* of leadership? Second, because productivity measures are directly based on consumer valuation, the question becomes: is this valuation instrumental and inevitable, or can changes be made in terms of what individuals value? If it is the latter, the analysis of productivity trends over time, perhaps across countries, becomes terribly complicated. How do these changes in consumer valuation that extend beyond price and income parameters become reflected in productivity measures, if at all?

These questions are intended to help frame the debate; this research does not aim to test the theories of Polanyi, Hirschman and Waltz through the analysis of productivity measures and their influence on country reactions. The larger theories here presented provide guidance in terms of how arguments will be focused, as well as offer a basis for comparisons at a broad theoretical level. For example, Polanyi uses the example of poverty coexisting with plenty as one indicator of economic distress – an alert for action.[41] In the case of firms, Hirschman points to revenue declines, resulting from diminished, or deteriorating, product quality and services sold.[42] Is the latter relevant on a country basis?

Curiously, Hirschman does take his analysis to the levels of state when, for example, he analyzes the trade-off, or "optimal mix" between *Voice* and *Exit.* For non-totalitarian nations, he posits that *Voice* trumps *Exit,*[43] though later, when considering the ideological origins of America, he notes its citizens are very much connected to the ideas of individual aspiration as a form of *Exit:* individuals move on to achieve

[41] Polanyi (2001), see, for example, pp. 87-89
[42] Hirschman (1970), pp. 3-5
[43] Hirschman (1984), pp. 120-121

higher social status; Americans do not attempt to alter their social status through group action (*Voice*).[44] Yet, in matters of government, Hirschman argues that Americans are loathe to use *Exit* as a form of dissent or call to action: Americans, Hirschman argues, practice a form of denial – this country, as a land of last resort for those seeking a new chance, *must be* "satisfactory."[45]

Here is yet another factor complicating the analysis. In a sense, Hirschman contradicts his original premise that "slack" is available to counter decline – a far more parsimonious proposition that becomes complex as new elements – such as the ideological origins of America – come into play. The arguments Hirschman levels are interesting and looking at the history of one country, and how change may or may not prevail in relation to social meanings is certainly a defensible exploratory path. But, in dealing with one country, perspective is obscured. Moreover, without a way in which to define decline and gauge reaction, the theory becomes difficult to validate. Any one of a number of competing hypotheses could just as well explain Hirschman's claim that Americans are bent on being "happy," no matter what the circumstance. The largeness of the country and its consequent *relative* imperviousness to country comparisons could well serve as one alternative. America's *relative* power ranking could be another: at the time of the article writing, America's stature in the world economy was not in doubt, though a slowdown in growth had been amply discussed in congressional hearings and among scholars.[46]

If we are truly interested in key organizing principles adopted to avert market failure, or address relative decline, comparative benchmarks that cross time and countries come to mind as one useful way to untangle the different forces presumed to be at work, whether they be institutions, ideas, competitive forces or a combination thereof. Productivity measures, or indicators of economic wellbeing and standards of living, serve this function well insofar as they have been compared over time and across countries. Moreover,

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[44] Ibid., pp. 106- 119. Hirschman note that the "Black Power" movement was an exception to this general "rule." See p. 112

[45] Ibid., pp. 113-114. In fact, Hirschman makes an argument for the development of institutions to help foster *Exit* strategies. See p. 119

[46] See, for example, Mancur Olson (1984), *The Rise and Decline of Nations: economic growth, stagflation, and social rigidities,* New Haven, CT: Yale University Press

productivity growth – producing more with less – speaks to the idea of "slack" and progress,[47] or well being, security, or simply raw survival; hence the relevance of Polanyi and Hirschman. If these measures hold some explanatory value in terms of changes in economic organization and how to secure survival, how do they do it? And, are measures automatic "self-help"[48] switches, or are they in need of operators?

Institutions and ideas: general organizing principles

Polanyi believes that crises seed the development of new institutions, "great and permanent."[49] But Polanyi is really arguing for the *freedom* of countries to create their own social structures in so doing, as opposed to forcing countries to adopt a uniform domestic system.[50] Diversity, in other words, was to be the world's safeguard against destructive competition deriving from a force-fit one model for all: neo-liberalism. Polanyi did not provide a theoretical frame in which to demonstrate how a global economy could accommodate different market systems. The varieties of capitalism literature did.

In the edited volume by Peter A. Hall and David Soskice, *Varieties of Capitalism: the institutional foundations of comparative advantage,*[51] theoretical frames are developed in order to explain how different institutional configuration leads countries to specialize in those industries for which their domestic institutions confer comparative advantage. This proposition on its own, at least in part and on the surface, would seem to provide a beginning theoretical frame to support market system diversity, or a way for the global economy to accommodate varying systems without inviting predatory behavior.

Hall and Soskice largely limit their diversity allowance to two typologies of market systems: liberal market economies (LMEs) and coordinated market economies (CMEs). In LMEs, most faithfully represented by

[47] In fact, Hirschman writes, "Recognition of this [the fact that decline is seeded in times of plenty] truth has been impeded by a recurring utopian dream: that economic progress, while increasing the surplus above subsistence, will also bring with it disciplines and sanctions of such severity as to rule out any backsliding …" Hirschman (1970), p. 7
[48] See chapter 3 and discussion on p. 64 of how "self-help" principles are relevant to the research at a theoretical level.
[49] Polanyi (2001), p. 259
[50] Ibid., pp. 261-262
[51] Peter A. Hall and David Soskice (2001), *Varieties of Capitalism: the institutional foundations of comparative advantage,* Oxford, UK: Oxford University Press.

the United States, firms organize along the lines of hierarchies[52] and markets, while in CMEs, firms are more likely to coordinate their activities through non-market mechanisms.[53] These institutional configurations, in turn, confer comparative advantage by making some industry specializations more likely than others: "In any national economy, firms will gravitate toward the mode of coordination for which there is institutional support."[54] As a broad summary example, Hall and Soskice explain how institutional characteristics such as competitive markets and ready capital predispose firms to engage in "radical" innovation, while coordinated markets, relying on cooperation and patient capital are more likely to invest in "incremental" innovation.[55] Firms in the United States, then, would be more likely to develop nanotechnology than machine tool innovation, while the opposite would be true for Germany – according to theory.

In fact, Hall and Soskice attempt to support their claims by presenting patent data (specialization by technology class) for both Germany and the United States, taking two years as data points (1983-1984 and 1993-1994).[56] Hall and Soskice write that, "The striking finding is that Germany specializes in technological developments that are just the reverse of those in the USA."[57] Certainly, the US is shown to win a proportionately higher number of patents in information technology for both years, compared with patents in machine tools, while in Germany the proportion of patents being won for information technologies is less than that for machine tools, although pharmaceuticals, polymers and nuclear engineering – as some examples – hold a higher share of patents than machine tools.

The snapshot picture of the data – at two points in time – is not striking. The data exhibit enormous variance between the two years, which is not explained in the text. A more relevant analysis would be one that assessed the changes between both points in time: what accounts for the shifts? Was legislation passed that may have provided incentives to innovate in particular fields? (It should be noted that European

[52] Hierarchies in this volume are noted to be corporate structures. Ibid., p. 14
[53] Ibid., p. 8
[54] Ibid., p. 9
[55] Ibid., pp. 38-39
[56] Ibid., pp. 42-43
[57] Ibid., p. 41

countries did look to the Bayh-Dole Act for guidelines in amending their own patent laws, following a time lag.[58]) Or, does the variation convey erratic patterns in innovation, typical of such a process? Moreover, attributing patents to technology categories may be misleading: many of the industry sectors characterized by what is termed "incremental innovation," such as machine tools, may incorporate so-called "high technology" (e.g., new materials, information technologies) as inputs to their production. Finally, more recent data show Germany in fourth place, after the US, Japan, and South Korea for nanotechnology patents[59] – an impressive placement, given the size of the country compared to the United States. Given the importance being placed on this category of technology by government worldwide, and governments of vastly different domestic institutions, the data at the very least call into question the idea that domestic institutional structures may encourage firms to specialize in particular industries.

The theory may be clean and compelling on its surface, but parsimony needs to explain something relevant in order for a compromised reality to be helpful. The question is: is it useful to classify economies according to institutional type? Hall and Soskice acknowledge that the two "ideal" types cannot exactly capture all economies: Japan and France are pointed out as examples, with firms from the latter more likely to seek state assistance than would be the case of Germany and the UK.[60] But the UK is already in a class of its own, compared with Germany, and particularly with regard to British firms' innovation strategies.[61] New typologies,[62] in fact, are being ever increasingly "discovered," which inevitably complicates the discussion. Japan and France, for example do not fit neatly into the LME/CME divide and political economy scholars such as Martin Rhodes have long argued that Italy, Spain, Portugal and Greece also

[58] France, for example, passed patent legislation following the model of Bayh-Dole in 1999. See chapter 10 for a further discussion on the Bayh-Dole Act.
[59] These data can be retrieved at: http://www.nanocleantechblog.com/2011/05/articles/patent/japan-s-korea-and-germany-lead-in-nanotech-patenting-for-nonusa-countries/ The data are posted for 2011. Note that Great Britain, a member of the LME club of "radical innovators," placed a distant eighth in these data. See Hall and Soskice (2001), p. 350 for a description of UK firms' innovation strategies.
[60] Hall and Soskice (2001), p. 35
[61] Ibid., p. 350.
[62] Typological theory is defined as, "… a theory that specifies independent variables, delineates them into the categories for which the researcher will measure the cases and their outcomes, and provides not only hypotheses on how these variables operate individually, but also contingent generalizations on how and under what conditions they behave in specified conjunctions or configurations to produce effects on specified dependent variables." Alexander L. George and Andrew Bennett (2005), *Case Studies and Theory Development in the Social Sciences,* Cambridge, MA: MIT Press, p. 235

represent a fourth type of advanced welfare state.[63] Institutional configuration, as it turns out, does not lend itself to neat categories. If the UK, for example, is described as a liberal economy, how does its National Health Service fit into the profile?[64]

The VoC literature has also been criticized for its lack of agency: in this literature, structure organizes and firms make decisions based on perceived advantages provided by these structures. How did these structures come into play? Walter Korpi dismisses the assumptions: "VoC assumes a causal ordering where employers' demand for asset-specific skills gradually leads to CMEs, something that in turn generates well-developed welfare states."[65] In short, Korpi emphasizes the need to gauge relative power positions of employers and employees – class relations – in order to discern an power-grounded, agent-oriented explanation of outcome. Korpi does credit the literature for having identified what he terms "clusters of production regimes," that serve to show CMEs are not "… bumblebees that cannot fly," but are viable competitors to LMEs by virtue of their institutional configuration.[66] Although Korpi presents this argument as one challenge to the assumptions of neoclassical economics,[67] he confines his analysis to the typologies, as givens. Employer power interests may explain how different welfare-state characteristics emerge, but the question remains: how useful is it to subsume diverse economies into such broad categories, conferring on them the illusion of a given, neatly tailored ordering? Change in institutional configuration could plausibly be sourced to other causes, such as foreign competition, for one.

In fact, globalization, however defined, has been covered in the literature as a challenge – or threat – to advanced welfare states and their particular institutional configurations. Although the VoC literature has been criticized as lacking an explanation for change, Hall and Soskice do in fact address exogenous shocks

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[63] The "fourth" refers to the standard "three," as characterized by Goesta Esping-Anderson (1990), *The Three Worlds of Welfare Capitalism,* Princeton NJ: Princeton University Press. The three are liberal, corporatist-statist, and universalist, described on p. 27. The grouping as suggested by Rhodes is discussed in a paper delivered to the Portuguese presidency of the European Union (no date given). See: http://www.unifi.it/relazioni-internazionali-studi-europei/upload/sub/Ferrera_Hemerijck_Rhodes.pdf p. 38.
[64] See qualifications to the literature in Richard Deeg and Gregory Jackson (2007), "The State of the Art: towards a more dynamic theory of capitalist variety," *Socio-Economic Review,* 5, pp. 149-179.
[65] Walter Korpi (January 2006), "Power resources and employer-centered approaches in explanations of welfare states and varieties of capitalism: protagonists, consenters, and antagonists," *World Politics,* 58:2, p. 204
[66] Ibid., p. 203
[67] Ibid., p. 203

on economies due to shifts in consumer tastes and technologies.[68] But firms are assumed to continue operating on a given principle: "We expect firms to respond with efforts to modify their practices so as to sustain their competitive advantages, including comparative institutional advantages."[69] This conclusion is challenged by Fritz Scharpf, who acknowledges that threats in the global economy may not affect all "types" of economies in like manner, but claims that economies tend to converge in terms of measures to be undertaken: "Under these [intensified international competition] conditions, all countries are under pressure to increase private sector employment, raise the efficiency of welfare state spending, and in particular reduce the employment-impeding effects of welfare state financing and welfare state benefits."[70] Although Scharpf refrains from abandoning the principle of diverse market systems, the overall mechanism of change, here, would appear to differ from that being directed by firms, whereby patterns of specialization should, in principle, obtain pre- and post-crisis.

Finally, Iverson and Wren attempt to divert attention away from globalization as the greatest threat to advanced welfare states by focusing, instead, on the challenges posed by the growing service economy.[71] Iverson and Wren do pattern their analysis on institutional configuration, remarking that different systems cope in unique ways to a new trade off between equality and employment expansion, a derivative of the service economy. Still, the authors speak to universalizing principles that strive to increase service sector *productivity* – here, the saving force dominating economic discourse during the 20th century, whereby prices fall and wages increase and prosperity returns.[72] Accepting that threats to different market systems will affect these economies in singular ways suggests a need for actors to come to the scene: be they governments, visionaries, or power interests. Stepping up productivity in the growing service sector requires *ideas about how to do this*: given institutional structures cannot self-reorganize to accommodate those ideas in a period of economic crisis.

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[68] Hall and Soskice (p. 62)
[69] Ibid., p. 63
[70] Fritz W. Scharpf (June 2000), "The viability of advanced welfare states in the international economy: vulnerabilities and options," *Journal of European Public Policy,* 7:2, p. 224
[71] Torben, Iversen and Anne Wren (1998), "Equality, employment, and budgetary restraint: the trilemma of the service economy, *World Politics,* 50:4, pp. 507-546
[72] Ibid., pp. 545-546

That institutions *shape* is an idea with currency for other groups of scholars, most notably the sociologist, Marion Fourcade. In her well-received book, *Economists and Societies,* Fourcade sets out to explore, "… processes whereby national institutional dynamics structure disciplines by reliably structuring the individuals who carry them out."[73] Fourcade studies the construction of the economics profession in Britain, France and the United States, mainly during the last century, and describes, meticulously, the processes whereby domestic institutional structures select and channel the way in which the economics field has developed in these three countries over time. This work enriches the current debate, not only by the way in which specific processes, as causal mechanisms, are discerned, but also because Fourcade's work focuses so intently on the economics profession: the construction of productivity indicators and their influence on economic organization provide a concrete test-case of her claims.

Fourcade claims that the discourse and practice of economics has become increasingly formalized and analytical during the last century,[74] a claim that begs interpretation: as a matter of linear progressive development (competing hypothesis), or as part of a constructive process, dependent on social meaning (main hypothesis) – Fourcade's premises her work on the assumption that "… *different societies create different types of individuals.*"[75] But, the main question to address here is: to what extent are domestic institutions cast in stone? If societies create individuals, do individuals, in turn, influence the reproduction of society? Fourcade maps out two ways in which "economic knowledge" are involved in the production and reproduction of "state forms": (1) economic ideas work through "societal projects" to create state structures and (2) these ideas, more broadly, actively form the economy.[76] The subtext to this analysis must be: institutions and ideas influence one another, a proposition that differs from her claim in the preface that institutions structure individuals.

[73] Marion Fourcade (2009), *Economists and Societies: discipline and profession in the United States, Britain and France, 1890s to 1990s,* Princeton, NJ: Princeton University Press, p. xiv.
[74] Ibid., p. 2
[75] Ibid., p. 14. Emphasis in text.
[76] Ibid., p. 29

The claim, however, that ideas form the economy makes institutional transfiguration possible – escape from predetermined patterns of economic organization. But, Fourcade, like many of the varieties of capitalism revisionist scholars,[77] is more intent on parsing differences in institutional structures that lead to variation in outcome. Fourcade, for example, contrasts the "independent regulatory agency" of the United States with direct state management as practiced in France. But she then notes the exceptions of price controls initiated by the US government during World War II and the industrial policy debates during the 1970s debated also at the government level.[78] The exceptions, it would seem, place in question the power of institutional configuration to dictate a particular policy path – not exactly Fourcade's argument – but the outcome begs the question that Fourcade sets out to answer: what role did US economists play in the development of these policy alternatives, if any? And, what was their effect on society? Similarly, Fourcade discusses the Sherman Antitrust Act and the way in which it unintentionally legitimized the development of concentrated corporations through mergers and acquisitions by effectively forcing firms to battle fierce price competition.[79] Again, the question becomes whether the law legitimized corporate power concentrations or whether economists as experts legitimized law passage. Fourcade's overarching theoretical argument, of course, is that institutions and actors co-configure society and each other in an ongoing process of production and reproduction. New Institutions may be created, or reconfigured, in response to legislative outcomes that have somehow misfired, impending market failure or social disequilibrium. But a call to corrective action requires agency of some kind and directed in a way that resonates with society – Polanyi's belief that nations should be free to choose their domestic system.

If true that different societies produce different individuals, it would be useful to study corrective actions of dissimilar societies responding to similar challenges. Fourcade parses institutional particularities, for example, in the way that research and university teaching is separated in France, citing the example of *CNRS*,[80] although she qualifies the claim by suggesting, "… intellectual divisions today do not map out

[77] Scharpf (2000), Korpi (2006), Iversen and Wren (1998)
[78] Fourcade (2009), p. 37
[79] Ibid., pp. 36-37
[80] *Centre National de la Recherche Scientifique*

perfectly on institutional ones, though they often *originated* there."[81] For the purpose of understanding the causal mechanism of change and transfer of ideas, it would be relevant to consider that French universities do conduct research, as in the United States, and that France adopted legislation in 1999 patterned after the Bayh-Dole Act, which effectively transformed US patents laws to encourage research collaboration between universities and private firms.[82] The United States, for its part, also supports public research institutes: the National Institutes for Health (NIH), for one. Fourcade, of course, is singling out the separation of research and teaching as one of several factors contributing to what she calls "fragmentation of the intellectual sphere."[83] And, she is also discerning the large and fine differences in societal structures that impose their effects on something, at first, as seemingly non-critical to societal organization, such as the economics profession. In her analysis, the links become apparent, and the way in which societal organization, or institutional structures, can become invasive, each part reinforcing the whole, is clear. She shows, most interestingly, how economics *becomes* the economy. In a sense, then, she is recounting the first part of the narrative: how these differences came about over *La Longue Dureé*. But, if mappings are imperfect and fragmentation is being addressed, then the argument that institutional constraints *shape* should shift to *shape and are shaped.*

Keen to show effects of disparate origins, Fourcade links the development of the economics profession with its relation to government administration. For example, she points out that US universities were in closer touch with the needs of public administration and responded quickly by institutionalizing technical training, which then created a pool of economic experts on hand to serve as consultants. In France, by contrast, Fourcade describes a post-war France with few technical resources and a relatively conservative university faculty "at odds" with reformist modernization plans.[84] Fourcade, though, then explains that an "*X-Crise* group" transformed a research center in 1933, the *Centre Polytechnicien d'Etudes Economiques,*

[81] Ibid., p. 253. Emphasis in text.
[82] Medical research at universities has long been carried out in collaboration with INSERM, a national health research institute, and a news piece from *The Australian* recently covered a new research university being built in the environs of Paris to rival US universities – reportedly in response to France's best university being ranked 40th in the world. See http://www.theaustralian.com.au/higher-education/france-builds-a-world-beating-research-university/story-e6frgcjx-1225871262182 . The Bayh-Dole Act is described in greater details in chapter 10.
[83] Ibid., p. 253
[84] Ibid., pp. 203-204

which was then mandated to developed more mathematical and technical economic expertise. She adds, "This technocratic ideology in French administration and industry fused with a certain reverence for 'American' management methods, technical competence, and social science, which after the war diffused though the powerful channels of US influence in Europe (e.g., American foundations and the Marshall Plan administration)."[85] The key agent of change, from this passage, would seem to be ideas: different ideas create different societies.

Fourcade stresses the authority conferred on economists as experts in determining how economies should be organized. Fourcade argues that, in the United States, economists became professionalized on the basis of a "skill monopoly."[86] Certainly, the increasing mathematical complexity characterizing the discipline over the course of the 20th century lent legitimacy to economics as a profession. But esoteric mathematical formulas do not make for compelling arguments, winning divisive policy debates: numbers do. Part of the legitimacy of the profession and its mechanism to create change *must* work through numbers that have acquired social meaning. This idea – that numbers organize – has been amply addressed in the literature.[87]

Fourcade's focus on how different societies create different economists is somewhat surprising, given an earlier article written, "The construction of a global profession: the transnationalization of economics."[88] In this article, Fourcade uses the 1970s as a breakpoint to argue that the internationalization of the economics profession has transformed its dynamics.[89] Economics is particularly prone to globalizing forces because it requires no license, such as medicine, but enjoys widespread legitimacy, due to the appeal of its rhetorical appeal of abstract reasoning, its conversion to a politically empowered technology and through *US*-

[85] Ibid., p. 204
[86] Ibid., p. 61
[87] See for example, Alain Desrosières (1998), *The Politics of Large Numbers: a history of statistical reasoning*., (Translated by Camille Naish), Cambridge, MA: Harvard University Press.
[88] Marion Fourcade (July 2006), "The construction of a global profession: the transnationalization of economics," *American Journal of Sociology,* 112:1, pp. 145-94. In fact, Fourcade alludes to forthcoming work that focuses on the particularities of different, nationally based and institutionalized forms of the economics profession. Ibid., p. 158.
[89] Ibid., p. 147

dominated international links.[90] Fourcade argues that such these links, crossing national boundaries, confer legitimacy on economists to "reconstruct" societies based on "economic ideology."[91]

An element is missing in this causal process, however. Legitimacy may be the engine of movement, but what's the piston? Fourcade comes closer to this level of analysis when she describes different isomorphic diffusion processes: competitive, coercive and normative. Although she subsumes professions under the latter category, drawing from the work of Meyer and Rowan,[92] the competitive process should be scrutinized further as a possible mechanism through which economic ideas spread and take root. Economics is a profession, but it is also an organizing institution: what economists produce become legitimate signs around which economic activity can be set in motion. Do norms provide the incentive to act, or competition? Or coercion? This research attempts to answer the question by looking at a particular economic construct: productivity measures, which should help better discern which powers are at work and through which process outcome is achieved.

Fourcade cites the work of Mark Blyth when considering the influence of institutional structure on the way in which economic ideas and economists become important movers of (and barriers to) policy passage.[93] Fourcade claims that knowledge production in the field of economics is closely linked with the needs and demands of the state: so, for example, French economists are credited with expertise in the pricing and management of public goods, which stems from the country's tradition of industrial planning, while in Britain, scholars of welfare economics, such as Marshall, Hicks, Pigou and Sen, are claimed to have grown out of a liberal state concerned about its commitment to the underprivileged.[94] Here, institutional structures have a hold on ideas.

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[90] Emphasis added. Ibid., p. 156. This latter point supports justification for focusing on the US scientific discourse on productivity.
[91] Ibid., p. 157
[92] John W. Meyer and Brian Rowan (1977), "Institutionalized organizations: formal structure as myth and ceremony," *American Journal of Sociology,* 85:2, pp. 340-363. Fourcade is also careful to delineate the limits of isomorphism, chiefly the way it brackets the effects of the diffusion process itself to aid in construction and favors situating isomorphic processes into a broader frame of "global logic." Ibid. pp. 153-156
[93] Ibid., p. 25 and p. 176.
[94] Fourcade (2009), pp. 25-26

Blyth's referenced work, *Great Transformations: economic ideas and institutional change in the twentieth century,* does consider the way in which institutions and ideas influence each other, but the work is really investigating a more specific causal mechanism, clearly evident from the book's title.[95] Early on in *Great Transformations*, Blyth makes the case for sequencing.[96] Only by understanding what leads to which outcome, can causal variables be discerned – ideas, according to Blyth, come first, and exert independent causal force. To explain why this obtains, Blyth challenges the theoretical underpinnings of both historical institutionalism and rational institutionalism. For historical institutionalism at its most basic reading, ideas require pre-existing institutions in order to be grounded and acted upon;[97] for rational institutionalism in raw form, ideas have no place, because actors are assumed to make choices based on exogenously determined preferences, which they maximize using a cost-benefit calculus.[98] Neither provides a forceful explanation for change, nor the mechanism through which these institutions came to be in the first place. Blyth argues that both suffer from faulty logic and self-limiting constraints. For example, Blyth queries if new ideas require a particular (historically dependent) institutional format and structure in order to succeed, how transformative can they be? How can they explain change?[99] Likewise, how can rational actors design institutions based on a tally transaction costs not yet known?[100]

With institutionalism down, Blyth addresses the issue of interests, first by pointing out the tautology in declaring that any agent's choice reveals rational preferences because actors base choices on rational calculations.[101] He also refers to the work of Alexander Wendt, who argues that in order to have interests, an individual must first have an *idea* about why they have these particular interests; hence, the analytical

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[95] Mark Blyth (2002), *Great Transformations: economic ideas and institutional change in the twentieth century,* New York: Cambridge University Press.
[96] Ibid., p. 44
[97] Blyth references the work of Theda Skocpol and Margaret Weir (1985), "State structures and the possibilities for Keynesian responses to the Depression in Sweden, Britain and the United States," in Peter B. Evans, Dietrich Rueschemeyer, Theda Skocpol, eds., *Bringing the State Back In,* Cambridge, UK: Cambridge University Press.
[98] Blyth references his criticism, among others, to the work of Alexander J. Field (1981), The problem with neo-classical institutional economics: a critique with special reference to the North/Thomas model of pre-1500 Europe," *Explorations in Economic History,* 18.
[99] Ibid., p. 22
[100] Ibid., pp. 23-24
[101] Hirschman's objections to simplifying preferences based on instrumentality are also relevant to consider. See pp. 20-21 on this point.

focus should instead fall on "belief systems" and how they arise.[102] Such a theoretical reference, of course, brings ideas back to a first-cause in the sequencing order. One question that remains is: are interests the same as preferences? What happens when interests, even if they are based on belief systems, converge to form a solid block of power and become effective in terms of influencing outcome? At this point, do ideas do the explaining, or do power interests?

Blyth selects his two case studies – Sweden and the United States – on the basis of "most different" and "crucial" case criteria[103] and studies the processes of embedding and disembedding liberal institutions at two break points during the last century: 1930s and 1970s. In the typology conceived by Esping-Anderson, the United States represents the liberal economy paradigm, one that minimizes entitlements and ties benefits to "the marginal propensity to opt for welfare instead of work."[104] Sweden, on the other hand, privileges egalitarianism and decommodification of social rights across income groups.[105] Each "typology" is consequently characterized by different institutional configurations. By choosing two countries grounded in such different ideational and institutional configurations, Blyth effectively controls for the influence of institutions in situations where outcome for the two countries is similar. This method could be considered a first-cut ordering of evidence that proceeds through the logic of elimination. Other mechanisms could, in fact, be at work if not accounted for in the framing of *what* is "most different."

For example, if social democratic Sweden – a near single-party country during the course of the last century – makes a concession to neo-liberal ideas and transfigures entrenched institutional structures to accommodate a newly resonating idea of neo-liberalism – would ideas not be credited with causal powers? Such would be Blyth's general argument. What though, if the progressive acceptance of these ideas coincides with slow economic growth? Does causation reside with the contagion of ideas – here,

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[102] Ibid., p. 29. Blyth references Wendt's work from, Alexander Wendt (1999), *Social Theory of International Politics,* Cambridge, UK: Cambridge University Press.
[103] Ibid., pp. 11-12. "Most different" cases study selection criteria follow Mills' Method of Agreement, whereby the outcome is the same, whereas all but one of several independent variables that could be causal are different; the variable that is similar for both cases, through a process of logical elimination, thereby becomes the hypothesized causal independent variable. See George and Bennett (2005), pp. 153-160. A crucial case is one that must "closely fit" theory to be considered valid. Ibid., pp. 120-121
[104] Goesta Esping-Anderson (1990), p. 26
[105] Ibid., p. 27

neoliberalism – or does causation have something to do with recession and economic crises? Blyth would no doubt explain that an idea about neoliberalism, as a saving force, must have first gained legitimacy before institutional change could take place. But, then the question becomes: is there not something more fundamental than ideas: how do countries know that they are in decline and by what gauges?

Blyth captures this notion by referring to a more abstract phenomenon, which he terms "Knightian uncertainly," defined as "… situations regarded by contemporary agents as unique events where the agents are unsure as to what their interests actually are, let alone how to realize them."[106] The first question, already asked, is how agents understand that they are facing Knightian uncertainty. The second question relates to how agents interact with the social context and how the latter influences decisions made. *Great Transformations* is a densely textured text, situating agents in a particular context, facing sets of *perceived* constraints. For example, Blyth notes that Rehn-Meidner model[107] in fact worked to weaken class solidarity among the Social Democrats by effectively transferring displaced workers from private firms operating at lower ends of productivity levels to public-sector employment.[108] Weakened class unity, in turn, led to new white-collar unions, or groups, whose "… *perceptions* of their interests ran contrary to the solidarity wage policy…."[109] Then came power considerations within the Social Democratic party. And here, ideas about how Knightian uncertainty could be addressed – the Rehn-Meidner model – in the face of presumed inflationary pressures places ideas first in the line of causal order. But once these new union groups became established, was it their perceptions about their interests or the fact that they had power to wield, as a group, that motivated the Social Democratic Party to regroup? Does having an idea about which interests to have include an idea about how one's socio-economic position relative to others may threaten their wellbeing? In other words, where does competition fit into the construction of ideas?

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[106] Blyth (2002), p. 9
[107] Gösta Rehn and Rudolph Meidner, two economists affiliated with the Swedish Trade Union Confederation, *LO* (*Landsorganisation*), sought to replace voluntary wage restraint with a more orchestrated policy designed to counter wage-based inflationary pressures during the prosperous postwar years. The model includes (1) restrictive fiscal policy, based on profits caps (2) a solidarity wage and (3) labor-market policies intended to help reintegrate workers displaced in the market by firms achieving higher productivity levels. Ibid., see pp. 119-123
[108] Ibid., p. 123
[109] Ibid., p. 123. Emphasis added.

I propose to look at these mechanisms of change from a "shop-floor" perspective, whereby economic indicators – here productivity and productivity growth – are singled out as policy movers, or gauges through which decline and revival are perceived. Blyth's work is critical to this study because it shows a clear first-causal order of ideas when agents confront Knightian uncertainty, or threats of decline. This study posits that competitive pressures from cross-country comparisons provide the cues that alert countries about the *perceived* need to react – the ways in which countries react reflect ideational notions of how to address decline. Economic indicators, generally, are posited to act as benchmarks that gauge a country's relative failure or success – productivity measures provide one test case to examine how these mechanisms drive policy.

This dissertation further explores the proposition that productivity measures are not based from essentialist properties, but are constructions reflecting social meanings that shift over time. Whether these meanings stem from ideational notions without regard to domestic institutional configuration is tested by looking at the force of productivity measures to move policy forward in France and in the United States. By selecting countries with ostensibly disparate institutional structures – France as an elite-directed statist economy and the United States as a paradigm of the liberal economy – Blyth's claim that ideas exert great organizing power can be further examined at a more micro level: the role of constructed economic indicators.

Productivity: a specific organizing principle

The fixation with productivity is not new. Scholars have looked at the way in which the conception and measurement of productivity have influenced policy and its relationship to institutional order, particularly in the United States. The historian Charles Maier, for one, is notable for the way in which he exposes the power of the concept to legitimize policy initiatives. In his book, *Recasting Bourgeois Europe,*[110] Maier premises his work on the notion that European class structures and institutional configurations demonstrated formidable staying powers throughout the crises-ridden twentieth century. Although Maier

[110] Charles S. Maier (1975), *Recasting Bourgeois Europe,* Princeton, NJ: Princeton University Press.

professes to concentrate his work on "… the process of stabilizing institutions under attack,"[111] he also stresses that new institutional orders arose following World War I. More specifically, Maier describes new and evolving power distributions, which he identifies as corporatist: labor's system of bargaining became incorporated into state structures, while lines between the public and private sectors eroded.[112]

Maier's work does not delve into the mechanism of change, nor does he square the outcome – institutional reconfiguration – with his premise that such structures proved to be secure. The main outcome of change, nevertheless, is clear: power interests in Europe were not interested in brokering revised social rankings, but instead pushed for a new industrial order based on technocracy: corporatist relationships would be negotiated through productivity gains, not elites, per se.[113] What made this outcome possible – articulated by Maier as the *politics of productivity* – was the fact that an essentially bourgeois society had prevailed over Nazi occupation.[114] It would seem more accurate to describe this process as one whereby new ideas – the politics of productivity – were grafted onto institutional structures that had survived two World Wars, but could not thrive as new ideas in their old guise: supposedly steady structures were becoming transformative.

To understand the mechanism of change, it is important to understand the role of the United States following World War II and look to see how new ideas took hold: through force or the contagion of ideas? To answer this question, Maier's claims have to be parsed. Maier asserts, for example, that the United States, finding itself in the position of a hegemonic vanquisher following World War II, sought to "thrust" its policies onto Europe.[115] Specifically, Maier writes that the US attempted to influence Europe in three major policy areas: new monetary arrangements and trade agreements; foreign aid; and the political economies of Germany and Japan. While it is not quite clear from Maier's account how the productivity

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[111] Ibid., p. 8
[112] Ibid., pp. 9-11
[113] Ibid., pp. 12-13
[114] Charles S. Maier (Autumn 1977), "The politics of productivity: foundations of American international economic policy after World War II," *International Organization,* 31:4, p. 630.
[115] Ibid., p. 619. As Maier notes, "In the last analysis, the means of exercising hegemony may be as critical as the fact of dominance itself: the architects of the American-sponsored international economic order exerted a gentlemanly persuasion." Ibid., p. 631

discourse influenced the first goal, it seems that, at base, a philosophical rift prevailed between Treasury and Marshall Plan officials, with the latter advocating expansionary, Keynesian policies, and the former a more restrictive path – something was needed to help bridge the divide.[116] Maier's central argument pivots around the idea that a more neutralizing argument was needed to speed policy passage forward. What is clear from the analysis is that the *politics of productivity* – more for less – played a central role in terms of crossing divides, particularly when it came to foreign aid commitments, and these arguments, surely, whether directly or not, spilled into other policy areas: Europe needed to increase its productivity to secure world stability; a productive Europe would be one that could not only eventually support itself but repay its debts. Economics, in fact, trumped the fear of communism. According to Maier, what ailed Europe was not the impending threat of a communist takeover, but a weakened economic engine.[117] Were Cold War politics on the minds of policymakers? Surely they were. What has to be read implicitly in the work of Maier is that agreement on economics – production – provided the mechanism through which policy initiatives were framed and passed. How can one legislate against communism? As Maier notes, "… at least the Marshall Plan allowed American liberals to endorse an implicitly anti-Communist aid program on the older grounds of economic assistance."[118] Arguably, economics provided "neutral" measures.

These arguments helped form the legitimizing ideas that made US engagement possible. But how were these policies to take root in Europe? Maier asserts, "The influence that Washington exerted through foreign aid in most of Europe could be imposed directly in the two societies that would later form the strongest building blocks of the Western economy along with America, specifically Germany and Japan."[119] Does foreign aid force countries into specific policy arrangements? An argument could be made that the US was in a position to coerce these two countries on several levels following their surrender. Yet, Maier later notes that the politics of productivity thrived in these two countries – was it the *idea* of productivity, or the forced imposition of policies upon which foreign aid was conditional? In fact, Maier

[116] Maier notes, "On the one hand, United States regulators pressed Britain to renounce its special protection for the pound and for its trade … On the other hand, credits did come through and the American demands were repeatedly modified in practice." Ibid., p. 622
[117] Here, Maier refers to a working paper produced by George Kennan and staff, regarding western European aid, published in 1947. Ibid., p. 624.
[118] Ibid., p. 624
[119] Ibid., p. 27

relates testimony of German industrial and banking leaders, suggesting that wage restraint was the chief contributing factor to the high growth performance of the post-war German economy.[120] Did the trade unions embrace the idea that wages should be linked to real productivity gains, only, in order for the collective whole to benefit on an ever-expanding basis?

Maier does not speculate. But, he inadvertently addresses the issue when he discusses the French post-war labor movement.[121] During 1947, for example, the Marshall Plan was said to have effectively split communist from non-communist labor confederations in France: non-communist groups were forming their own journal, *Résistance Ouvière,* changing its title to *Force Ouvière*[122] (the switch in language is notable). Although Maier then writes about the way in which the United States sought to influence the political affiliation of trade unions through cash, for one, he later states that the resulting divide was achieved through the economic reasoning of recovery. More pointedly, he asks, "… what men of good will could legitimately reject the concept of assistance to stimulate investment and production?" [123] Essentially, Maier is here betraying the mechanism of change by suggesting French labor unions *bought the idea.* The notion that foreign aid can coerce nations into patterns of action, particularly over the long term, has no currency.[124] That nations can buy into ideas does. Maier, as a historian, may not aim to explain causal mechanisms of change. That the logic of his arguments tends to support this claim, whether intentionally or not, is noteworthy.

Still, in order to test the counter proposition that French lawmakers and interest groups, such as labor, in fact felt coerced into a particular policy path, public debates must be examined. Do lawmakers and representatives from labor accuse the government of adopting policy to ensure continued foreign aid, or do

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[120] Ibid., p. 628
[121] And, looking at France is, arguably, a sturdier test case for the claim that *ideas can't be bought* because France was not subjected to postwar (externally imposed) constraints to the extent Germany and Japan were. As such, it can be considered more of a "least likely" case.
[122] Ibid., p. 625
[123] Ibid., p. 626
[124] Stephen Walt has explored this issue as it relates to alliances in Stephen M. Walt (1987), *The Origin of Alliances,* Ithaca, NY: Cornell University Press, pp. 236-242. His explanations, especially those that consider domestic obstacles to (essentially) buying loyalty or a commitment to a foreign-directed plan of action are relevant to consider for this case, as well.

they, on the contrary, suggest that France must be on board either to be competitive with the United States, or simply because they believe that the *politics of productivity* will promote prosperity and wellbeing for France? Although "motivation" can be problematized,[125] concerns that are publicly expressed must count as evidentiary.

The question to be addressed is: which causal mechanism does the heavy lifting in terms of explaining policy change at the national level. Maier suggests that the *politics of productivity* was a resounding success: economic growth and higher standards of living in Europe can be traced to the dominate role played by the United States and its subsequent influence on European economic policy. To infer this, he asks the counterfactual: "Might the progress of reducing inequality within the United States as well as Europe not have been faster or surer without the quarter-century of economic domination?"[126] Maier essentially answers this by suggesting that the lack of dissent indicates that societies, as a whole, did benefit from US foreign economic policy – not an overly forceful argument: individuals must be cognizant of missed opportunities, or alternative scenarios. Maier does not look at productivity as a constructed economic and social indicator.

Counterfactuals, of course, imply causality, as a necessary condition: without the politics of productivity, prosperity and wellbeing would have been less than what it was without the focus on productivity-enhancing policies. This dissertation does not attempt to answer the question as to whether or not the global economy would have been in a lesser state, without the neutralizing and forceful policy rhetoric of productivity – such is likely to entrap the analysis into a normative argument (needed first: a definition for "lesser state"). Still, Maier's assertion must be addressed: if productivity is a concept with a technocratic, essentialist meaning – it could be presumed that the economy automatically selects for technologies that are most efficient, unless, of course, power interests divert decisions for their own benefit, not for the collective whole.

[125] See discussion on the problem of singling out "motivation" as causal, in chapter 3 on p. 83.
[126] Maier (1977), pp. 632-633

This issue is the subject of David Noble's book, *Forces of Production: a social history of industrial automation.*[127] Noble concentrates his argument on a notion he terms, "technological determinism," whereby, "… technology has come to be viewed as an autonomous process, having a life of its own which proceeds automatically, and almost naturally, along a singular path."[128] Noble seeks to discredit this view by writing an historical narrative of automation in three key industries: aircraft, electronics and machine tools.[129] His goal: to demonstrate how the development of automated technologies is most clearly explained by institutional and personal power interests, not efficiency in its purest form, nor for the idea of efficiency.

Underlying these arguments is Noble's assertion that a prosperous United States, following the end of World War II, effectively became a "war economy," fueled by Cold War politics and the sprawling, deepening power of the military-industrial complex.[130]Everywhere in Nobel's narrative are formidable power structures, serving to channel outcomes. For example, Noble cites a report to the European Productivity Agency by economist Seymour Melman, who accused the US government of applying extraordinary pressures to step up production expansion, that costs, not efficiency, soared; moreover, as the largest customer for the machine-tool industry, the Department of Defense allegedly dampened the industry's price sensitivity. Melman later outlined these complaints in an article, titled, "Profits without productivity."[131] Unless large barriers to entry characterized the machine-tool industry – and there may well have been – high profit levels would, normally, invite new competitors. Noble does not address this issue.

Noble does point out that memories from the Great Depression generated a competing discourse on technology, with Americans then expressing doubts about the ability of technology to deliver secure employment and prosperity for all. But, war and victory had cast scientists back into the limelight of heroic stature, catapulting them into the role of "… the advance corps of a self-serving postwar cultural offensive."[132] If so, it follows that power interests could thereby secure legitimacy and begin to orchestrate

[127]David F. Noble (1984), *Forces of Production: a social history of industrial automation,* New York: Alfred A. Knopf
[128] Ibid., p. xi
[129] Ibid., p. 5
[130] Ibid., p. 5
[131] Ibid., p. 9
[132] Ibid., p. 10

outcomes that served their own interests. How? Nobel suggests that scientists' exclusionary knowledge about "matter and energy," and the ways in which they can be combined for further ends, confers social power. Social power, in turn, provides access to still more resources – in particular, the owners of capital and government agencies – which then seals the relationship: "… technical people strive continuously to anticipate and meet the criteria of those in power … they tend to internalize and even consciously adopt the outlook of their patrons, an outlook translated into professional habit through such mechanisms as education, funding, reward-structures, and peer pressure."[133]

The analytical frame veers on the claustrophobic and could ironically be called a close relation to the "technological determinism" that Nobel is so careful to discredit – it would not be hard to find exceptions that cannot fill this frame: the Nobel Prize in chemistry for 2011, as one example, went to the Israeli scientist, Daniel Schechtman, whose discovery about the nature of solid matter in 1982 resulted in a fierce battle with research fellows, the loss of his position with the research group and exoneration only decades later after his work was proven correct; all along the way, he continued to defend his discovery.[134] In this instance, it would seem that "preferences," extend beyond rational cost-benefit analyses. Here, a choice was made to bear costs, with no guarantee of reward, perhaps reflecting a "meta-preference" for striving, per Hirschman's conceptualization – as one possibility.

Such examples may be anecdotal, but they are sufficiently strong to warrant caution in terms of placing too many structural constraints on political, economic, and "technology" actors. To address these claims in a more rigorous manner, however, it is useful to consider the ways in which Nobel describes institutional empowerment in conjunction with the development of new technologies, as well follow the development of a particular technology used in automation – numerical control (N/C) – which Nobel details with care.

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[133] Ibid., p. 43. This argument is similar to that made later by Ted Hopf, when he suggests that international relations scholars failed to predict the end of the Cold War, because institutional powers and philosophical orientation – such as funding organization and academic curricula – were geared to support the Cold War apparatus. The reasoning, implicitly, suggests that no one was free to ask the "right" question: *When will* the Cold War end? See: Ted Hopf and John Lewis Gaddis (Autumn 1993),"Getting the end of the cold war wrong," *International Security,* 18:2 pp. 202-210

[134] See, for example: http://www.bloomberg.com/news/2011-10-05/technion-s-shechtman-wins-chemistry-nobel-for-discovery-of-quasicrystals.html

First, it is clear that established, powerful institutions were enlisted to help with the government effort to develop technologies that were deemed critical to the Cold War effort. But, what is also clear is that the mandate of these institutions shifted over time, as needs continued to evolve. For example, the Office of Scientific Research and Development (OSRD) was a main channel through which government contracts were awarded to non-governmental agencies and universities. OSRD became the organization encompassing an earlier agency, the National Defense Research Center (NDRC), the creation of which was heavily lobbied for by former MIT dean, Vannevar Bush. Bush, who was also the co-founder of Raytheon and the director of AT&T, presided over OSRD during the Manhattan Project, and is, according to Noble, credited with conferring civilian control over military research.[135]

What can be made of this? Institutions are powerful – they support extraordinary nation-changing operations, such as the Manhattan project. Still, individuals direct these operations. Nobel writes that, "In 1940, 70 percent of government research took place in government facilities; by 1944 70 percent of it was being performed in non-government facilities – 50 percent by private firms and 20 percent by university personnel.[136] These changes trace to an individual, Vannevar Bush, who was well connected with government, industry and academia. It is hard to discern how a shift in the way research became thereby newly institutionalized could really be attributed to static structures: the "fact" of the Cold War did not mandate one institutional form or another; it did not name players.

Nobel claims that ORSD administrators, because they themselves came from established institutions, tended to favor like institutions as partners – where work could be completed "expeditiously."[137] To favor is to choose. If sequencing is an important determinant of causality, then it would seem that agency precedes structure in this case – here a least-likely case, because the Cold War is considered to be a

[135] Noble (1984), p. 10-11.
[136] Ibid., p. 11
[137] Ibid., p. 11

calculated game with high stakes; yet, individuals made choices. Were alternative choices available? It would be difficult to serve up an argument suggesting that government was obliged to engage with civilian society. On the contrary, the Cold War was, first and foremost, a government project. Any invitation for civilian society to participate in these institutions – the military, for one – was exactly that: an invitation.

From institutional empowerment, came resources, for sure. Nobel writes about a new research culture that took root at MIT, how "… a military orientation, and an indulgent policy of performance at any cost had become an attractive new way of life."[138] Decisions, then, are made and either new institutions come into play or old ones become refashioned to serve new mandates. Do institutions then take on a life of their own, ordering events to come and, in this case, the way that technologies develop into products?

Nobel clearly believes this to be the case and attempts to show this outcome by analyzing the development of N/C technology and how decisions directing its development deviated from the politics of productivity, or efficiency, per se. For Nobel, productivity was a political ruse; power interests better explain outcome, not the logic of efficiency, per se, and he details the way in which inventor and industrialist John T. Parsons becomes pitted against MIT as a way of driving his point home. Parsons, then, represents the efficiency-minded entrepreneur, looking to develop N/C as a technical solution to an aircraft-manufacturing problem, with MIT scientists portrayed as careerists, aiming to design the highest-performing electronic control system.[139] In other words, what is considered to be highest performing does not equate with cost efficiency.

The development of Parson's technological prowess is richly detailed and concluded to have delivered a system requiring less labor and sundry inputs, while delivering greater accuracy and multiple additional qualities.[140] The inference is: Parson's indeed developed the technology model most likely to represent the outcome that markets would normally and *inevitably* have selected, but Noble is keen to show the actual

[138] Ibid., p. 11
[139] Ibid., p. 96 and 113.
[140] Ibid., pp. 96-103

outcome deviated from what market equilibrium would have predicted. The narrative recounted, though, suggests that Parsons, lacking capital to enter into a joint-venture with IBM, in fact forged a "joint engineering agreement' with IBM. Parsons was to use resources from a hefty contract won from the US Air Force. Seeking more resources to build the system, Parsons hired Robert H. Marsh, an MIT attendee, who suggested that Parsons contact MIT and tap into their resources. This decision, according to Nobel, completely altered Parsons' preferred course, as MIT – so goes the narrative – appropriated the project for ends of its own device: "MIT's insistence upon its own technical definition of the project – encouraged by Parsons' initial deference and reinforced by evolving Air Force objectives – created serious managerial problems for Parsons and paved the way for the shift in institutional control."[141] Parsons was ousted.

In this analysis, productivity may well have an essence (here, presumed to be "cost efficiency"), but power interests – sanctioned by cultural norms – prevent the neutral and automatic development of technology embodying the calculus of productivity.[142] Power interests, then, construct technology development, not rational markets. That contingency plays a role in how and which technologies are developed cannot be doubted. But, a narrative whereby a new team manager allows less play time, or no play time, for a long-standing star player, to accommodate a changed game strategy that he thinks will score goals (thereby enhancing his own position), does not convey the same organizing mechanism as a general rule suggesting team managers always use their power to remake teams in their own image. If the first mechanism is at work, the star player can search for an alternative team, which appreciates his or her particular skills. If, on the contrary, the second mechanism is at play, then it is hard to understand how team managers would be able to recruit any talented players at all.

Perhaps the analogy is simplistic – or off. The argument really suggests that MIT scientists allegedly harbored ideas about their particular interests that conflicted with those of Parsons. Institutions are powerful, and so are ideas. Did a structural constraint prevent MIT scientists from choosing to develop a technology that would be less costly to develop and deliver higher power? The proposition is dubious.

[141] Ibid., pp. 104-105 and 113 (from which the quote is taken).
[142] Ibid. See discussion on pp. 144-145.

Noble insinuates that the government's new, loose contractual agreements with universities – in part because of the urgency of war – in some sense cultivated a culture of "anything goes," where previously, such institutions had been cost constrained.[143] Nobel later describes pressures from the US Air Force, for one, which forcibly shaped scientific goals at MIT, helping to marginalize Parsons.[144] Having access to generous funding does not necessitate one research path or another. The air force may have specified goals. It can be inferred that scientists, through their own exclusionary knowledge, would have been free to choose the process to be developed (not necessarily the outcome).

In fact, Nobel's key challenge is less about scientific, institutional control than an attack on neo-classical assumptions of capitalism. Nobel specifically charges that the owners of production forces – capital – do not seek profit maximization through efficiencies, but domination over labor.[145] In order to illustrate this point, he develops a densely detailed narrative of how the General Electric Corporation (GE) both manufactured N/C controls and incorporated them in its own manufacturing processes. The narrative is flawed because although Noble wishes to show that GE did not maximize profits, he begins by stating that GE saw N/C as a way to enhance its prestige, as well as reduce labor costs – run-of-the-mill capitalist goals, even if the outcome turned out differently.

In this narrative, Noble attests that GE made the mistake of trying to follow "Taylorist" principles of deskilling the labor force and deepening managerial control, which then provoked labor, effectively thwarting success. All along, the company goal was to run N/C in a cost-effective manner, defined as savings gained per unit cost per part produced, relative to the capital investment made: "N/C was deployed … in the belief that they would led inescapably to greater productivity and profits."[146] The long and short of the extensive narrative that followed is: workers resisted. Wage rates were set low, with GE mangers assuming that "monkeys" could run N/C.[147] It would seem that the real theoretical issue is not that GE

[143] Ibid., p. 11
[144] Ibid., p. 113
[145] Ibid., pp. 321-322
[146] Ibid., pp. 266-267
[147] Ibid., p. 270

managers attempted to step up profits and treated workers as though they were lesser beings. The issue is that wages were set, based on managerial assumptions and goals, not productivity gains, as the scientific discourse on productivity would have predicted.

When the math did not work out, and it was clear that labor resistance would not abate, GE managers attempted to devise programs aimed at improving worker motivation, essentially by integrating them more fully in the entire production process.[148] Noble suggests that the program was found not to provide adequate benefits (however elusively measured), compared with costs totaling $800,000. Justification for program closure was thus at hand; unions protested. Noble shows that the program was, in fact profitable, but the measures used to make the calculations were faulty – in other words, and even supported by an analysis published in *Business Week*, the program was scrapped because it proved too threatening to groups in power. As such, profits were sacrificed for power.[149]

Noble summarizes the way in which capital inevitably dominates labor in four points, including, for example, the idea that participation programs create a core of elite, co-opted workers, thereby weakening labor organization, as well as the notion that such programs enable management to learn from workers, now off their guard, and use such information to optimize production further still, thereby eliminating the need for empowered workers.[150] Rather than being a threat to management elites, then, it would appear as though the profitable program empowered them, further still. With such a contradictory reasoning trajectory, the identification of *power as causal* seems problematic. The evidence that GE managers were motivated by power and not profits is not there – neither does Noble explain how to separate the two concepts.

Both Marxism and neo-liberalism are self-limiting by their teleological moorings. The idea that power abuses is not at issue – it can and does and not always. But, the idea that power abuses in a particular and

[148] Ibid., see pp. 276-279
[149] Ibid., pp. 320-321
[150] Ibid., pp. 318-319

patterned way is a contentious issue, and Noble does a disservice to his argument by suggesting that markets fail to reach equilibrium because power interests are obstructive – sometimes they are, sometimes they are not; power interests are not obstructive in a predictable manner.[151] The problem with conceptualizing social constructions, such as technologies, as a product of power interests is simply that the mechanism does not get to the *root cause of the construction*: how we value productivity and the meanings we attached to it, does. In this work, Noble equates productivity with efficiency. It would seem that GE managers did likewise, as did Parsons. Whether or not management abused its power at GE is not nearly as interesting, nor causal, as the fact that different interest groups equally participated in a social discourse on efficiency – based from the idea that more would then be available with less and for all. *That* is the mechanism at work: this fact drove Parsons and it drove, as unintentionally argued by Noble, GE managers – it also drove the unions, who understood that production efficiencies did not translate into higher wages, or better quality work conditions, as the concept of productivity had promised. That economists lent legitimacy to the benchmark – output/input – may implicate them in a far more substantial way than the GE managers, regarding the outcome achieved. The counterfactual to be posed is: what would the outcome have been had an alternative conception of productivity, or success, gained legitimacy? Note that Parsons' system would have required less labor than alternative systems; GE, sometime after becoming the market leader in N/C technology, announced that the "factory of the future," would showcase industrial automation, replacing half of the (hourly) workforce with robots.[152] The narrative is not about power interests, as claimed; it is more defensibly about ideas – ideas about how to achieve productivity gains through cost minimization – and how these ideas may fail.

If Noble attempts to capture the failure of markets to clear (on the basis of efficiency) at the micro-level, Robert Collins provides the historical overview narrative detailing macro-level dynamics in his work, *More: the politics of economic growth in postwar America.*[153] In this narrative, Collins exposes the

[151] Korpi's analysis of power interests more pointedly looks at the relative power of different groups – by admitting that the relative power of different groups can shift, he effectively allows for variation in outcome. Korpi (2006).
[152] Nobel (1984)., p. 323
[153] Robert M. Collins (2000), *More: the politics of economic growth in postwar America,* New York; Oxford University Press.

legitimizing power of growthmanship – the politics of expansion – as a new organizing principle in the postwar US "neo-corporatist" economy.[154] Much like the policy rhetoric on productivity, the discourse on growth was predicated on the notion that more would be available and available for everyone. Poverty could be battled without raising taxes, workers could expect higher standards of living, while business could count on an ever-expanding consumerism, and lawmakers had a clear scientific benchmark against which to gauge policy success.[155] Like productivity, growth worked for each interest group.

Benchmarks are critical to the narrative told. Collins writes about the way in which policy elites from the Council of Economic Advisors (CEA) were divided over the theoretical bases of many policy initiatives, but were united on the central importance of gathering statistics, and presenting them in their reports – statistical series focused on national incomes measures by demand category and long-term GNP projections, for starters. Collaborating with the National Bureau of Economic Research (NBER), these series became the driving force of policy initiation. This legitimizing force helped fire the spread of institutions newly mandated to produce statistical series[156] – in other words, the *idea* of growthmanship fostered institutional spread and empowerment.[157]

Similar to disagreements that simmered among economists (as well as policymakers and politicians) regarding the source of productivity growth, as well as its "true" connection to economic growth, overall, growthmanship and how to secure it generated intellectual rifts among the same group of elites. Not only did elites dispute, among themselves, the direction of causality – economist Leon Keyserling[158] advocated growth as a source of price stability, whereas President Eisenhower viewed price stability as a requisite for growth, for one – but the value of growthmanship was also disputed. Economist John Kenneth Galbraith, for example, cautioned that growth, measured in quantities, had to be gauged against quality of life indicators – it could nearly be considered a form of discourse contestation, or a "crack" in the discourse,

[154] Ibid., p. 21
[155] Ibid., p. 39
[156] Ibid., pp. 33- 36
[157] This sequencing – ideas leading to institutions – follow arguments made by Blyth (2002), as well.
[158] Leon Keyserling was the Chair of the CEA from 1949-1953 and served as a government advisor in other capacities as well. His congressional testimonies are covered in chapter 7.

opened up by a well-known Canadian, US-educated intellectual.[159] In this narrative, the conflicting voices of Lester Thurow, Paul Krugman, and Milton Friedman all lend support to Collins' claim that growthmanship enjoyed no consensus at the level of scientific theory.

It is, then, no surprise that US economic policies designed to promote growthmanship during the last century did not follow a linear or predictable path: policy directions, on the contrary, were characterized by breaks throughout the last century, and Collins is careful to relate these switch-points to changes in the social context. For example, Collins calls out the year 1968, as a turning point, when optimism about growth liberalism encountered clashes that grew with a poorly performing economy in the 1970s. Collins suggests that slow productivity growth and unfavorable demographics creating pressures on the employment market, and more, led to a reconfiguration of the discourse on unqualified growth to one that advocated "balanced" growth, which in and of itself, exposed the debate to further contestation: an MIT report titled, "The Limits to Growth," published in 1972 and linked with the Club of Rome, ignited discussion from pro-growth economists, such as Paul Samuelson, exposing the ever-widening splits among scientific experts. [160]

The division played out in the legislative arena. The Humphrey-Hawkins bill, designed to address economic ills by fueling demand – with Keyserling's support – experienced a fate not dissimilar to that of the Employment Act of 1946: when it came to President Carter's signing of the bill in 1978, it had been radically diluted. The final act did not guarantee employment, and it shifted focus from spurring demand to inflation control by stipulating price levels to be maintained within specific time frames. Collins also suggests that a renewed interest in indicative planning – industrial policy – also entered the debate, and was championed by Carter, but enthusiasm eventually fizzled.[161] All ideas represent – to borrow Blyth's terminology – responses to Knightian uncertainly.[162]

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[159] Collins (2000), p. 63
[160] Ibid., see p. 97 and pp. 129-130.
[161] Ibid., pp. 167-172
[162] Blyth (2002), p. 9

Enter: new ideas. Collins traces the building appeal of supply-side economics to the Kemp-McClure Jobs Creation Act of 1975, whereby demand-side policies became effectively superceded by the guiding principles of supply-side economics. In this act, the focus shifts to capital formation and tax cuts for corporations – all couched within a framework of growth.[163] The Kemp-Roth Economic Recovery Tax Act of 1981 revolutionized supply-side economics by extending the idea of "tax relief" to individuals; the voice of Milton Friedman, provided the scientific expertise required to close the book on Keynesian economics.[164] The question is: was Friedman first?

Collins claims that supply-side economics refocused the policy debate on productivity and the behavior of firms, as opposed to aggregate macro-economic measures that were traditionally deployed to guide and govern the economy. New taxes policies provided the conduit through which investment incentives would be delivered.[165] Collins does not address the possibility that productivity – like growthmanship – may be based on "dumb luck and inertia," as opposed to calculated science and proper policy implementation.[166] Moreover, he assumes that the new policy frames – *themselves* – were causal in switching the intellectual and policy focus from macro-economic indicators to firm-level gauges. Did the economists, who otherwise are credited with legitimizing the discourse on growthmanship, have anything to do with the switch? Collins is more intent on more generally exposing the way in which ideas are causal: "It is … clear that the supply-side movement was driven as much by ideological preferences, political expediency, and unquenchable optimism as by intellectual curiosity, scientific method, or empirical proof."[167]

The research aims to clarify the mechanism through which ideas spread and, in particular, to gauge the influence of economists, numbers, and more specifically, models of productivity in this process. The fact that Collins' work shows growthmanship to be a valid idea, successfully supporting both Keynesian *and* supply-side economics – but at different historical junctures – gives grounds for pause and reflection.

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[163] Collins (2000)., p. 175
[164] Ibid., pp. 179-181
[165] Ibid., p. 183
[166] "The record of US economic growth in the postwar period is hardly unimpressive, but it is unclear how much credit goes to the policymakers, how much to the innate strength of the world's largest capitalist economy, how much to dumb luck and inertia." Ibid., p. 238
[167] Ibid., p. 186

Collins quotes Keynes, who suggested that, "'Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist… Sooner or later it is ideas, not vested interests, which are dangerous for good or evil….'"[168] Collins does not entirely agree and argues that *vision,*[169] or that divorced from "fact," whether constructed or not, is what ultimately guides history. Keynes' remark is too constraining for Collins. Maybe. But, in order to better discern these quasi-competing claims, the mechanism through which an idea – or vision – spreads needs to be understood.

Early in his narrative, Collins describes the perceived Soviet threat in a significant way: "To American listeners, the threat was clear: The Soviet economy was growing faster than the American, enabling the Soviets to support a powerful military machine and making the Soviet system dangerously appealing to Third World countries looking for models to emulate."[170] It is a good starting point. A comparative study, such as that here proposed, may well provide the leverage needed to parse the mechanism at work. And more particularly, looking at the shop-floor mechanics of one particular economic indicator, such as productivity and productivity growth – how its social and scientific meaning shifts over time and its relationship to policy change – may be a *productive* way to get at a finer mechanism of policy and institutional change.

[168] This quote is taken from *The Collected Writings of John Maynard Keynes,* vol. 7, *The General Theory of Employment, Interest and Money* (London 1973), pp. 383-384 and is found in Collins (2000), p. 236
[169] Collins is using what he describes to be Joseph Schumpeter's notion of "Vision." Ibid., p. 237
[170] Ibid., p. 46

Chapter 3: Theory and method

Overview: statistics and the state

In 1952, Aryness Joy Wickens delivered a presidential address for the Annual Meeting of the American Statistical Association in Chicago. In the address, the economist and then deputy commissioner for the US Bureau of Labor Statistics (BLS) declared that, "… statistics in the United States have come to be used as determinants of private and public actions affecting the fortunes of millions of our fellow citizens."[171] She then went on to remark that, "No license is required to produce statistics."[172] Later in the text, the economist explains that the urgency of statistics became clearly apparent with the advent of World War II in order to aid resource allocation, as well as to support wage and price controls, but the mission waned after the war's end, only to be revived again for the Defense Program in 1950.[173] The link between numbers and policy was uncontestable. Wickens did not want the role of statistics to be diminished because of their far-reaching effects, often based on inaccurate measures, but was asking that a US statistical commission be formed and mandated to audit all statistical series used for public policy purposes. If statistics could trigger policy moves, then the public needed to understand their limits.

Support for the claim that statistics "… have been written into law as 'trigger figures,' determining automatically whether certain actions take place"[174] is much in evidence during postwar US Congressional debates. On August 4, 1950, for example, the Committee on Banking and Currency of the US Senate met to discuss an amendment to a bill aimed at establishing a system of resource allocation under the authority of the Defense Production Act. In this debate, Senator Fulbright[175] asks the committee and expert witnesses for assurances that President Truman would not be authorized to implement price controls, unless the

[171] Aryness Joy Wickens (March 1953), "Statistics and the public interest," *Journal of the American Statistical Association,* 261:48, p.1
[172] Ibid, p. 2
[173] Ibid, p. 3
[174] Ibid, p. 3
[175] James William Fulbright was a Senator (Democrat) representing Arkansas from 1945-1974. He was a representative for Arkansas from 1943-1944. http://bioguide.congress.gov/biosearch/biosearch.asp . Note: all biographical information in this and following chapters for US Congressmen will be taken from this site.

consumer-price index (CPI) reached a stated level.[176] How was the level to be determined? It was "inserted" at six percent, "somewhat" higher than a peak reading during the post-war period.[177] Later in the debate, the Chief of the Price Statistics Division from the US Bureau of Labor Statistics, Mr. Edward Hollander, is called as an expert witness and declares himself, "…to be in the unhappy position of making this index," only then to urge, "… I do not think it is a wise measure to put a mechanism like this, depending on that index or any other statistics of that sort, which robs both the President and Congress or America of the opportunity to write in standards for the criteria by which you invoke these very, very extensive powers."[178]

While during the 1950s legislators and experts in the United States were debating the extent to which statistics could grant extraordinary powers to the executive branch, the French were actively assembling statistics covering demographic, macro-economic and industry data for each region of the country with the aim of establishing national growth goals. In reports that refer to specific plans, numbers are commonly used as a rallying cry for government action, in the very name of state survival:

> We not only have to address our relative lateness, but also think about developments under way in foreign countries that will materialize in years to come. The United States, which has already doubled its output since 1929, is now set to double its output again within the next 25 years. The Soviet Union is set to increase its industrial production after its fifth five-year plan by 70%. Other European countries, together, have committed to the OEEC's goals, that is, growth in national output of 25% over the next five years.[179]

The numbers provide a spur to action. Indeed, it is hard to imagine how economies could be organized without them. What other plausible measure would have been available to compare France's economic outcome with that of its chief rivals, the United States and the Soviet Union? This is not to state the obvious, that numbers provide a gauge as to whether or not goals have been attained. The more important question to ask is, *how* were those numbers arrived at, and *why* did they become to be accepted as benchmarks?

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[176] United States Congress, United States (1950), Senate, Committee on Banking and Currency, *Executive Session,* Hearing, August 4, 1950, Washington DC: US Government Printing Office, p. 711
[177] Ibid., p. 711
[178] Ibid., p. 727
[179] France (1954). *Commissariat Général au Plan de Modernisation et d'Equipement*, *Projet de Deuxième Plan de Modernisation et d'Equipement: 1954-1957. Exposé de la situation et Exposé du plan* (no publisher information given), pp 14-15.

It could be argued that numbers as raw as aggregate output are "natural:" these statistics provide an indication for how much is available for the population at large. But, growth rates, unless they follow population trends (or some other "objective" parameter) are typically tracked relative to other states. Could a government pass a law based on an assumption that economies must grow in Europe by 25% over the next five years, because that number is intrinsically defensible? What might the goal have been, had no numbers from competitor nations been available? What exactly was the baseline in the Soviet Union, from which a 70% increase in output was to be achieved and how was it to be achieved at what cost? The numbers lend urgency to the challenge and provide targets. More a rhetorical device than scientific artifact, numbers, at any level, legitimize *forward* action.

Numbers, of course, enable policy. Following World War II, as an obvious example, the French government launched economic modernization plans, at the initiative of Jean Monnet.[180] Forecasts formed an essential part of these plans. The techniques employed to project growth rates were not so much based on the science of numbers and growth, but on policy options:

> In view of the time available and the calls being made upon the technical staff, and in view also of the unsolved methodological problem associated with such as task … it was decided to use only three variants, and to take as a criterion of choice the rate of growth of total output. The three growth rates analysed were 3, 4.5 and 6 per cent, corresponding to three types of growth—slow, average and fast—and they were chosen in order to illustrate the types of policy problem each gives rise to.[181]

As in the United States, where price controls were to be implemented at an "inserted" CPI target, policy options in France were linked to three growth rates, spaced by 1.5 percentage points and "chosen" by a "technical staff" with methodological issues. The issue is not so much the lack of water-tight rigor for a developing discipline based on probability functions, or the fact that any scientific basis for prediction was all but ignored by policymakers, but the extent to which the rough-cut and "chosen" figures triggered specific policy action.

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[180] Jean Monnet (1888-1979) was a French civil servant and credited architect of European integration. The modernization plans are discussed in greater detail in the chapters to follow, as is the history of the planning process in France.

[181] Hackett, John and Anne-Marie Hackett (1963), *Economic Planning in France,* Cambridge, MA: Harvard University Press, p. 120.

Public legislative debates following WWII in France also counted on numbers to guide action and fulfill national goals. For example, the French Assembly voted to nationalize the coal industry on May 17, 1946, but the manner in which the government was to organize and direct the industry became discussed long after; in these discussions, statistics framed the debate. In a session of the National Assembly on September 2, 1947,[182] pricing of coal and subsidies, the salaries of miners and productivity of the miners are tensely debated – at issue is the extent to which the government has responsibly carried out its mandate to improve the direction of this industry. Auguste Lecoeur[183] leads the challenge, citing a 62% increase in supplier charges versus an inferior increase in the price of coal of 12%; a fixed "total factor" productivity level of 25% in France as a whole, versus a 107% rate for coal miners; employment "indices" for miners ranging from 124 to 142, depending on the skill level, while qualified labor in metallurgy is cited at 170[184] – numbers that beg interpretation and verification, but numbers that do their work: following the debate, the Assembly votes to declare the situation one of "urgency" to be addressed by government action. Never mind the appeal by Radical party member, René Mayer,[185] who asked that coal prices be brought back to their "real level"[186] in order to restore economic health to the country. The idea of "real" cannot, in a legislative chamber, vie with *relative* prices and other competitive valuations – values that have no intrinsic sense apart from their ordering.

In the United States, statistics were used to no less an extent as guides to public action. Rather than nationalizing and consolidating an energy industry as the French were doing,[187] the Americans were on the defense, attempting to thwart what they saw as encroaching "centralism" in the steel industry.[188] During a

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[182] France (1947), *Journal Officiel, Débats Parlementaires, Assemblée Nationale,* September 2, 1947.
[183] Auguste Lecoeur, former resistance fighter, strike activist and high-profile member of the Communist Party in France, helped pass the law mandating nationalization of the coal industry, to become a single public corporation, the *Charbonnages de France.* Nationalization had been a key demand of resistance fighters following the war. For a summary of the nationalization process, see David H. Pinkney (September 1947), "Nationalization of key industries and credit in France after the liberation," *Political Science Quarterly,* 62:3, pp. 368-380
[184] Ibid., see pp. 4840-4842
[185] R. Mayer, leading member of the liberal, centrist Radical party, was (briefly) France's Prime Minister during 1953.
[186] Ibid., see p. 4847
[187] In the case of steel, it is argued, in chapter 6 that the French were attempting to consolidate the industry based on the size of firms documented for competitor countries, such as Germany, the UK and the US.
[188] United States (1950), Congress, Joint Committee on the Economic Report. *December 1949 Steel Price Increases.* Hearings, January 24, 25, 26, 27, 1950. 81st Congress, 2nd Session, Washington DC: United States Government Printing Office, p. 1

Congressional Hearing in 1950 on the recent increase in steel prices, Senator Joseph C. O'Mahoney[189] decries what he sees to be production and pricing control exercised by a group of private managers, as opposed to former times, when "… business and industry was conducted by individuals with their own capital and their own labor, and when a partnership represented the most complex economic organization that existed."[190] To underscore his point, he notes that eight companies produce 77% of all steel sold within the US, with United States steel accounting for 32.5% of ingot capacity, followed by Bethlehem Steel at 13.5 %, with figures being offered for the remaining top firms – all in an effort to spell "concentration" in numbers. Profits and prices are then linked to market share. At one point, Otis Brubaker from the United Steelworks of America declared that the government had estimated steel productivity to increase by 2-3% over time. The statistics, accordingly, become an automatic reference figure and aid Brubaker's charge that labor costs have not risen in like measure.[191] Politics were based on these and other figures, which later fueled fights and strikes and government action – numbers ignited the steel dispute during the early 1950s, and blame was parceled out according to the numbers.

The theory of numbers and the origins of the French state (Sidebar)

The "very extensive" powers implicit in the use of statistics to motivate state action were, of course, exercised long before US congressional testimonies in the 1950s and the initiation of the French modernization plans following World War II. A first function of statistics, in fact, can be traced to the consolidation of early states – indeed, although the exact point in time when the term, "statistics," gained currency is unclear from the literature,[192] it is agreed that the word originated in Germany as "*Statistik.*" "Statistics" first became an entry in the *Encyclopedia of Britannica* in 1797 and was defined as a "survey" being directly linked to governed territory.[193] In Latin, *status,* meaning *état, situation*, betrays its transitory

[189] Joseph C. O'Mahoney was a Senator (Democrat) representing Wyoming, from 1933-1960.
[190] Ibid., p. 1
[191] Ibid., p. 315-316
[192] In Theodore M. Porter (1986), *The Rise of Statistical Thinking, 1820-1900,* Princeton, NJ: Princeton University Press, the term is claimed to be first used in 1749 (p. 23), while in Jean-Claude Perrot and Stuart J. Woolf (1984), *State and Statistics in France, 1789-1815,* Amsterdam: OPA, ltd (licensed by Harwood Academic Publishers, GmbH), the first use of the term is traced to 1672 (p. 82). Both sources document the first use of the term in Germany.
[193] Woolf in Perrot and Woolf, p. 82.

nature:[194] it is a "situation," at any one point in time. Taken together, the etymology of "statistics" reveals their most critical function: to help construct a unified national economy that is based from a multitude of disparate elements. To count these elements and place them on a ledger declares ownership – the numbers *become* the state. In post-revolutionary France, this notion appears to fit:

> Unity was construed as uniformity, to be achieved by identifying and gradually limiting local differences. In its self-attributed role to direct the life of society, what more suitable instrument for the administration than the impartial and impersonal figures of statistics, particularly as society was regarded as having been reduced by the Revolution to its pure economic quality as an aggregate of isolated – and hence countable – individuals.[195]

It is widely acknowledged that the development of the "science" of statistics owes much to the French, particularly the mathematician Pierre-Simon de Laplace.[196] But more than the science itself, it was the collaboration between early French savants and administrators – and, in the beginning, mainly as it pertained to the advancement of agriculture – which moved the field forward to become a force in the organization of the economy. For example, Augustin-François Silvestre,[197] one of the founding members of the scientific group, *Société Philomatique de Paris* and influential in his position, regularly urged direct administrative action to improve the productivity of agriculture, through education, favorable land-leasing strategies, loan assistance and much more.[198] During these years, statistics describing the type and quantity and value of crops seeded, as well as costs of different cultivation techniques and returns accrued were central to these efforts and were drawn from detailed enquiries covering a majority of districts in France.[199]

Scholars trace the origins of modern statistics, seeded by these efforts to collect data, to Napoleonic France. The scientist and statesman, François de Neufchâteau,[200] re-founded the *Société* in 1798, and according to scholars, aimed to "perfect" agriculture and serve as a liaison to Government.[201] And, although mandated to complete a "statistical topography," covering all natural and industrial resources in France, the *Société* was

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[194] Porter, pp. 152-153. In fact, the true etymology of "statistics" is clouded: it is sometimes traced to the Italian word, *statista,* meaning "politician" or "statesman." Whatever the claim, the link to state and politics is clear.
[195] Ibid, p. 89.
[196] Pierre-Simon Laplace (1749-1827) was a French mathematician credited with a key role in the development of a statistical science.
[197] Augustin-François Silvestre (1762-1851), affiliated with the Bourbon dynasty, is mainly credited with founding the Société and popularizing science in general.
[198] Ibid, p. 111
[199] Ibid, see chapters 3 and 5.
[200] François de Neufchâteau (1750-1828) was also a poet and President of the French Assembly; he, like many of his peers, dedicated himself to the study of agriculture.
[201] Ibid, p. 109

subjugated to become, "…a quasi-official instrument of propaganda."[202] The politics of large numbers took root. With the department of statistics later appropriated by Chaptal's[203] Ministry of the Interior, the infusion of French government with scientists mentored during The Enlightenment is not to be overlooked. Otherwise stated, statistics, informed by the authority of seeming neutrality and objectivity, served to legitimize a government-directed organization of the economy. Statistics provided the "facts" from which to deduce the theoretical machinery of the state.[204]

These "facts," for example, included statistical matrices composed from vast surveys, sometimes on the basis of heterogeneous "scattered figures." But the task – that of developing a topography to know about "…men and things" – was carried out with zeal by Chaptal's successors in the Ministry of the Interior.[205] The initial efforts focused on population and statistics concerning the economy; by 1811, the mandate of the bureau, directed by Napoleon, extended to cover specific industries and, in particular, the factors of production and their waterway mobility.[206] The process for gathering information became increasingly meticulous; information checks were routinely carried out and technical processes became more finely parsed: "The distinction between subsistence and market sectors, the insistence on technical processes (both manual and mechanized), the specification of labour and raw material inputs … of mobility of goods and labour, and of market outlets, are characteristic of Coquebert's method of enquiry."[207]

A distinction must be made between data and statistical laws, of course. Much of the statistical topography alluded to during the late 19th century in France consisted of raw counts. But from these numbers, inferences were drawn, based on probabilistic reasoning. Concepts such as "*méchanique sociale,"* as

[202] Ibid, p. 110
[203] Jean-Antoine Chaptal (1756-1832) was a French statesman and scientist, who is credited with devising numerous practical applications of chemistry for agriculture and manufacturing, helping to create a modernizing industry in France.
[204] Woolf, chapter and Porter, p. 26.
[205] Woolf, see chapter 5.2.
[206] Ibid., pp. 136-137.
[207] Ibid., p. 140. Charles-Etienne Coquebert (1755-1831) assumed his position in the Ministry as the head of the statistical department in 1806.

advanced by the pioneering statistician and mathematician Adolphe Quetelet,[208] lent currency to the notion that social order could follow predictable patterns, as in the biological sciences. It is no small irony that this particular feature of statistics, its probabilistic element, generated a protracted debate in Europe regarding the deterministic message of "statistical regularity," and how it impinged on the notion of free will.[209] Significantly, whatever the concern of these early savants, the use of statistics during the 19th and 20th centuries appears more to have enabled human agency, by legitimizing action, than hold it hostage, per se.

Both Aryness Joy Wickens and administrators in Napoleonic France understood the power of statistics to organize economies. Both acknowledged, either implicitly or directly, the difficulty of providing accurate assessments. Aryness Joy Wickens, a scientist, wanted to expose the deficits. The *Société*, an instrument of the French government during Napoleonic France, contented itself with narrative construction. This dissertation aims to shed light on how the conceptualization of productivity shifted over time, as well as assess how these shifts influenced economic organization. Were they rough, albeit objective, guides for achieving economic prosperity, or were they the key components of a constructed narrative that produced unintended consequences? Before this question can be answered, the research program must be framed by the theoretical and methodological considerations that will help provide gauges of the knowledge claims to be made.

Methodological framework

Overview. This section outlines different ways in which ontological assumptions affect the way in which truth claims are evaluated. Because the research topic challenges conventional, essentialist notions of productivity, it stands to reason that an ontology supporting a representational reality, grounded in testable laws and patterns, is incompatible with the research project at hand. Instead, research paradigms that explore the causal mechanisms of unobservables, abstracted ideas and historical contingency *are* appropriate. In what follows, the works of four main theorists are assessed: Alexander Wendt, Kenneth

[208] Adolphe Quetelet (1796-1874), born in Belgium but influential across Europe, was reportedly troubled by accusations that his quantification of the human sciences was deterministic.
[209] Porter (1986), see discussion on pp. 162-177.

Waltz, Max Weber, and Antonio Gramsci. The ontological assumptions attributed to these theorists[210] are referenced, first, as examples that may be relevant for the present work. These theorists, secondly, argue for ideas that are directly and specifically relatable to the current research and, as such, provide theoretical support for discussions in following chapters.

Ontological orderings: "hook-ups" to the world. In his well-referenced work, *Social Theory of International Politics*, Alexander Wendt asserts the primacy of ontological groundings as the reason for why we observe what we observe.[211] Wendt delineates one major divide, that between rationalists and constructivist paradigms, essentially pitting Kenneth Waltz[212] against himself. As an overarching comparison, Wendt describes the rationalist view, which assumes identities and interests to be givens, or "… fixed objects that are in some sense outside of social space and time,"[213] and weighs this proposition against the constructivist view that actors are involved in a continuous process of producing and reproducing identities and interests. Rationalists would presume that states' identities and interests are exogenous to the international system, whereas constructivists would allow for preferences to be defined endogenously, with the caveat that a stable international system might not reveal differences, or change, or how such comes about for long periods of time; in such cases, Wendt suggests that little is lost by treating interests as givens.[214] The implications, then, require empirical substantiation.

Wendt avoids mapping basic ontological and epistemological divides – one onto the other – in direct correspondence, declaring his own idealist ontological position open to both science and understanding. He sums his key arguments as follows: "(1) that what really matters is what there is rather than how we know it (2) that science should be question- rather than method-driven, and the importance of constitutive questions creates an essential role in social science for interpretive methods."[215] Wendt does not explain

[210] The general framework for the different research paradigms here discussed is taken from Patrick Jackson (2011), *The Conduct of Inquiry in International Relations: philosophy of science and its implications for the study of world politics,* New York: Routledge.
[211] Wendt (1999), pp. 36-38
[212] Kenneth N. Waltz (1979), *Theory of International Politics,* Boston, MA: McGraw-Hill
[213] Wendt (1999), p. 36
[214] Ibid., p. 38
[215] Ibid., p. 40

why he sees no contradiction in, for example, Neoliberal regime theory,[216] but he serves up the example to illustrate that a particular ontological claim does not tie to any one epistemology, necessarily.

Wendt uses the concept of scientific realism as a way to frame his argument that ontology comes first, epistemology only a distant second, if relevant at all. Wendt assumes that the world exists independently of individual observers, and what is in the world may or may not be observable; societies, however, do not organize themselves in an evitable manner.[217] Wendt places empiricists and post-modernists in a similar camp of anti-realists, because the former does not acknowledge what our senses cannot observe, and the latter dismisses objective reality, altogether. Wendt insists, however, that both are what he terms, "common-sense realists": cats do not breed with dogs, and we all commonly accept this *fact*.[218]

Well, maybe. Wendt suggests that neither empiricists nor postmodernists ground "truth" – sense data for the former, relational meanings of mind and language for the latter – in an *external,* regulating reality.[219] As such, both groups "… privilege epistemology over ontology," a position Wendt believes to be challenged by, "our ability to refer to the same object even if our descriptions are different or change, and the resistance of the world to certain representations."[220] Resistance to certain representations, though, may materialize because a more "correct" representation of the world is discovered – a round versus flat earth – or new social meanings to the old representations take hold: the French Revolution, as one example.

Wendt acknowledges that examples of resistance are easier in *nature* than in society. But he persists: Montezuma chose to call the Spaniards "gods," which *was not reality*, and hence the vengeful destruction of his empire; the people had resisted. The construction had particular effects, but they were neither

[216] Here, Wendt is referring to the work of Friedrich Kratochwil and John Ruggie (1986), "International organization: a state of the art on an art of the state," *International Organization,* 40, pp. 753-775. The alleged contradiction refers to an individualist ontology, derived from a rationalist basis, paired with "regime," which implies an intersubjective epistemology.
[217] Wendt (1999), p. 51
[218] Ibid., pp. 52-53
[219] Ibid., p. 57
[220] Ibid., p. 57

inevitable nor predictable.[221] The question then becomes: are nature and the unobservables we typically discuss in political science – states, to take Wendt's prime example – to be ontologically ordered differently? To answer this question more pragmatically: are earthquakes more real than states? The answer is clear: both categories have effects, whether socially constructed or a *fact* of nature. And Wendt is correct to point out that postmodernists make references to social constructions; there is something, there. Postmodernists speak about states, *as if*[222]they had effects, even if states are no more than entities within a discourse, referenced through power structures.[223] Geologists speak about earthquakes, their causes and effects, and they refer to geological structures and calculable stresses, *as if* these forces had effects. Devising an ontological ordering based on whether we can observe states, leptons, earthquakes, or the sun rising and pigs that cannot fly does not advance knowledge on its own.[224] If change can be more easily or clearly explained in one of these categories compared to another, or if more sense can be made of the world in one "category" or the other, then drawing ontological differences between the categories does.

Wendt attempts to attribute explanatory value in unobservables by taking on the so-called "post-positivists,"[225] who are alleged to believe that social kinds[226] reflect ideas, whereas natural science is strictly materialist; as such, the two require different study methodologies and methods.[227] Wendt lists the

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[221] Ibid., p. 56. Patrick Jackson discusses this same passage, but uses the example to point out that Wendt fails to reveal *why,* through what philosophical assumptions, postmodernists altogether ignore why some representations succeed, and other do not; for Jackson the reason is because "knowledge" and the "world" are ontologically the same – postmodernists reject, out of hand, the notion of a dualist mind-independent world. See Jackson (2011), pp. 115-116.
[222] This use of the term, "*as if*" in this context differs from the discussion by Wendt, who refers to scientific modeling (economics) based on "*as if*" principles, which obscures theoretical musing about what *may* be so, from what actually *is.* Wendt (1999), p. 61. Here the term is used more to suggest that post-positivists do refer to entities, as though we all recognize of what these entities are composed. It is a post-positivist conundrum, loosely argued.
[223] Ibid., p. 55
[224] Jackson would describe this interpretation of ontology as, "scientific ontology." See p. 65 for further discussion.
[225] "'Positivist' versus 'interpretivist,' like 'quantitative' versus 'qualitative,' collapses all-too-easily into a difference of *method*, rather than a difference of *methodology,* and the key wager about our hook-up to the world made I more anthropological modes of knowledge-production is obscured." Emphasis in text. Jackson (2011), p. 36. Jackson, then, would take issue with the way in which Wendt splits the debate, suggesting that the *real* divide is traced to differences in philosophical ontology.
[226] Wendt differentiates "social kinds" from "natural kinds" in that they "… are constituted mostly by people's ideas, which seems to vitiate the subject-object distinction upon which the causal theory of reference depends." Wendt (1999),, p. 68. Wendt ascribed particular characteristics to "social kinds," most importantly for this study: "… social kinds are inherently relational – not in the sense of being caused by contingent interactions with other kinds (which also happens in nature), but in the sense of being *constituted* by social relations." Ibid., p. 71. More pointedly, "… there is no freestanding, prediscursive essence in virtue of which a witch is a witch, and thus no objective reality exerting a regulatory influence on our theorizing about witches." Ibid., p. 71
[227] Ibid., p. 68

ways in which social kinds differ from natural kinds, but counters that social kinds *can* be viewed, in some sense, objectively – the more forceful of which is the claim that material forces play a role in constituting social kinds and that self-organization, if in a relatively less important way compared to natural kinds, still presents in social kinds, albeit at varying levels.[228] Wendt lists pencils, made by humans, at the low end and states, constructed by shared interests, or more properly, interests, at the high end, which implies that this *construction* will be hotly contested and defended. In other words, a high level of self-organizing principles characterizes the latter. Wendt, of course, famously argued that anarchy is what states make of it,[229] but here, the way in which the argument is formulated suggests that states, at the so-called high end of the self-organizing principle, have a correspondingly strong element of "intrinsic" elements. Wendt speaks an implicit language of survival, and it is difficult to separate his argument, at least as here formulated, from that of Waltz and his theory of self help in the international system.[230] Wendt suggests that internal group dynamics work to ensure their survival. One difference between the two scholars may be that Wendt does not explicitly refer to power,[231] or a balance of power, and leaves open the possibility that new shared interests can be constructed as ordering principles. But it would seem, from the argument to be immaterial; it is hard to discern "process" in what appears here to be "structural."

In his earlier work, Wendt describes the mechanism through which states develop identities and interests. The mechanism is reinforcement; interaction rewards actors for holding certain ideas about each other and discourages them from holding others." [232] Wendt discerns processes. Does Wendt know this because he privileges ontology? Patrick Jackson has challenged this position on grounds that adopting an ontological stance *commits* the researcher or scholar to a particular account of what the world *is* and furthermore, once committed, the claim must then be evaluated epistemologically. How can we know that this account is

[228] Ibid., p. 72-75
[229] Alexander Wendt (March 1992), "Anarchy is what states make of it: the social construction of power politics," *International Organization,* 46:2, pp. 391-425
[230] Waltz (1979), p. 111
[231] In his article, as opposed to this particular passage, Wendt suggests that state security is a function of how one state views itself vis-à-vis the other – the "cognitive variation," which may be defined as realist zero-sum, neo-liberal competitive and individualistic, or cooperative – in the latter, national interests coincide with international interests. Waltz, according to Wendt, assumes a nature to states, unwarranted because security interests are viewed on the basis of "prior interaction." Wendt (1992)., pp. 400--402
[232] Ibid., p. 405. This postulation comes uncannily close to Waltz' claim that countries emulate best, more successful practices.

true?[233] According to Jackson, distinctions must be made between scientific ontology and philosophical ontology. The former begs the question, how do we know what we claim to be true, while the latter is more concerned with what Jackson describes as our "hook-up" with the world: how we produce knowledge, on what conceptual basis.[234] Wendt is charged with privileging scientific ontology over philosophical ontology.[235]

Jackson claims that critical realists, such as Wendt, "hook to the world" as mind-world dualists; "transfactualism" defines the relationship they discern between knowledge and observation. The latter suggests that processes can be discerned beyond the "facts."[236] Analyticists, such as Waltz, by contrast, "hook to the world" as mind-world monists; phenomenalism explains their view of how knowledge relates to observation: "knowledge … is a matter of organizing past experiences so as to forge useful tools for the investigation of future, as-yet-unknown situations."[237] In other words, of the different permutations available in a two-by-two chart, depicting monism/dualism and transfactualism/phenomenalism, Wendt and Waltz share nothing. And yet, both refer to self-organizing principles as a way to explain outcomes.

Causal processes. Wendt describes causation with three standard assumptions: (1) independently existing causal factor and outcome (2) causal factor sequenced before outcome and (3) the outcome would not have occurred, had the causal factor not been present. Wendt challenges the way empiricists may interpret an observable factor that is followed by an observable outcome as a correlative relationship only. The mechanism though which one causes the other is not observable; hence unknowable. Wendt believes that unobservable mechanisms are *real* and may be inferred as a best explanation.[238] Wendt argues that realists do exactly this when they describe, for example the causal force of nuclear reactions.[239] As if to preempt criticism for being too materialist in orientation, Wendt then claims that ideas, or norms, may be causal in

[233] Jackson (2011), p. 27
[234] Ibid., p. 28
[235] Ibid., p. 28
[236] Jackson (2011), pp. 36-37
[237] Ibid., p. 37
[238] Wendt (1999), pp. 79-81
[239] Ibid., p. 80

the way they "regulate behavior."[240] Wendt also differentiates causation from constitutive theorizing,[241] the latter failing to meet both the independence and sequencing criteria. In other words, social kinds (in particular) derive from external conditions.[242] More effectively conveyed: "The causal powers of the master do not exist apart from his relation to the slave."[243] Causal and constitutive theorizing for critical realists, then, does not abstract from reality; reality is reality, even if socially constructed and unobservable. Theories aim to unveil the way in which unobservables form part of reality and produce the effects that can be evaluated, or inferred.

Nowhere is this stance more clearly articulated than when Wendt describes the "success of science" as one that brings "… our theoretical understanding into conformity with the deep structure of the world out there."[244] As he points out, we can fly, the Romans could not. Do we understand our social world better today than the Romans? Wendt suggests that theories about rational choice, the democratic peace and balance of power, are, in some measure, a response to skeptics and a measure of "success" in the social sciences – in terms of theoretical understandings corresponding to a *real world* of laws and patterns.[245] This is perhaps interesting insofar as we adhere to the principle that every theory is waiting to be replaced by a new theory. It bears remembering that atoms were once believed to be the smallest particles in our material world (granted, a tired reminder, but useful as a check on the claims made). How can we be sure that the theory correctly represents reality? It is more interesting to note that the democratic peace theory is more of a correlative proposition, than theory per se. The observation is not backed by a strong consensus on theory. Waltz, for one, refuses to recognize the correlation as a theory and calls it a thesis, instead, proposing explanations for why the correlation only seemingly obtains.[246]

Jackson's interpretation of Waltz as an analyticist, as distinct from critical realists, offers important insights into how causation might be otherwise treated. Waltz' claim that theory produces "*a"* reality – a monist

[240] Ibid., p. 82
[241] Jackson takes issue with the distinction, arguing that constitutive reasoning is simply causal. Jackson (2011), p. 105
[242] Ibid., pp. 83-84
[243] Ibid., p. 88
[244] Ibid., p. 65
[245] Ibid., pp. 67-68
[246] Kenneth N. Waltz (summer 2000), "Structural realism after the Cold War," *International Security,* 25:1, pp. 6-13

claim that Jackson pairs with how an analyticist would view theories, more generally, as being, "… in some sense more continuous with the world that they are investigating,"[247] or simply non-representative of an empirical world, as viewed by dualists. Jackson differentiates analyticists from critical realists by suggesting the former attempts merely to "pragmatically" order a complex reality through the use of over-simplifications; critical realists reference an external world, by contrast, composed of "real-but-unobservable components."[248] For analyticists, then, causation need not be systematic, but may refer to specific historic outcomes as brought about by any configuration of these idealized factors serving to order experience. Last, because analyticists do not adhere to generalizations about the world but to produce narratives that "… order facts of the world," causation rests with the use of counterfactuals.[249]

Waltz has postulated, "Even if we have satisfied ourselves in various ways that a correlation points to a connection that reliably holds, we still have not accounted for that connection in the sense of having explained it."[250] And statistics are mere descriptors; more data observations do not alter this fact, according to Waltz. If, as Waltz suggests, that "Theories show why … associations obtain,"[251] then the question is: how do we go about, pragmatically, devising theories? Waltz suggests that, "To isolate a realm is a precondition to developing a theory that will explain what goes on within it."[252] This claim is critical because it concisely demonstrates Jackson's claim that Waltz views the challenge pragmatically; the world is complex, and one realm is connected with another. To better understand and explain why certain laws appear to obtain, the only hope, really, is to "usefully" bracket all interplaying domains and focus on the one factor that scholars believe will elucidate a theory for *why* we are observing *what* and describing it.

As such, Waltz seems little concerned with "reality," per se; experience deceives. Like Weber, Waltz turns to theory, as a way to order the world. Jackson, in his book section on analyticism, does speak about Weberian ideal types: the "theorist *par excellence*" according to Jackson, of "… analytical monists [who]

[247] Jackson (2011)., pp. 113-114
[248] Ibid., pp. 113-114
[249] Ibid., p. 115
[250] Waltz (1979), p. 3
[251] Ibid., p. 5
[252] Ibid., p. 8

offer the notion of a disciplined ordering of the facts of experience."[253] Weber, as explained by Jackson, is a monist, who accepts the influence of cultural values on the way in which researchers view the world, rendering a falsifiable hypothesis about the world impossible. As argued for Waltz, Jackson suggests that Weber develops ideal types that are both simplified and are, thus, misrepresentations but that such concepts are, again, *useful,* or must be proven useful to be maintained.[254] *Useful* idealizations, then, are whatever can bring clarity to particular events or processes.[255]

Economic organization: causal theorizing. What does it mean to observe that conceptual meanings of productivity shift over time? To answer this question, we need to explore different theoretical foundations that attempt to explain economic organization. Weber is a good starting point. More specifically, the way in which ideal types may help discern processes – or raw forces – of economic organization is most pointedly explored in Weber's work, *The Protestant Ethic and the "Spirit" of Capitalism.*[256] For example, Weber confronts the conundrum of explaining the foundational support of religion for the rise of capitalism: "We can … only proceed by presenting these religious ideas in the artificial simplicity of ideal types, as they could at best but seldom be found in history."[257] He later defines the ideal type of capitalist entrepreneur as one, who, "… avoids ostentation and unnecessary expenditure, as well as conscious enjoyment of his power, and is embarrassed by the outward signs of the social recognition that he receives."[258] From this ideal type, in order to bring understanding about the essential workings of capitalist society, Weber traces the way in which entrepreneurial asceticism differs from previous ideal types, such as the traditionalist individual, for whom the *idea of exerting for more* than what is customarily at hand speaks little: "Whenever modern capitalism has begun its work of increasing the productivity of human labour by increasing its intensity, it has encountered the immensely stubborn resistance of this leading trait of pre-capitalistic labour."[259] In this passage, we understand that Weber cannot ascribe a systematic rule of causation: the break with traditionalism and the subsequent development of a *productive* capitalist society,

[253] Jackson (2011), p. 114
[254] Ibid., p. 143
[255] Ibid., p. 144
[256] Max Weber (1992), *The Protestant Ethic and the Spirit of Capitalism,* New York: Routledge.
[257] Ibid., p. 56
[258] Ibid., p. 33
[259] Ibid., p. 24

in which individuals work harder, consume less and produce more still – not for greed, but as a calling; here, new cultural values, or more specifically, religious values, underlie the shift. As an abstraction, the aesthetic entrepreneur, as ideal type, is *useful* as a way to understand the shift. The ideal type does not implicate a rule-like causal mechanism – or supporting evidence for a hypothesis – but may point to what Jackson has termed, a singular causal analysis: "… the empirical application of the model is more about calibrating the model than about falsifying it; the appropriate response to a discrepancy between the model and the data is either to update the model … or to adduce situationally specific reasons why the observed outcome in that case was not what the model ideal-typically envisions."[260]

In terms of discerning the mechanics of economic organization, the ideal-type ascetic entrepreneur would lead us to think about shifts in the relationship between production and entrepreneurship were we to discern evolving social meanings being attached to an economic concept as central as productivity, for example. It might be *useful* to try and capture abstracted elements of these new meanings as a way to help us frame our research, bracketing chunks of empirical reality, in order to see if the abstraction helps us to discern connections and expose the causal mechanisms at work. If the abstraction is conducted at the same level over time, it becomes practically easier to discern shifts in meaning and then to assess whether these shifts relate in any way to any social context, contingent to one point in time. No systematic mechanism can be ascribed to ideal types, in this Weberian sense of the term; hypothesis testing is not in order.

Waltz, on the other hand, may have simplified the international system, as an ideal type, but he clearly singles out mechanisms that provide for *inevitable* outcomes.[261] Waltz, as noted elsewhere, draws liberally

[260] Jackson (2011), p. 147
[261] This observation about the work of Waltz challenges the way in which Patrick Jackson has categorized Waltz as a monist/analyticist. In an e-mail exchange (1/30/2012) asking about this categorization, Jackson responded, "There is a world of difference between the kind on simplification that neopositivists do (which is about having a manageable number of variables) and the kind of simplification that analyticists do (which is about isolating causal processes and mechanisms). And the neopositivist dream is to capture everything that matters about reality in an empirically adequate model, where the analyticist would say that the very notion of an "empirically adequate model" is a nonsensical category confusion. Solow is correct, in my view, and Waltz gets confused about the epistemic status of his own model sometimes because of the pervasive neopositivism of the field -- but when Waltz says that competition produces sameness he means that it does so *in the model*, not that it necessarily does so *in the world* so that's not a place where he gets confused. Economists who say that they "test" their models don't mean the same thing as a neopostivist

from the market metaphor as a way of teasing out mechanisms of state actions: "Competition produces a tendency towards the sameness of competitors."[262] Waltz does allow for "socialization," but it would appear to be a kind of socialization that responds to competition, not social mores, for example. Waltz uses the example of the early Soviet Union to demonstrate how states may attempt to conform to international practices, despite what may have been their preferences, had the state not existed in an international system.[263] Looking at the way France, post World War II, consolidated its steel industry, then and long having been composed of fragmented family-owned units, in order to compete with productivity levels associated with American and German steel industries may provide another example.[264] The mechanism is the same: "The close juxtaposition of states promotes their sameness through the disadvantages that arise from a failure to conform to successful practices."[265] States, then, may compete – balance – on the basis of their relative rankings in an international system of power. The next question becomes: do states organize their economies on the basis of indicators other than power as a way of not incurring "disadvantages"? The claim made here is that competition and emulation of "best practices" in promoting productivity growth counts as the same mechanism of action as what states perceive to be in their interest to follow.

How do we substantiate this claim? The relevance of hypothesis testing differs for the scholars here under discussion. For Wendt, whether or not state power depends on "discursive structures" relative to other states or whether causal powers of states exist independently of other sovereign states can be translated into testable (and, hence, falsifiable) hypotheses.[266] While Jackson would consider this stance defensible for a critical realist, he describes the inanity of attempting to falsify ideal types – as an oversimplification of reality, cannot be subjected to hypothesis testing, when the description of that being tested is assumed to be "deficient" in the first place.[267] Yet, Waltz, the analyticist, describes a process of hypothesis testing, whereby hypotheses are inferred from theories. The difficulty, for Waltz, is in proposing a theory that is

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does, since models aren't falsifiable (although claims derived from them might be, but this gets us into Lakatos-territory about hard core assumptions and protective belts of heuristics ...)

[262] Waltz (1999), p. 127

[263] Waltz (1999), p. 127

[264] See chapter 6 for a further discussion of this claim.

[265] Ibid., p. 128

[266] Wendt (1999), p. 87

[267] Jackson (2011), pp. 145-146

sufficiently clear and plausible to render testing meaningful. For Waltz, unlike for critical realists, hypothesis testing is experimental or experiential, based from observations. For theories that fail or are found to be deficient, explanatory claims are to be correspondingly narrowed, once further tests have been tried and proven unsuccessful.[268] In other words, for Waltz, deficiency is not necessarily an argument against hypothesis testing; it is a prompt for theory refinement. Whether states organize their economies in response to competing outcomes in productivity growth indicators would be, for Waltz, a testable hypothesis based from observation. For Wendt, the way in which productivity indicators are constructed and used to organize economies would amount to an unobservable causal mechanism that can be revealed and tested for its outcome in a "regulated reality." For Weber, the notion of productivity, in and of itself, would reflect cultural values that are not "natural" in any meaningful sense, but could be developed as a useful concept to study as a means of inferring the inner workings of economies that base performance criteria on these constructed measures. Does productivity, as evaluated in any one culture at any one point in time, relate to the ideal type of economic organization prevailing at that point in time and space? This proposition cannot be tested. But assessing cultural meanings at different points in time and over different spaces might be a *useful* way to gain understanding about why economies organize in the ways they do.

A third research paradigm is critical to consider for discussion – reflexivity – and compare its implications for evaluating truth claims with those of critical realism as proposed by Jackson:[269]

> For critical realists, the "critical" aspect of their knowledge involves the disclosing of as-yet-unrealized possibilities afforded by the real-but-undetectable causal powers of objects, including human beings and their social relations; in order for those possibilities to be scientifically valid ones, they have to be grounded in some trans-observational technique for isolating and investigating causal power, such as a laboratory or a set of transcendental arguments. For reflexivists, on the other hand, neither a laboratory nor a transcendental argument is required, but instead what is required is a detailed self-examination of the social and historical conditions under which knowledge is produced.

Jackson pairs reflexivists with monism and transfactualism, distinguishing it from the analyticist tradition by virtue of its relationship to knowledge production. Both, according to Jackson abstain from producing a real and complete representation of reality, but reflexivists draw upon knowledge claims to seek change, by

[268] Waltz (1979), pp. 13-14. The point about hypothesis testing being incorrectly attributed to the analyticist tradition is discussed in Jackson (2011), pp. 114-115.
[269] Ibid., p. 167

exposing aspects of knowledge that challenge present social practices.[270] It might be helpful simply to differentiate analyticism from reflexivity by virtue of the researcher's role. Researchers following the analyticist tradition are passive knowledge producers, while reflexivists engage actively in their research agendas.[271]

Earlier in this chapter it was argued that both Wendt and Waltz appeal to self-help principles to explain certain outcomes (and for Waltz this pertains both to the international system as well as the neo-classical model of market systems); yet both are consigned to different ontological groups. Is self-help a *real* structure, an unobservable causal mechanism, which guides action? Reflexivists obviate the whole question by simply answering how history, accidentally or contingently, explains the present, often assumed to reflect "common sense," inevitable, practices, as defined by Antonio Gramsci:[272]

> Common sense is not a single unique conception, identical in time and space. It is the "folklore" of philosophy, and, like folklore, it takes countless different forms. Its most fundamental characteristic is that it is a conception which, even in the brain of one individual, is fragmentary, incoherent and inconsequential, in conformity with the social and cultural position of those masses whose philosophy it is. At those times in history when a homogeneous social group is brought into being, there comes into being also, in opposition to common sense, a homogenous – in other words coherent and systematic – philosophy.

In this passage, not only does Gramsci challenge the "sense" of "common sense," but he implies an engaged historical role to by played by those, who expose the myths. Gramsci distinguishes between those, who accept social conceptions uncritically and those, who think critically through commonly accepted notions about society and the world and, "… take an active part in the creation of the history of the world … refusing to accept passively and supinely from outside the moulding of one's personality."[273] Such a characteristic fits squarely into Jackson's view of reflexivity. Central to this dialectic through which history then changes is the role played by intellectuals and not mere thinking individuals, but thinking individuals, who fulfill a social function by becoming a spokesperson, in Gramscian terms, for their social class, and, indeed, *organizers* for society as a whole.[274]

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[270] Ibid., pp. 159-160
[271] Making such a neat separation, however, obviates the question of whether all knowledge production is influential in some way and can be *acted upon.*
[272] Antonio Gramsci (1971), *Selections from the Prison Notebooks of Antonio Gramsci,* New York: International Publishers, p. 419
[273] Ibid., pp. 323-324
[274] Ibid., pp. 5-14

Of the three research paradigms explored, it would seem as though reflexivity, as here summarily parsed, could provide a useful frame through which to evaluate outcomes for the present research: abstracted shifts in the scientific discourse as linked to changes in the social context may fit within an analyticist frame, but the act of exposing non-essentialist properties of a scientific commonplace, such as productivity, could also be seen as *active* research, or research that works to propose alternative meanings to productivity. Were the scientific discourse reflected in the policy discourse, the way in which these meanings exert organizing effects would substantiate claims that the discourse is *productive* and that alternative meanings would, intuitively, result in different social and economic outcomes.[275]

This research explores the claim that ideas about productivity – and their statistical measurement – produce real, organizing (material) effects and that these ideas are not essentialist in any meaningful sense, but shift in line with (or reflect) changes in the social context. The question that is more troubling to answer is how ideas about productivity spread: contingently or through some structural, unobservable, self-help mechanism? According to Jackson, critical realism's base claim of a mind-independent world pose challenges for the study of social objects. He cautions: "If we can only be certain that knowledge claims refer to an external world when they are directed at physical objects, then in order to study social objects we have to root those social objects in some kind of physical, material based … otherwise we remain uncertain that our knowledge is actually referring to anything external."[276] On this cautionary note, the claim being made in this study is that productivity statistics, as well as the rhetoric deployed regarding their social meaning, have causal effects. These effects are assumed to present in tools of economic organization, such as policy and legislative initiatives. But this claim does not *assume* that the way in which productivity statistics and rhetoric affect their outcomes corresponds to an underlying causal mechanism.

[275] Whether alternative meanings of "productivity" would have generated a "better" outcome is not explored in this dissertation; such would amount to a normative assessment.
[276] Jackson acknowledges that critical realism does not necessarily posit a strict mind-independent view of the world such that only physical objects can be said to exist. Jackson (2011)., pp. 96-97

To take the discussion to a more concrete level: a number is not a tank, and a statistical topography of a nation is not material. The statistical topography, though, has a real material effect: borders are drawn and ownership is established. An attempt to appropriate anything from what is "properly" attributed to the interior might ignite conflict – a real outcome so to speak. And yet, numbers may also work to create national identity – these numbers belong to us, they *make* us – which is hardly a physical effect; yet, it, too, speaks to the "success" of an idea. If we were to take the argument to a slightly more abstract level and suggest, for example, that the statistical topography provided more than raw counts: in fact, it documented productivity – defined as output per input invested – then we might say that the *idea* of productivity resulted in a socially meaningful concept; we are successful when we produce more, with less. But "success" is attributed to a value – the value of more with less effort – and, as such, numbers at this level, too, do ideational work, or lead to an ideational outcome. Do states take this constructed definition and become socialized on the basis of "reinforcement,"[277] or do underlying structural constraints direct action in a particular way? Are there physical effects to valuing productivity, so defined? Surely there are – reorganization of production processes, for one. Are these effects and the way in which they were produced a function of structural laws of human action or contingent to history and accident?

Critical realists are differenced from neo-positivists in that the former describe possibilities – what *could* happen – rather than what will happen, according to Jackson.[278] This description helps clarify: that the concept of productivity *and its representation in numbers* may offer causal explanation for particular outcomes in different social contexts, for starters – it is possible to understand a causal mechanism at work,[279] with a particular outcome; it is impossible to extend this mechanism as a law for all history, across space and time. Productivity statistics, and the rhetoric that is formed in parallel, are presumed to influence action *through a mechanism*. I assume meanings attached to productivity to be contingent and make a

[277] See discussion on p. 70.
[278] Ibid., p. 111. This claim runs somewhat contrary to one made in an earlier work by Jackson, where he argues that "Critical realists are correct to emphasize that action is produced out a context of resources and possibilities, but they go too far in assuming that they can determine the extent of those possibilities in advance, instead of leaving them to the determination of the actors themselves." Patrick Jackson (2006), *Civilizing the Enemy: German Reconstruction and the Invention of the West,* Ann Arbor, MI: The University of Michigan Press, p. 40.
[279] Jackson references the work of Patomäki and Wight, who describe these mechanisms, not perceivable, as "structures, powers and tendencies." Heikki Patomäki and Colin Wight (2000), "After postpositivism? The promises of critical realism," *International Studies Quarterly,* 44:2, pp. 213-237.

tentative claim that new meanings reflect alterations in the social context. In order to describe or discern a possible mechanism of change, I abstract these meanings to represent a kind of ideal type – only in this way can an analytical narrative be formed and serve as a *useful* frame against which to argue for claims being made. In short, I am developing two arguments, each of which is based on different methodological assumptions: analyticism provides the basis for abstraction and reflexivity offers the possibility of using this knowledge for change by querying the basis for the meanings adopted. Holding out the possibility that the spread of ideas works through some sort of self-help principle, or a principle of competitive coercion – structurally grounded and undetectable per the assumptions of critical realism – cannot be proven in this dissertation, but it is included in the discussion as a way to keep a check on the analysis provided and ensure that the research dialogue remains open.

Research phases as clarified through theoretical and methodological frames. The research is inspired by a deceptively simple puzzle: Why does the concept of productivity have currency among economic and policy elites, as well as the general population as a whole? The question can be answered in a straightforward manner if certain assumptions obtain: (1) The concept of productivity is assumed to reflect a discernable material world, whereby components of productivity – output and inputs – are accurately represented in statistical series, comparable over time and across space; (2) the components of productivity growth are grounded in essentialist mechanisms that reflect law-like economic properties; and (3) the societal value of gaining more for less – with its attendant changes in production processes and economic organization – is a natural human inclination. If all three assumptions obtain, then the puzzle becomes a prosaic question, for which the answer is clear: productivity growth provides the key through which societies achieve higher standards of living and avert market failure. Productivity measures capture this causal mechanism and provide the statistical benchmarks through which success is gauged.

I query, or call into question, these assumptions and aim to explore further the claim that productivity measures provide an objective representation of economic performance and that societies naturally value the outcome of higher productivity growth – the production of more. Weber, as has been noted, challenges

the latter by suggesting resistance, or contestation, on the part of pre-capitalist labor when faced with more stringent, accelerated labor requirements to enhance "productivity."[280] Wendt, by contrast, does ascribe a certain essentiality to a "need" for individuals to "transcend." In his discussion on "rump materialism," Wendt posits five human material needs, starting (in importance) with *physical security* and ending with *transcendence,* which suggests that, " human beings need to grow, develop, and improve their life condition. This is a source of creativity, innovation, and of efforts to remake their material circumstances."[281]

Such, alas, parallels the rhetoric of productivity growth: we need to strive and better our standard of living. The question is: is it *real*? Wendt differentiates his position from classical realists, who ground their ontological position in the "structural materialism of power," not "human nature," per se. Wendt believes that needs define human nature; unmet needs generate anxiety and fear, but how those needs (interests) are defined are constructed.[282] Weber's argument is different: he is claiming contestation to a particular work form that may produce more (read: material wealth), but at a price that is not "natural" to pay. Indeed, Weber writes about human needs in his work, *The Protestant Ethic and the Spirit of Capitalism,* and speaks to a dearth that stems from "… current theories of productivity and low wages,"[283] and the dearth might be read to implicitly mean that "human needs" are not met in this new system "… now bound to the technical and economic conditions of machine production."[284] Weber concedes he is overstepping the more narrowly defined research mission to expose history – lamenting lost cultures and ideas, by contrast, is a *judgment*, but one that Weber so clearly values.[285] Weber's ontological narrative differs from that of Wendt, which in its efficient and succinct nominating of basic needs conveys a kind of *know-it-all* presumption that many scholars may have trouble digesting. Clearly, Wendt is not pitching productivity growth as the ultimate conduit to transcendence – but the idea that we can improve our material standing – the rhetoric of productivity growth – is a more constraining human-needs condition than what Weber is

[280] See p. 68 of this chapter.
[281] Wendt (1999), p. 132
[282] Ibid., p. 132
[283] Weber (1992), p. 120
[284] Ibid., p. 123
[285] Ibid., p. 124

describing, per se. For Weber, we would expect to see contestation to the "production of more" as evidence suggesting that transcendence is not necessarily grounded in material wellbeing. For Wendt we would accept the rhetoric of productivity as appealing to a *real* human need. How would we know it is *real*? We would have to "infer as best explanation" by discerning a continuous, uncontested rhetoric about material need – particularly over breaks or ruptures in systems that could, arguably, work to promote interest "reconstruction," or call into question those collective interests previously taken for granted as "common sense" values.[286]

But, does explicating the extent to which productivity and its promise of more is *real,* or constructed, sufficiently explain the puzzle of why the concept has for so long and successfully earned the currency of elites and the general population? Whether or not the concept is based in material reality in the sense of a basic human need or simply reflects a world of construed, contingent interests only answers the question that the concept is legitimizing: class-based interests, for example, are effectively neutralized because if more is available for less, no one group need sacrifice. But such would not explain how the concept persisted over time and across space during episodes of general economic malaise, labor unrest or market failure. If productivity *was* to provide hope and a better standard of living, why did it not protect the economy from negative outcomes and why, then, does the concept continue to be enlisted as a rallying cry for rescue? Is rhetoric so strong as to survive such challenges to its legitimacy?

Maybe, but such probably does not provide a complete explanation: the neutralizing rhetoric of productivity made it a forceful mover of policy, for sure, but words get *old* – they loose their potency. To better understand the resilience of the rhetoric of productivity and its staying power, the concept must be studied over time: did the way in which meaning was attached to productivity shift over time and at key break points in economic events in ways that reflected changes in the social context? If so, such would help explain the concept's staying power: the meanings we attach to productivity morph and adapt to new economic constraints and social values. The concept of productivity can alternatively be explained as

[286] The reference is to Antonio Gramsci and his definition of common sense values, as discussed in this chapter on p. 72.

devoid of any ambiguity; productivity endures as a concept, because it is a true reflection of economic laws and changes in the way we conceptualize productivity, as well as measure it. We progress, over time, linearly. Either way works. In the former case, the concept exerts the powers of plasticity and adaptation or transfiguration, in the latter, of scientific legitimacy.

If the research reveals the latter to be at work – that productivity measures reflect essentialist economic laws, devoid of ambiguity – then the books could be closed. Our preoccupation with productivity would not be puzzling at all, for productivity would be a grounding principle of economic growth and social wellbeing. If, on the contrary, breaks or shifts in the scientific discourse were discernable, and these breaks (a morphing discourse) corresponded not to shifts in scientific understanding, but changes in the social context, or new social meanings, reflecting a reflexivist view of the world, then the research would need to proceed. Through what mechanisms do concepts of productivity and its measurement seed, take root and begin to exert organizing powers in an economy? In other words, do ideas do the heavy lifting in terms of explaining this mechanism, or do power interests and institutions? How do statistics figure into this causal process? Do ideas simply float in thin air and resonate with elites or do the numbers do the heavy lifting in terms of explanatory value? If the latter, then through what mechanism is the outcome achieved?

In order to answer this last set of questions, the research requires perspective. If the same ideas have purchase in countries with different institutional configurations, for example, such could provide an additional check or source of supportive evidence for the force of ideas, as compared to institutional structures (as claimed by the Varieties of Capitalism literature, for one), as organizing principles. Comparing the public discourse regarding these ideas can provide additional clues as to the mechanism of spread. Do elites from different countries embrace the discourse on productivity because it will promote their economic and social wellbeing – as sound goals, in and of themselves? Or, do country elites respond to the productivity discourse in more relative terms, as though productivity growth were a zero-sum game?

In other words, does competitive pressure drive the implementation of new ideas?[287] Or, are elites across countries opportunists, understanding the potency of productivity rhetoric and appropriating it to further their own causes? This latter question cannot be answered in fact. How can we really know what motivates a lawmaker to vote for or against a particular initiative? What is more important to the analysis is to discern whether competition is real or constructed. To do this, contestation to the ideas presented must be analyzed. In brief, this dissertation aims to (1) assess the social meanings attached to productivity and (2) attempt to discern its mechanism of spread.

Method

Jackson is careful to distinguish between methodological frames, which incorporate a researcher's assumptions about the world and the production of knowledge, as opposed to methods, which describe a researcher's toolbox – how data will be collected and analyzed.[288] At a general level, and as discussed under the theory section, a first tentative wager is made that research outcomes can be explained within a reflexivist framework, which details historic and social forces shaping the meanings we attach to economic concepts and, ultimately, their organizing effects. At a more specific level, it is claimed that productivity works to create these outcomes through a process of legitimization – both through its neutralizing message that the production of more can be had for less and for all, as well as by virtue of the scientific authority conferred on productivity models developed over the course of the 20th century. Shifts in the scientific discourse are discerned by abstracting the lens through which productivity is framed in these models as they relate to changes in the social context at any particular point in time. This methodology can be approximately situated within the framework of Weberian ideal-types, or the analyticist tradition.[289]

[287] See discussion on p. 70 regarding the way in which Waltz links competitive pressure, even at the level of markets, to the outcome of "sameness" among countries.
[288] Jackson (2011), p. 25
[289] See discussion on pp. 67-68. According to Jackson, research may borrow tools from different paradigms, but what counts is the basis on which the evaluation of truth claims will be made: "It is certainly possible for each of these positions to use the tools of the other: an analyticist might articulate a value-commitment to beginning with everyday understandings and proceed to elaborate an ideal-typical model of everyday understanding, for example, but that would not make her work reflexivist because the warrant for her claims would not simply be the fact that they were connected to a social group's common-sense practices but would instead be the fact that they were connected to an ideal-typical model rooted in a particular value commitment." Ibid., p. 178

Together, these methodological statements frame the dissertation research.[290] An alternative (or competing) wager might suggest that meanings shift and spread through competitive or other "unobservable" structural pressures; this wager relies on a critical realist analytical framework. The methods adopted to evaluate which mechanisms may be at work rely principally on the tools of discourse analysis, as well as on the implicit adoption of counterfactual reasoning.

The varieties of discourse analysis. Discourse analysis lends itself to various interpretations and applications. The definition of discourse analysis I adopt for this study is that described by Jackson in his work, *Civilizing the Enemy*:[291]

> A discourse is a pattern of activity, and not a structural constraint; specific performances and particular arrangements of discursive resources cannot fail to be of great importance. A discourse shapes what can be meaningfully said within it not by imposing some kind of repressive code of silence but simply by containing only a finite number of resources and making possible a finite number of articulations; this is why mutations and recombinations are central to this kind of analysis, as they (often quite unintentionally) make available novel conceptual resources and hence novel articulations.

This definition, because there are many in the literature,[292] is a helpful guide. As a "pattern of activity," the researcher understands the need to discern the ways in which discourse spreads in socio-economic spheres; that discourse "shapes" intimates that it produces an outcome to be discerned; that discourse does not impose "repressive" measures but is resource-limited suggests that meanings are accepted as circumscribed; last, that discourse morphs and recombines suggests that shifts should be discernable and provide clues for why these shifts occur – fissures and breaks in a discourse, here described as "mutations and recombinations," help us understand the force(s) of change.

As with the definitions of discourse, scholars describe different types and functions of discourse analysis, depending on a scholar's ontological assumptions. Howarth, for example, discusses "positivist" discourse

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[290] Jackson speaks to "methodological diversity" as "… a question about a diversity of arguments, not a question about the diversity of research traditions or schools of thought." Jackson describes as "nonsensical" any attempt to compare one methodology to another, for works of scholarship may rest on different arguments, for which different methodologies are required. Ibid., pp. 208-209

[291] Jackson (2006), *Civilizing the Enemy* ... p. 76

[292] See, for example, Jennifer Milliken (1999), "The study of discourse in international relations: a critique of research and methods," *European Journal of International Relations,* 5:2, pp. 225-254. In this article, Milliken takes a quote from Jim George (1994), *Discourses of Global Politics: a critical (re) introduction to international relations,* Boulder, CO: Lynne Rienner. This source describes discourse as a way to "… illustrate how … textual and social processes are intrinsically connected and to describe, in specific contexts, the implications of this connection for the way we think and act in the contemporary world." Milliken (1999), p. 225.

as, "… primarily instrumental devices that can foster common perceptions and understandings for specific purposes, and the task of discourse analysis is to measure how effective they are in bringing about certain ends."[293] Realists, by contrast, define the social world as composed of "… independently existing set of objects with inherent properties and intrinsic causal powers," while critical realists privilege "… the centrality of human meaning and understanding in explaining the social world … placing greater emphasis on the actions and reflexivity of human agents in reproducing and changing social relationships."[294] In the latter, a power nexus between the "powerful" and the "oppressed" is posited to create the dynamic of locking meaning into place, while a post-structuralist approach to discourse analysis is predicated on the claim that all social meaning is contingent and ambiguous – social structures are defined by these inherently unstable systems of meaning.[295]

Milliken, who focuses her work on the *method* of discourse, appeals to the idea of what "cultural resources" are available from which to develop a discourse, as Jackson does – who likewise concentrates his analysis on cultural resources, or what he calls rhetorical commonplaces.[296] It is this "delineation"[297] of cultural resources that permits the analysis to be framed and become workable – much like specifying a model or equation, the marking out of cultural resources center and ground the research – they define the source of legitimization and, as such, isolate the key *causal*[298] mechanism through which outcomes are produced. How discourse implements practices – what Milliken calls the *play of practice* – is related to *who* has the authority to speak and legitimate practice, as well as to tracing how any one legitimating practice is

[293] David Howarth (2000), *Discourse,* Buckingham, UK: Open University Press, p. 3.
[294] Ibid., pp. 3-4
[295] Ibid., pp. 3-4
[296] Rhetorical commonplaces are described as "… those vague notions that command more or less general assent in the abstract but that stand in need of detailed specification before they can be determinately linked to specific courses of action and to justify one's own preferred option." See Patrick Jackson Thaddeus (2006), "Making Sense of Making Sense: configurational analysis and the double hermeneutic," in Dvora Yanow and Peregrine Schwartz-Shea, eds. *Interpretation and Method: empirical research methods and the interpretive turn.* Armonk, NY: M.E. Sharpe, p. 266. In a footnote, however, in an earlier work, Jackson cautions that "… rhetorical commonplaces are only weakly shared between individual actors; if they were strongly shared, no debate would be necessary." Jackson (2006), *Civilizing the Enemy* ... p. 50 (fn. 6). This distinction adds no explanatory value to the causal power of rhetoric, and is therefore abandoned for this dissertation.
[297] This is the term proposed by Jackson. Ibid., p. 272
[298] Ibid., p. 266

inherently unstable and subject to transformation and change; as such discourse is historically contingent.[299] In the *play of practice,* Milliken identifies four methods of discourse analysis, each of which attempts to explain contingency but through a different analytical lens: *deconstructive method,* which aims to elucidate that other forms of truth are possible, given the instabilities of the "truth" that is commonly accepted; *juxtapositional method,* one that exposes the incongruity between accepted truths and events or issues that such truths cannot answer for; *subjected knowledge,* a method that attempts to expose these contradictions in detail and demonstrate how they represent challenges to the dominating discourse; and finally, the *genealogical method* that exposes the breaks in any one discourse over time, with power relations explaining such discontinuous shifts in accepted meanings.[300]

Both Howarth and Milliken provide theoretical and practical frames within which to conduct discourse analysis – they are but two examples of scholars in a discipline that continues to evolve and define itself.[301] The genealogical approach, as described by Milliken, follows from a Foucouldian approach, which is grounded in notions of power and its effect on the transformations of any dominating discourse. However, for this dissertation I make no such starting assumptions and proceed more neutrally – or naively – in that I attempt to trace shifts in the meanings attached to productivity, particularly as discerned in its scientific discourse, adapting a form of the "archaeological" method as articulated by Foucault:[302]

> In short, I tried to explore scientific discourse not from the point of view of the individuals who are speaking, nor from the point of view of the formal structures of what they are saying, but from the point of view of the rules that come into play in the very existence of such discourse: what conditions did Linnaeus (or Perry, or Arnauld) have to fulfill, not to make his discourse coherent and true in general, but to give it, at the time when it was written and accepted, value and accepted application as scientific discourse – or, more exactly, as naturalist, economic, or grammatical discourse?

In other words, the method remains more open-ended than a genealogical approach,[303] strictly defined. In the same way, the theoretical frame does not nominate *the powerful* and *the oppressed*, as characters typecast in a play, as what Howarth attributes to a critical realist discourse analysis. These assumptions are

[299] Milliken (1999), p. 230 and p. 242.
[300] Ibid., pp. 242-243
[301] Ibid., pp. 227-278
[302] Michel Foucault (1973), *The Order of Things: an archaeology of the human sciences,* New York: Vintage Books, p. xiv.
[303] Foucault adopts a genealogical approach in his later work, inspired by Friedrich Nietzsche, who argues that history does not develop progressively, but accidentally and contingently. Friedrich Nietzsche (1956) *The Birth of Tragedy and the Genealogy of Morals,* New York: Doubleday.

pre-disclosing and stunting, requiring ontological commitments and research directions that constrain the probe and analysis. Jackson's definition of discourse, by contrast, provides a way to maintain an ongoing, open-ended process of discerning discourse – what discourse circumscribes as meaningful and how those limits may morph over time.

Assessing the "work" of discourse: legitimization. In this dissertation I claim that, during the last century, the rhetoric of productivity served as legitimizing tool through which elements of economies were organized – typically in response to portents of decline. The essential "causal" element of the productivity rhetoric – that more could be produced with less, with benefits to be distributed to the collective whole – served to neutralize divisive interests, an effect made all the stronger and by its association with the science of productivity and the statistical measures that provided the gauges of action. I additionally claim that the staying power of productivity as an organizing principle in economies reflects its ability to adapt to changing, contingent social contexts, not because of any essentialist (rationalist) properties, per se.

In his work, *Civilizing the Enemy,* Jackson makes a point of linking causation to legitimation, but not in the sense of changing norms (for one) and attendant new decision-making algorithms for states and individuals. Jackson questions the sense of exposing motivation as evidence for the causal impact of legitimation, arguing that we cannot really *know* what someone believes. Rather, Jackson supports a Weberian interpretation of how legitimation may be causal:[304]

> Weber neatly sidesteps these thorny evidentiary issues by focusing on patterns of claims made in public; there is no implication in his work that *anyone* necessarily "believes" the kind of legitimating rhetoric that they are deploying as a way of justifying a course of action. His sociological focus is on patterns of claims, not the selection of claims by particular individual officials and speakers…their causal efficacy is also transpersonal and intersubjective.

Patterns of claims, in some sense, bracket *who* is doing the speaking. The research must, instead document *what* is being said and in which contexts: "…Weber is trying to direct our analytical attention to the social context out of which policy outcomes arise..."[305] By discerning these patterns, the researcher can begin to

[304] Jackson (2006), *Civilizing* ... p. 23
[305] Ibid., p. 21

understand how this discourse exerts organizing force. In fact, in another work, Jackson provides a clear *modus operandi* in order to analyze the "legitimation struggle," by listing the following three steps:[306]

- Delineate the cultural resources (rhetorical commonplaces) available as sources of legitimation
- Detail the specific histories of these resources through a genealogical approach[307]
- Assess the deployment of these resources by actors to achieve a specified outcome

Legitimation struggles implicitly suggest that contestation is present. Given the claim that productivity, as a concept, is neutralizing, we might expect little contestation. In fact, this claim about productivity – its neutralizing and scientific appeal – makes it a "least likely case."[308] If we do find contestation to a principle as successfully touted to be devoid of ambiguity as productivity, then we might lend more credence to the theory that the contingency, accident and the ambiguity of ideas provide explanatory value in terms of evaluating change.

Jackson assumes, "When it comes to meaningful social action, agency is creativity and contingency: the creativity of actors in assembling particular cultural resources in a specific way, and the contingency of the patterns that are thus produced."[309] Such falls in line with the reflexivist research tradition. More specifically as related to the present dissertation, I argue that the legitimizing appeal of productivity rhetoric and numbers work to pass policy, because these discursive elements are neutralizing, not only through their message as purveyors of progress, or the achievement of more with less, but also because they are framed within the authority of a scientific discourse and statistical indicators that serve as benchmarks for action. I also assess the productivity models and concepts detailed by economists and attempt to tease out shifts in economic ideas about productivity. For this claim, I adopt a Weberian-oriented analysis using ideal types[310] based from authoritative sources – in this case, key scientific papers on productivity and

[306] Jackson (2006), "Making Sense …," p. 272. Italicized words are terms used by Jackson and emphasized in the text.
[307] "Unlike approaches to the history of thought that seek to read the historically developed categories of mature modes of analysis backward into history and tell a tale about their emergence as a more or less rational process, a genealogical approach remains sensitive to the completely unintended nature of many important discursive shifts." Ibid., p. 274
[308] See discussion in Alexander L. George and Andrew Bennett (2005), *Case Studies and Theory Development in the Social Sciences,* Cambridge, MA: MIT Press, pp. 120-121.
[309] Jackson (2006), "Making sense …" p. 267
[310] See more detailed discussion of how "ideal types" relate to the present work on pp. 74-75.

math/statistical models published during the last century. The abstractions are simplifications of "reality," and discerned by analyzing patterns of presentation, the analytical and conceptual focus of the papers under consideration, the particular statistics used and the implications of those issues found to "confound" results, as well as the gauges by which success (productivity growth) is to be achieved. Jackson sufficiently clarifies the goal of abstracting: "… scholars should focus on what their particular theoretical specifications actually do in practice and what kind of world they help produce."[311] For the current study, shifts in the *conceptual lens of productivity* are identified with the aim of understanding how transformations in meaning may influence, for example, legislative goals.

Counterfactuals. The use of ideal types or analytical narratives as a way to order empirical facts in a manner that elucidates why, for example, a particular outcome obtains requires the "disciplined use" of counterfactuals, according to Jackson.[312] This claim counters, though, a generally accepted notion that causation, in *any* sense, implicitly suggests the deployment of a counterfactual: a claim that *x* causes *y* implies that *x* could not have occurred without *y.* Although he suggests that adopting the methodology of critical realism releases the researcher from this obligation,[313] it is difficult to understand how causal claims of any order could be made without them, though not in the sense of creating a fictitious "controlled comparison," as explained by George and Bennett.[314] If the goal of research is to understand the real effects of a mechanism such as the discourse on productivity, then counterfactual analysis, to some extent, becomes an implicit method in coming to this conclusion. Milliken describes the use of counterfactuals in discourse analysis, suggesting counterfactuals to be a main reasoning tool.[315] For the discourse on productivity, the counterfactuals to be posed are: (1) Without the particular social meanings attached to productivity at different points in time during the 20th century, would legislation have been focused differently, that is, could legislation relating to economic policy *not* have reflected these meanings? (2)

[311] Ibid., p. 268
[312] Jackson (2011), p. 115.
[313] "The imaginative elaboration of plausible counterfactuals is critical to analyticist scholarship; critical realist and reflexive arguments do not require this kind of imaginative elaboration, and neopositivist arguments regard counterfactuals to be logically equivalent to comparative cases." Ibid., p. 208
[314] George and Bennett (2005), pp. 167-168
[315] Milliken (1999), p. 237

Once legislation came to be debated, would it have passed without the neutralizing and legitimizing power of productivity rhetoric and statistical measures?

Discourse as a "pattern of activity": where to locate it. I attempt to identify mechanisms at work by explaining how discourse seeds, embeds and spreads. As a pattern of activity, the sources of discourse are, arguably, limitless: decisions must be made in order to frame the research within reasonable bounds. I have designed the research to cover three "locations" of discursive elements: the *scientific literature*, *legislative initiatives*, and the *popular discourse*. Productivity models and measures are primarily the province of economists and statisticians; as such, the published scientific (economics) literature, intuitively, reflects those concepts and statistical models accepted as authoritative and legitimate. If the scientific discourse is to spread and exert organizing effects in economies, we would expect one conduit to be legislative initiatives pertaining to economic policy – economic papers, or economists themselves would represent the concepts and statistical measures used to guide policy action and would likely be to participate public debates as sources of authority, critically shaping debates and, ultimately, providing the *causal rhetoric* leading to specific legislative outcomes. Finally, a scientific discourse that has been successfully absorbed by the more general population, or those who could be most directly affected by economic legislation – business elites and practitioners – for one, should, in turn, be reflected in the popular discourse. These three sites of discursive elements together provide a plausible model to help reveal the workings of discourse and its spread.

Country selection. I do not attempt to compare country case studies as a "controlled comparison," or an adaptation of the experimental method for social science concepts.[316] These methods are abstracted strategies for isolating causal relationships between independent and dependent variables; as such, they can be drawn upon as a "first-cut" research program, helping to identify key "variables" to come under study.

[316] George and Bennett (2005), p. 154. See pp. 153-160 for a more detailed discussion of problems associated with this method (such as the difficulty of taking social complexity into account).

For this dissertation, these strategies, such as a Mill's method of agreement[317] case study approach, are referenced only as a way to help eliminate specific causal claims in the literature, such as the organizing force of institutions compared with ideas – for one. As abstractions that are predicated on an assumption of regularity and steadiness of social processes, these methods are challenged by a reality more complex than what single variables can capture. Such does not dismiss the worth of such, methods, but adds a cautionary note and urges the research to complement the bare-bones model with supplementary evidence, such as what a process-tracing technique[318] may provide.

How was the decision made to focus on the United States? Sociologist Marion Fourcade argues that the discipline of economics became globalized not only because of a "… broadly universalistic rhetoric within economic science," abstracted from local cultural or historical conditions, but also because of transnational linkages, largely dominated by the United States."[319] The United States serves as the reference study country, as economists from the US are inferred to have dominated the science discourse in general, and the productivity discourse, in particular, during the 20th century: in the economics literature, few references, if any, are made to economists from other countries.[320]

If this dissertation proposes to discern the mechanism of idea transfer – whether due to essentialist properties of the ideas and goals conveyed, or to historically and socially contingent meanings that become legitimized through other mechanisms – then including a second country in the analysis is critical for perspective, or as a "control," loosely speaking. Ideas may transfer because they are universally valid. Or,

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[317] This method is widely covered in the methods literature: "A research design that compares cases which *differ* on one of the main variables of concern (either an independent or dependent variable), but that are *similar* on other variables understood to be potential causes or effects of that variable. However, in current usage, this label is generally employed more specifically for designs in which cases differ on the dependent variable and are matched (i.e., in agreement) on many explanatory variables. This method was proposed by J.S. Mills." Henry E. Brady and David Collier (2004), *Rethinking Social Inquiry: Diverse Tools, Shared Standards,* Lanham, MD: Rowman and Littlefield, p. 295. Emphasis in text.

[318] "Analysis of processes of change that seeks to uncover causal mechanisms and causal sequences." Ibid., p. 300. See, also, George and Bennett (2005), p. 82

[319] Marion Fourcade (July 2006), "The construction of a global profession: the transnationalization of economics," *American Journal of Sociology,* 112:1, pp. 156-157.

[320] Such does not suggest that economists from other countries were not contributing to economic theory. In France, for example, François Divisia developed a new index, "Divisia index," that measures changes in economic indicators on a continuum, rather than discretely, and this technique has been widely deployed in productivity measures during the last century. But making such contributions and, in fact, dominating the economics discourse, are scales apart. See page 135 in chapter4 for a further discussion of Divisia Indices.

ideas can transfer across countries because the arguments that compel one nation are simply accepted by another as legitimate, through an "unobservable causal mechanism" or through the causal force of rhetoric. One way to help tease out the evidence would be to compare the United States with another country, which organizes its economy through processes different from the US. France comes to mind as a country to which we attribute "statist"[321] features, as opposed to the "liberal" characterization credited to the United States. The argument would be: if the French began importing American ideas about productivity, such would at least to attest the ability of ideas to trump institutions, so described in the literature – a conclusion that is suggestive of agency, and is an important claim I make in this dissertation. The analysis can be taken further, however. If we were to see French elites importing ideas about productivity from the US, would it be possible to understand *why*? If the research aims to isolate motivation for decisions made, then the prospect is dubious. There is, first of all the tautological argument of suggesting that preferences are revealed through action, or that public actors are honest about their motivation, or even themselves know why they are making the choices they do.[322] Thus, the way to approach the analysis at a deeper level is simply to ask whether the process of legitimation is the same or different in France, compared with the United States. Does the answer to this question provide any further clarity regarding the force of rhetoric and statistical measures to produce specific outcomes? Do French elites appeal to immutable laws of economic science, or social meanings, or something else altogether, when attempting to pass policies to promote productivity? This dissertation will assess the rhetoric of competition and the way in which productivity statistics are deployed in public debates to effect action.

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[321] The pitfalls of assigning countries to "typologies" is discussed in chapter 2. Still, the scholarly literature makes use of rough categorizations: See Goesta Esping-Anderson (1990), *Three Worlds of Welfare Capitalism,* Princeton, NJ: Princeton University Press. In this work, France is considered to be an "ambiguous" case, which clusters with different groups of nations, depending on what is being measured, but typically places in the middle range of countries, which decommodify social services, for one. Ibid., pp. 50-52, 70-71, and 81. The role of the state in French corporate structures is discussed in Bob Hancké "Revisiting the French model: coordination and restructuring in French industry," in Peter A. Hall and David Soskice, eds., *Varieties of Capitalism: the institutional foundations of comparative advantage,* Oxford, UK: Oxford University Press. The origins of French statism, as distinct from the US version of capitalism is also discussed in Shonfield, Andrew (1965), *Modern Capitalism: the changing balance of public and private power,* London: Oxford University Press.

[322] Jackson (2006), *Civilizing the Enemy,* pp. 21-22. Another point to make: "… acting on one's interests unavoidably carries the baggage that one is acting on one's 'true' interests." Mark Blyth (2002), pp. 27-28

Switch points and historical junctures. As stated, this dissertation aims to discern shifts in meanings attached to productivity and its measurement during the last century. Shifts in the scientific discourse are not *a priori* assumed to follow historical shifts or any particular path. As such, the scientific discourse on productivity is broadly evaluated by discerning *who*[323] was key to the discourse, as evidenced by publications in major economic scholarly journals; major review articles on the topic provides another way to assess influential scholars in the field – patterns of publication and names mentioned within articles, or those with staying power in the literature also help reveal critical voices, or those with most legitimizing power. Productivity articles are then assessed in a near "textual ethnographic"[324] way. For example, papers were read to address the following questions in order to discern shifts:

- What statistical measures, mathematical models are used to represent productivity (key components)?
- What confounding factors to measurement practices are singled out? What reservations are expressed?
- What questions are being asked and what conclusions are being drawn?
- What variables are linked to productivity growth?
- What social objectives are linked to productivity growth?

By contrast, policy debates were selected around historical points, where changes in the social context could arguably affect the ways in which productivity was conceptualized. For this study, the two historical break points singled out are (1) post-World War II production and (2) the1980s -1990s information technologies (IT) revolution.[325] These junctures were chosen simply on the grounds that such events would rupture or alter the social context – or place new demands on the economy. The objective is to discern whether such historical breaks changed the way in which productivity concerns were addressed and

[323] The "who" in this case is a purely pragmatic consideration – it is a way to select those papers most legitimizing in terms of intellectual weight and recognition.
[324] Jackson (2006), "Making sense …", p. 273
[325] The scientific discourse provides an overview of the entire 20th century, as a way of gaining a broader, stronger perspective and to provide a way to gauge how the first switch point, the early postwar years, may have changed from the early 1900s. The policy chapters focus on the two switch points described, as the research aim for this chapter is limited to assessing (1) if the policy debates reflect the scientific discourse of that time (2) how these debates compare between France and the United States and (3) how policy initiatives may have contributed organizing effects in the two economies.

whether shifts in the scientific discourse were reflected in policy debates covering issues related to productivity and productivity growth. Policy documents and public debates provide the data sources from which to determine how policy initiatives were legitimized, as well as to discern the way in which contestation was framed. The popular discourse is studied at the same break points as those singled out for legislative initiatives and policy debates. The popular discourse is treated differently because editorial and advertising content can be roughly codified and quantified – in an indicative sense. This opportunity is leveraged to delineate the rhetorical sources of productivity in a separate manner, as a way of triangulating evidence: were the popular discourse, so presented, able to reflect shifts in the scientific and policy discourse, the confidence level for claims made would be stronger still.

Data sources – archival research. Journal articles in the scholarly press provide the data sources for the scientific discourse. For the US policy discourse, congressional debates constitute the major data source. For the post-war years, debates concerning the following legislative initiatives were selected for study:

- The Economic Cooperation Act, 1948 (authorizing the Marshall Plan)
- The Employment Act, 1946
- The Labor-Management Relations Act, 1947 (Taft-Hartley Labor Act)

These pieces of legislation were chosen for their impact and the likelihood that the ideas of productivity would be central to the public debates that preceded their being put to vote: as acts, each bill could be said to have passed; however, in the case of the *Employment Act of 1946,* the original bill had been heavily diluted; as such it counts as a quasi-negative case.[326] Debates surrounding The Stigler Commission (1961) were additionally analyzed, as price indices figure centrally in the construction of productivity indicators; as this commission was mandated to study the construction of price indicators and because it came at a time when the discourse is presumed to shift, these debates were analyzed as supplementary evidence (1) to better understand issues debated about price indices and (2) to help discern a shift in rhetoric from the early

[326] James Mahoney and Gary Goertz argue that negative cases should be selected only when "… outcome of interest is possible." See James Mahoney and Gary Goertz (November 2004), "The possibility principle: choosing negative cases in comparative research," *American Political Science Review,* 98:4, pp. 653. In this case, dilution of the act was not inevitable and, as such, and *loosely argued*, the inclusion of such a case can aid the analysis of why rhetoric in this case failed pass the bill in its original form.

postwar years. For the second break point to be studied, debates on the following legislative initiatives, thought likely to reflect new conceptualizations of productivity, were analyzed:

- Stevenson-Wydler Technology Innovation Act, 1980
- Bayh-Dole Patent Act (Patient and Trademark Law Amendment Act), 1980

In France, postwar modernization plans were not debated formally until the fourth plan. A question can be posed as to whether laws, such as the acts passed in the US, are comparable to plans that are *indicative,* and not binding in their effect. For a strict correlative analysis, the answer would be no. But for this dissertation, the choice of comparing French modernization plans with key pieces of US legislation is justified on the grounds that *rhetoric* is causal. In the US, rhetoric *and numbers* are analyzed for their effect on legislation passage. In France, plan rhetoric *and numbers* are analyzed to understand (1) whether ideas from the US are being imported by French elites and (2) whether these ideas have resonance in the wider sense of economic organization: were moves *made* to reflect ideas attributed to productivity growth? As the plans reflected the summary views of French elites on the economy the first two modernization plans presented during the early postwar years are analyzed. Because the fourth plan (1962-1964) was the first plan to become formally and extensively debated, these debates were covered as a way to discern how elites reacted to the results of the first plans, as well as the framing of the fourth – such was the most direct way to find public gauges of legitimation and contestation. For the time period covering the IT revolution, both the eighth and ninth plans are covered; only the ninth plan was debated in parliament, and these debates were analyzed, again, to trace sources of legitimation and contestation.

To answer the question whether US legislative acts and French modernization plans delivered real, organizing effects in the economy might simply be another way of asking whether having a government makes a difference in the way societies are organized – not an overly helpful proposition. My objective in taking the analysis further than the causal properties of rhetoric is simply to illustrate how discourse may be reproduced – by exerting changes in the economy that reinforce the discourse in place – or how it may become subject to change by exerting changes in the economy that alter the social context. The popular

discourse provides a measure for the extent to which the discourse on productivity, or its conceptualization, has spread. As a more "bounded site" of discursive activity, the popular press can provide yet another "check" on the claims being made, namely, that conceptualizations of productivity shift over time.

Inductive data analysis. Data analysis follows an inductive approach: "One does not formulate an ideal type out of thin air, it emerges only through an immersion in the empirical data and is principally to be evaluated in terms of its utility in making sense of the empirical situations from which it is abstracted and derived."[327] This approach is relevant, in particular, for discerning shifts in meanings attached to productivity, or the lens through which productivity growth is to be achieved. But, this approach is also an appropriate way to read through public debates, organize patterns of thought, discern where rhetoric is cross-cutting, and where it contests; such is the method of inductive data immersion.

While it would be perhaps of some value to generate frequency charts of the times "productivity" is mentioned in public debates and policy papers, such is impractical for sources that are not directly comparable (e.g., different pieces of US legislation and various French modernization plans); hence, a comparative analysis over time would be senseless. But, more importantly, because the way in which the discourse is framed over time is assumed to shift, comparisons become yet more meaningless. What is important is to determine the way in which the discourse rhetoric drives policy passage or blockage. As Jackson claims, "Only analyzing the discourse surrounding policy rather than merely the frequency of the words used can usefully illuminate social outcomes of some particular policy-making process."[328]

As an inductively led analysis, the research aim of this dissertation could be described as "heuristic," as that intended to expose new causal pathways, for one.[329]

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[327] Jackson (2006), "Making Sense …" p. 273
[328] Jackson (2006), *Civilizing the Enemy* ... p. 50
[329] "Heuristic case studies inductively identify new variables, hypotheses, causal mechanisms, and causal paths." George and Bennett (2005), p. 88

Double hermeneutic. In this dissertation, I interpret the way in which key productivity models at specific points during the 20th century can be abstracted as "ideal types," representing the lens through which productivity and productivity growth were to be achieved. These "ideal types" relate to commonplace and history-specific understandings about productivity, as seen in policy debates and the popular press. Because the researcher plays a key role in abstracting concepts from a complex reality – here, economic productivity models and the social context at the time they were published – the outcome cannot be considered invariant and "true," in any sense of the word. The researcher is providing one interpretation of the scientific models presented in the scholarly literature and, thus, should be open to criticism. Jackson writes about the double hermeneutic: "Both the social actors under investigation and the scholarly researcher conducting the investigation exercise agency to the extent that the social contexts in which they are situated are not conceptualized as being fully closed and determinate."[330]

As a way to provide a check on my interpretation of the scientific discourse, interviews were conducted with economists, whose works are covered in the dissertation to keep the dialogue open and to offer alternative interpretations of the scientific discourse as presented in this research. More importantly, responses from economists can help locate points, where interpretations fit together, and others, where understandings collide.

Evaluating truth claims: a rubric. In the reflexivist tradition, truth claims are evaluated to the extent that they illuminate the conditions under which beliefs, conceptions, and knowledge are produced.[331] Clearly, then, the "truth" of an outcome, or claim, such as "productivity was largely viewed through the lens of labor cost minimization, post-World War II,'' cannot be verified in any definitive sense. In his work, *Civilizing the Enemy,* Jackson declines to explain discursive shifts as a neo-positivist might do, accounting for variation in both the independent and dependent variables. Instead, Jackson clarifies, "… in my account part of the explanation of German reconstruction lies in the connection between discursive shifts and the

[330] Jackson (2006), "Making Sense …" p. 268
[331] Jackson (2011), p. 167

subsequent deployment of novel rhetorical commonplaces."[332] Using this reasoning as a way to elucidate the validity of truth claims suggests that shifts in meaning, as abstracted, must be followed by changes in the way policy debates are focused. In other words, "truth claims" become more analytically defensible, when the discursive shifts in the scientific discourse spread to other discursive locations, such as policy debates and the popular discourse. Finnemore lends currency to this idea by suggesting constructivists can help substantiate their claim by asking, for example, "… whether actors explain and justify actions in similar ways in different settings."[333]

To carry the analysis further and ask whether the deployment of productivity rhetoric was *causal* in terms of policy outcomes requires that causality conditions be delineated. Again, Jackson's work from *Civilizing the Enemy* provides helpful orientation:[334]

> I am not arguing that without 'the West' no one would have moved to defend Berlin from the Soviets, or signed a military alliance that included West Germany as an equal partner, or any of the other things that made up postwar German reconstruction. Instead, I am arguing that *the way in which* these things were done – *if* they were done at all – would be quite different: different reasons would be tendered for the policies, and the policies themselves would therefore be constituted quite differently.

Jackson contents himself with a Weberian notion of adequate causality, whereby outcomes are linked to a specific "configuration of factors," without which the outcome could not have obtained in any plausible sense.[335] Outcomes are not identified with particular causal factors in any sort of replicable way, but are specific to particular historical and social junctures.[336] This dissertation follows these guidelines in claiming that the deployment of productivity rhetoric in public policy debates produced outcomes that depended on the rhetoric for the content of policy passed, or not passed. Shifts in the way productivity was conceptualized at particular points during the 20th century is helpful to the process by providing the contrast needed to determine whether changes in the rhetorical conceptualizations of productivity are mirrored in policy debate outcomes.

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[332] Jackson (2006), *Civilizing* ... p. 77
[333] Martha Finnemore and Kathryn Sikkink (2001), "Taking Stock: the constructivist research program in international relations and comparative politics," *Annual Review of Political Science,* 4, p. 395.
[334] Jackson (2011), *Civilizing the* ... p. 42
[335] Ibid., p. 43
[336] The role played by a "concatenation of *casual mechanisms*" and their relationship to specific points in time is discussed in Jackson (2006), "Making Sense …" As Jackson states, "The basic analytical bet is that similar patterns of action in different contexts and in different sequences will generate different outcomes," p. 276.

In short, evidence that discourse is "working" would present as:

(1) The call for collective prosperity and rescue from decline, as well as the spread of discursive elements linked with the productivity discourse to different social "locations" at specified historical junctures. In this dissertation, as noted, the locations of primary interest are: the scientific literature, public policy documents and debates, and the popular press. The spread of discourse across countries would also lend support to the claim that discourse is active and organizing in its effects.

(2) Policy outcomes that appear compellingly tied to the rhetoric of productivity at the same points in time. One manner in which policy outcomes can be "adequately" connected to the deployment of rhetoric is to discern which issues are crosscutting in public debates and where political interests are otherwise divisive. By comparing two countries with different institutional figures – France and the United States – structural differences are "controlled for," at least partially. Were a discourse grounded in materialist, rather than ideational, foundations, we would not expect outcomes to be contested.

(3) Contested claims that betray instabilities of the discourse, its ability to morph and its ideational foundations. A discourse that reflected immutable laws of economic organization would not be sensitive to changes in the social context, nor would it demonstrate plasticity in the way it is applied and implemented. Discerning shifts in the discourse helps underscore the transformative character of discourse. Contestation exposes alternative interpretations of the dominating discourse at hand.

Chapter 4: The narrative of numbers and productivity models during the 20th century

The greatest material gain which those of the present generation have over the past generations has come from the fact that the average man in this generation, with a given expenditure of effort, is producing two times, three times, even four times as much of those things that are of use to man as it was possible for the average man in the past to produce … but from whatever cause this increase in productivity has come, it is to the greater productivity of each individual that the *whole country* owes its greater prosperity.[337]

Frederick Winslow Taylor, 1911

Taylorism and productivity measurement

These words, from a thin and influential edition, *The Principles of Scientific Management,* reveal what was to be the cornerstone of an emerging productivity discourse: from a set level of productive factors, more could be delivered, and more would be defined in terms of greater material wealth and prosperity. Importantly, this outcome would be achieved by the efforts of individuals for the collective whole. This one rallying cry – larger amounts from less and for everyone – would become a powerful message with staying power that exerted real material organizing effects in the French and American economies during the 20th century. Statistics provided the conduit needed to deliver the message. For Taylorism, like many production models, numbers delivered clarity and the basis of comparison through which to assess outcome.

Frederick W. Taylor summarized his four principles as (1) the development of a true science (2) the scientific selection of the workman (3) his scientific education and development and (4) intimate friendly cooperation between the management and the men.[338] Taylor's central claim – that workers would be willing to produce more, as opposed to "soldiering"[339] with co-workers – was premised on the notion that higher wages and work guarantees in return for greater output would bring employer and employee together in common interest. The prosperity needed to provide benefit to both parties could *only* come from

[337] Frederick Winslow Taylor (1998), *The Principles of Scientific Management,* New York: Dover Publications, p. 74
[338] Ibid., p. 68. Emphasis in the original text.
[339] "Soldiering" refers to the tendency Taylor notes among workers to hold effort back.

attaining *maximum productivity*, according to Taylor.[340] Increasing output, per man-hour invested, would cheapen product costs and then translate "almost immediately" into heightened product demand: more workers would be needed and, hence, jobs would be guaranteed.[341] But, if output was to be maximized, statistics needed to be collected and developed in order to track progress. It was numbers all the way down.

Number outcomes are everywhere cited in Taylor's work. For example, in an experiment to test the "law of heavy laboring," it is concluded that scientifically selected[342] workers can lift and push pig iron weighing 92 pounds 43 percent of the day. Using this benchmark, workers could together produce a maximum output level of 47.5 tons of pig iron per day, contrasting with an average of 12.5 tons at competing enterprises not adopting the scientific method. The numbers are footnoted: "…92 pounds per pig equals 1156 pigs per day; 42 percent of a day under load equals 600 minutes; multiplied by 0.42 equals 252 minutes under load; 252 minutes divided by 1156 pigs equals 0.22 minutes per pig under load."[343] Taylor notes that a pig-iron handler walks one foot in 0.006 minutes, with the distance from pig iron piles to car at 36 feet, on average; workers therefore needed to walk eight miles per day under load and eight miles free of load.[344] Taylor asks at another point what shovel load will lead a "first-class" man to maximize output – it might be 5, 10, 15, 20, 25, or 40 pounds.[345] For every task, there was a best method: design a test, take out a stopwatch and do the math. From the raw power of man, came product, which could be maximized by choosing the appropriate worker for the task at hand and tallying numbers relating work method, implement, motion, and load to output achieved. For each man, in any one situation, the statistics documented would indicate the most productive work method. For the "science" of cutting metals, formulas were developed following 26 years of research to replicate the process and maximize product:[346] $P = 45{,}000 D^{14/16} F^{3/4}$

[340] Ibid., p. 2
[341] Ibid., pp. 4-5
[342] In this example, a man's character would be taken into account when making the selection: "The man who is mentally alert and intelligent is … entirely unsuited to what would, for him, be the grinding monotony of work of this character. Therefore the workman who is best suited to handling pig iron is unable to understand the real science of doing this class of work. He is so stupid that the work "percentage" has no meaning to him…." Ibid., p. 28
[343] Ibid., pp. 27-29
[344] Ibid., p. 29
[345] Ibid., p. 31
[346] This formula, whose derivation is not explained, is one of three indicated in the text. "D" stands for the shape or contour of the cutting edge; "F" stands for the depth of the cut. Ibid., pp. 55-57

The scientific discourse and changing conceptions of productivity over time

In a remarkable way, Taylorism appeared set to confirm the reflections of 19th French savants,[347] who debated the extent to which statistical science implied a deterministic trap: probabilistic formulae would dictate social organization, given a distribution of human capabilities. But the narrative of the 20th century in terms of how productivity became conceptualized, and mirrored in its measurement, turned out very differently. A close examination of the scientific discourse shows that the concept of productivity – how it was measured and the meaning it conferred – shifted over time and in ways related to changes in the social context. The claim being made in this chapter is that the lens through which productivity was viewed and measured began with *man* during the early portion of the century when Taylorism was influential. Fordism took hold during the post-war years, and *process* then became the focal point. As growth progressed during the 1960s, productivity became more clearly linked to *material product*. By the 1980s and beyond, with the emergence of the IT revolution, ideas about productivity and its measurement became closely associated with *intellectual product*.[348]

1. Linking productivity to man

Taylorism was predicated on the law of averages: "There is no question that the tendency of the average man (in all walks of life) is toward working at a slow, easy gait … but there are, of course, men of unusual energy, vitality and ambition who naturally choose the fastest gait…."[349] The character of men could be graded in terms of their "personal coefficient."[350] It was about *men* and what amount of manpower could be mined from them. Productivity, in other words, was conceptualized through man.

Taylorism and early productivity measures: "man as machine." When Taylorism was influential, the quest to replicate ideal production conditions necessarily called attention to the impact of work conditions

[347] See chapter 2, pp. 59-60.
[348] Because this study makes the claim that ideas largely passed from the US to France during the last century, coverage of the scientific discourse on productivity mainly focuses on works by US economists. Works, particularly those affiliated with NBER, have been internationally influential. High-profile economists in the field, such as Zvi Griliches, whose works figure prominently in the pages to follow, have likewise established worldwide reputations.
[349] Ibid., p. 6
[350] Ibid., p. 45

on the worker. In a 1920 paper by P. Sargant Florence[351] from the American Bureau of Industrial Research,[352] the author asks, "… is it not precisely standardization of conditions that social statistics sighs for?"[353] Florence laments workers' "difficult predicament,"[354] that of a tedious, repetitive existence, but appears to welcome the hard fact as a way to advance the science of statistics. In a sense, though, the mere quest for statistical standards can also be argued to help legitimize and perpetuate this "difficult predicament." The question must be asked: to what extent are social statistics the reflection of work organization, and to what extent do statistics help *produce* (or, at least, help perpetuate) work organization? In this article, for example, productivity measures are gauged according to a "maximum" production value (a value that Florence admits to being an unstable reference); values for each activity are computed on an hourly basis.[355] The maximum output, recorded for production during a particular hour, is then considered to be the "standard" value of production (PP), against which "actual" productivity (AP) is gauged: PP-AP/PP.[356] Productivity measures are then calculated for different activities, based from averages of hourly output. Total plant productivity is calculated by weighting the different kinds of activities, per a "fatigue budget" -- with activities divided equally between four types of labor: "dexterous," "muscular" "lathe machine," and "miscellaneous machines"; each is accorded equal weight, because each activity accounts for a quarter of all plant activity. [357] In the statistics presented, diminishing returns for "muscular" labor during a 10-hour work day, compared with a 8-hour work day, have the effect of lowering average plant productivity for the former. The results may affect work organization, depending on the policy chosen. The question is: do the results aid in making a "rational" policy decision?

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[351] P. Sargant Florence was a prolific writer during the early 20th century on industrial organization. Works covered the general economics and sociology of industrial organization and specific topics such as "fatigue and industrial organization."
[352] The Bureau of Industrial Research was founded in 1904 by Richard T. Ely. See John Calvin Colson (May 1983), "Academic Ambitions and Library Development: the American Bureau of Industrial Research and the State Historical Society of Wisconsin, 1904-18," *University of Illinois Graduate School of Library and Information Science,* number 159.
[353] P. Sargant Florence (September 1920), "The measurement of labor productivity," *Quarterly Publications of the American Statistical Association,* 17:131, p. 304
[354] Ibid., p. 304
[355] Ibid., p. 296
[356] Ibid., pp. 294-295
[357] Ibid. p. 297-298

Attaching equal weights to the different activities renders the exercise dubious, at best: diminishing returns to labor exertion would most probably occur at different rates for each of the activities. In these calculations, "quality" is measured through the proxy variable "comparative accidents per given output per hour," a figure that is derived as a percentage of the plant's average hourly accident rate.[358] Again, equal weights are attached to accidents that occur, because "… the severity of the seriousness of an accident is not correlated definitely with the seriousness of the original error of the human being."[359] Here, quality of output is identified as "scrapped" production units – quality is thus directly related to quantity, with little to distinguish between the two. Moreover, no attempt is made to determine which kind of accidents produce the most deleterious results, in terms of quantity of spoiled output. Last, there is no discrimination among the errors of workers, who, it would seem, cause a unified level of damage – it is the law of averages. Together, this formulation of negative influences on productivity indicates a monochromatic world of identical products and near-interchangeable workers – all suitable to a Taylorist philosophy of production.

Yet, a distinction is made, later in the text, regarding output capacity of different ranks of workers. As Florence further attempts to formalize "comparative man-productivities," it is assumed that working capacities are distributed normally – the mean equal to the median and mode – with the curve becoming skewed by the presence of sub-optimally producing workers such as the chronically fatigued, or "neurasthenics" and other "non-normal" worker presentations. Curiously, although an attempt is made to accommodate a skewed curve, the ultimate measure of reference becomes the median,[360] not the average – a concept around which Taylor's principles are based. The author sidesteps this issue by claiming what is important is the *relative* productivity of workers, whatever the reference, as a way of establishing benchmarks for wage negotiations.[361]

The exercise intended to document comparative worker productivity is complicated, and although it is couched in terms of objective statistical reasoning, it is difficult to follow the logic: average productivity is

[358] Ibid. p. 298
[359] Ibid. pp. 298-299
[360] With the curve skewed, the median is no longer equal to the average.
[361] Ibid., p. 300.

said not to follow the normal distribution curve, because some workers will produce "restricted" output, something that is natural to human error,[362] but in this case, accounted for only within the "upper quartiles" of the workers, gauged according to productivity capacity. The gifted may slack, but not the dullards. The purpose of the exercise is to reduce the dispersion between the highest producing workers and those on the lowest level of the curve – another assault on the assumption of normal distribution. The author admits as much, claiming that the assumptions made allow for the most narrow of gaps between highest- and lowest-producing workers, hence allowing for error on the conservative side. And so: we are left with the lowest-producing "high-productivity" workers minus the highest-producing "low-productivity" workers. The differential is then used to calculate losses from what might have been produced, had there been no "restricted" output.[363]

But how is potential, "unrestricted" output, to be calculated? Florence, like Taylor, suggests that "restricted" output is voluntary and assumes that, "Physical restriction will produce exactly the same divergence from the normal expected distribution of man-productivity as would voluntary restriction."[364] It is further explained that physical restriction comes about when machines and tools interfere with labor operations, strictly speaking. In other words, labor productivity is not complemented by the use of machines, it simply detracts from what labor, by itself, can accomplish when free to exercise its task – this represents the pure form of labor productivity. The author assumes that the "natural" physical restriction is equivalent to "voluntary" restriction, or restriction due to accumulating fatigue and other "non-normal" afflictions. The next step in the math is to determine what the upper quartile man productivities can produce during operations that have no restrictions. The percentage difference between this quartile production and the lowest becomes the factor then applied to the operation where voluntary "restricted" output takes place. With a couple of additional math operations completed, the resulting statistic is to show

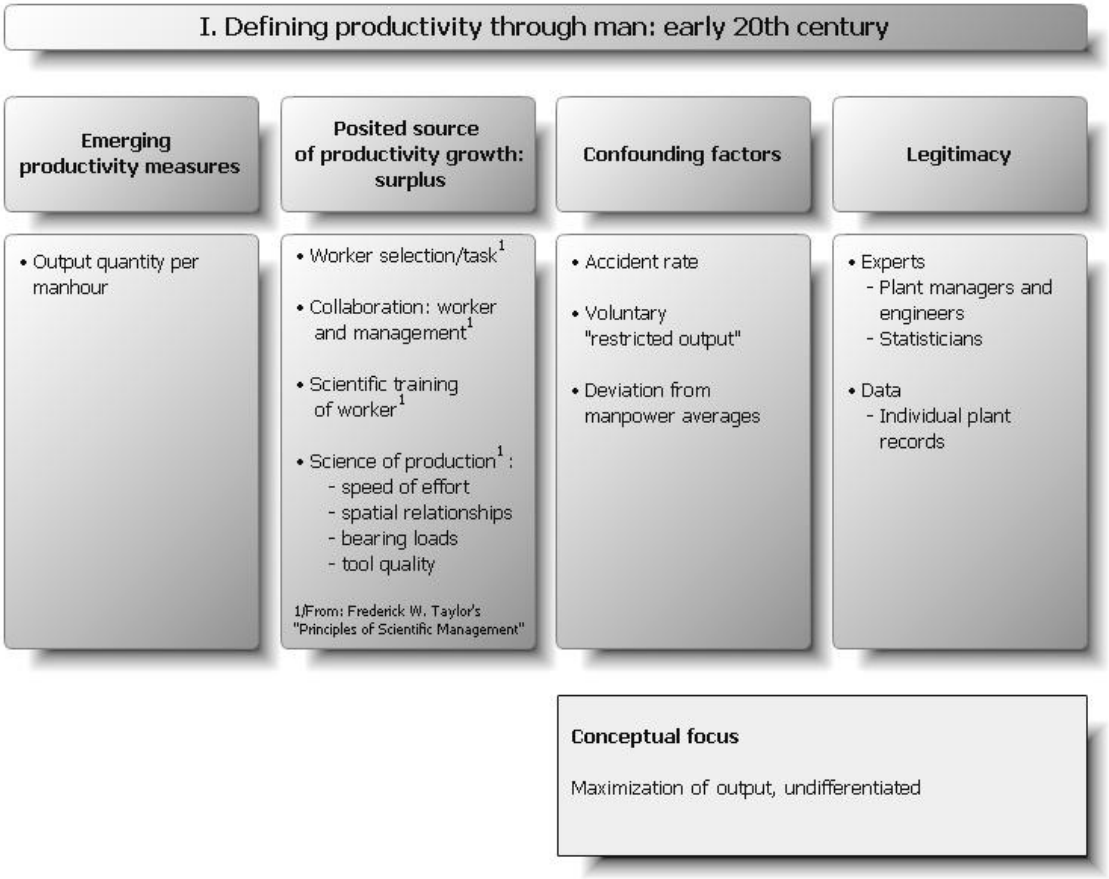
[362] Taylor also uses the term "restricted output," which he considers to be voluntary on the part of workers, prone to "soldiering" as described earlier in the text. See Taylor (1998), pp. 8-9, for example.
[363] Ibid., pp. 301-303
[364] Ibid., p. 301

a net average loss in productivity for the "whole squad."[365] The point of explicating the exercise is not necessarily to undermine its logical foundations but to discern the extent to which numbers are placed in the service of a production modality – Taylorism – where productivity is merely a relative term, defined primarily by speed of work and the lack of accidents (the aforementioned proxy for "quality"). Workers are admitted to present with different capacities, but these capacities are normally distributed, and when not normally distributed, the failings follow a pattern of remiss. Florence betrays the point of the exercise by suggesting relative productivity measures, however derived, provide the gauge needed for labor negotiations.

In this world, pricing does not come into play – it is output numbers, all the way down. The organizing factor in this scenario is time: short-term time, by the hour. And does hourly productivity really matter? In reality, the average man-productivity is shown to be higher for a plant operating an 8-hour shift compared with a plant operating a 10-hour shift. Is this how the standard 8-hour day came into play? What if the comparison had been between a 3-hour day and an 8-hour day, and the average turned out to be higher for the former? Would plant operators then be compelled to issue 3-hour workdays? What appears important is the relative man-productivities, here calculated on the basis of median quartile figures – benchmarks, only. Speed, uniformity and raw total output are the measures that organize the economy. What is relative and gauged according to a maximum value, attainable under ideal conditions, is, though, inherently unstable. Taylorism may have helped to inspire such measures, but establishing the measures has the effect of reproducing Taylorism; statistics lock the principles in place. How? Benchmarks provide a gauge, and the gauge triggers action. Action is geared to replicate the measure in order to "succeed." A summary chart (figure 4.1) of the discourse during this time is provided below.

[365] Ibid., p. 303. The author does not explain how we can be certain that the new activity, similar to the one under study, does not produce "restricted" output – the output is assumed to be achieved under conditions of full capacity, although the output total is not theoretical, but derived from plant records.

Figure 4.1



2. Linking productivity to process

Later productivity measures: Fordism. Following World War II, the quantitative discourse on productivity shifts markedly. Manufacturing processes become increasingly standardized, not labor, necessarily; it is Fordism in full swing, and the prestige of a victorious military power helps to propel US ideas about production into the spotlight. Productivity maintains its position, center stage, in discussions on economic organization, and issues associated with productivity measures continue to be debated in the scholarly literature. But the raw arithmetic – output per man-hour – used by Taylor is dismissed for its

simplicity: "Productivity of labor cannot be regarded as being other than a multivariate function."[366] For Sigmund Zobel, labor productivity derives from a series of variables (inputs), translatable to multiple linear regression,[367] with the "effort of labor" accounting for only one variable influencing labor productivity. Additional variables are divided among "objective factors," or the "physical conditions of work," including the state of the plant and equipment, prices of various factors, geographical location – to list a small selection. "Subjective factors" are those variables working at an "individual" policy level and include the management element, relationship of hours of work to optimal hours of work, level of wages, training and type of work, the phase of the business cycle – again, the list is not exhaustive.[368] Curiously, factor prices are considered to be objective, whereas wages are not; the notion of optimal work hours – an objective, measurable variable in earlier papers reflecting Taylorist assumptions, is here considered to be subjective. In fact, the sense of the division between what is objective and subjective is not easily discerned. What is interesting is that the perception of what is operating at a "standard" level and what is not has shifted. It is also the inclusion of ideational elements, such as managerial input and training, that marks a break with the previous discourse on productivity, where labor input was generally non-differentiated – apart from the *naturally* higher producing versus lower producing individuals. But now labor can be trained and management standards honed. Workers, in all their capacities, are no longer taken as given. They are constructed.

But if labor productivity is no longer adequately measured as output per man-hour, how are these additional elements to be taken into account? Zobel concedes that quantitative data are not available for the majority of the variables identified, rendering regression analysis a futile exercise.[369] Instead, he works through the ideas of two statisticians, who propose alternate measures of labor productivity. The first simplest measure calculates the reciprocal of labor costs, indexed to a base year wage rate per unit of product:

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[366] Sigmund P. Zobel (June 1950), "On the measurement of the productivity of labor," *Journal of the American Statistical Association,* 45:250, p. 218. Zobel was a statistician and professor at SUNY, Buffalo.
[367] Ibid., The relationship proposed is: $x_1 = \alpha + b_2x_2 + b_3x_3 + \ldots$, (b_1 is not indicated and the term "productivity" and "labor productivity" are used interchangeably in the text). See pp. 219-220.
[368] Ibid., p. 219
[369] The more dubious aspect of the postulated regression is the assumption of linearity, but this is not questioned.

$$I_{lci} = \frac{\sum_{m=1}^{k}\sum_{j=1}^{n} lc_{ijm}}{\sum_{m=1}^{k}\sum_{j=1}^{n} lc_{0jm}}$$

From this measure, the index of labor productivity, I_p, in period *i* is $1/I_{lci}$, where I_{lc} = index of labor cost at base wage rates per unit product; lc_{ji} = cost per unit of output of each type of labor in period *i;* lc_{jo}=cost per unit of each type of labor in base period *o*; n = number of different kinds of labor required; and k = number of products.[370] Two variations to the index here shown include one with weighted aggregate unit labor costs and a third one which takes the weighted arithmetic mean of labor costs into account.

Although the three indices are slightly different in levels of sophistication, each proposes that productivity be measured as the reciprocal of labor costs:[371] as labor productivity increases, labor cost per unit declines. At a superficial level, so much may be true in terms of the raw math (more output per worker could imply fewer workers needed to produce a unit; hence labor costs decline). But is this what the index captures? According to the author, it captures "more" regarding labor, including its composition and working hours. In truth, were hourly compensation to be considered, labor costs could reflect several conditions: (1) wages could rise with productivity, reflecting an adjustment to the value of labor; (2) lower wages could reflect either an increasing supply of or a diminishing demand for labor; or (3) wages could be related to a specific wage bargaining agreement (and may be related to the first and second points). If the argument, implicit in this article, is that lower labor costs allow for greater investment in machinery, thereby enhancing productivity, the logic is not watertight; lower labor costs could encourage labor to be substituted for machinery. The relationship between cost and productivity is not absolute. In a sense, using man-hours per unit would provide a more neutral measure of labor input. While using an index that takes different compositions of labor into account per product could be argued to capture a more accurate breakdown of

[370] Ibid., p. 221
[371] The discussion in the literature regarding the relationship between labor cost and productivity is sometimes confused, because it is not always clear how the cost figure is derived. A paper by Irving Siegel shows average hourly earnings to deviate from wages per unit of output due to productivity differentials. Siegel shows this by defining unit labor cost as average hourly earnings divided by productivity. The important point to note is the fact that productivity is now intrinsically linked to wage rates. See Irving H. Siegel (September 1940), "Hourly earnings and unit labor cost in manufacturing," *Journal of the American Statistical Association,* 35:211, pp. 455-460.

the units under study, linking labor cost to productivity,[372] without regard to what influences hourly compensation, hides more than it reveals. It must be borne in mind that what is being measured is not, in essence, "productivity," per se, but cost savings. This is a surrogate measure for productivity and one that statisticians have long used to represent productivity.

A second measure analyzed in this paper comes from a WPA statistician,[373] which essentially adopts a Fisher ideal index[374] to measure productivity. This measure calculates the summed product of the quantity of output manufactured and the output per man-hour in a particular time period.[375] The idea behind this index is to capture changes in labor requirements, with changes in the index reflecting the power of increasing or decreasing productivity, as measured by output per man-hour relative to total output.

Zobel makes a final attempt to capture productivity by adding the effect of machine power on labor productivity, claiming the relationship to be inverse: the greater the machine power (*E*) used, measured by the amount of energy consumed, the less output can be related to labor effort alone:[376]

$$\mathrm{I}_{\mathrm{pi}} = \frac{\sum_{m=1}^{k}\sum_{j=1}^{n} lc_{0jm} w_{jm}}{\sum_{m=1}^{k}\sum_{j=1}^{n} lc_{ijm} w_{jm}} \cdot \frac{1}{E_i}$$

This measure of labor productivity would suggest that capital cannot act as a complement to labor, but must be "controlled for," as in a regression analysis to isolate the effect of labor on its own (assuming a simple inverted value of machine power sufficiently captures the relationship). This formulation reflects a more "Taylorist" concept of labor, which is an entity, out of which a "machine" is made from its raw physical

[372] The theory and empirical evidence linking wages to productivity is complicated and is discussed in greater detail on pp. 115-118.
[373] Works Progress Administration, see Ibid., p. 222
[374] The Fisher ideal index, mainly used to calculate inflationary trends, is the geometric mean of the Laspeyres index multiplied by the Paasche index.
[375] This product is used for both indices, and each is weighted differently (base periods are used for the Laspeyres index and current period weights are used for the Paasche index).
[376] Ibid., pp. 223-224; Note that w_j = a standard ratio of time required per unit of output by labor type *j* to total time required per unit by all types of labor. Ibid., p. 221.

component – in fact, dividing by energy spent is nearly an early attempt at calculating total factor productivity, but the focus here is on labor productivity. Moreover, if ideational elements, such as management organization and labor "attitudes," can be taken into account for their influence on labor productivity, as they are in the introduction to this article, then machinery could just as well be considered an "aid" to labor, making it more productive (not detracting from its intrinsic force).[377] In the end, if fewer man-hours are now required to produce the same level of output, the separation between ideational and physical elements, is a construct. It is, then, a matter of definition, not essence. Still, its way of using labor cost as a means of getting at productivity shows an evolution in the construction of statistics. It is important, also, to note that the weighted measures represent an attempt to differentiate processes. And the acknowledgement that ideational elements play a role additionally has the effect of taking the exclusive focus off the raw power of man as the main productive factor.

Curiously, a statistician, Charles Young, from the Westinghouse Electric Corporation takes this issue up in an article written during the 1940s. In this article, Young asserts that, "It seems to me more reasonable to consider increased efficiency as a result than [sic] an inherent attribute of workers."[378] That is, labor cannot be viewed in isolation of the tools that make it productive and the social context that provides the very norms of work. During the years of Taylorism, raw brute force was measured by time and output in order to provide wage incentives for the most "productive" worker – labor was isolated. With the rise of Fordism, the meaning of productivity shifts to include processes and mechanization. Labor was not only part of a production process, but also a member of a broader social context.

As noted by Young, "A concerted drive is on to increase the purchasing power of organized labor, and the accent on *real* purchasing power, in terms of goods and services, is evident in the insistence that wage

[377] In fact, labor productivity measures today calculate total output per man-hour, which is not a measure of "labor productivity" per se, because output requires more inputs than only labor.
[378] Charles E. Young (December 1946), "Applications and problems of productivity data," *Journal of the American Statistical Association,* 41:236, p. 422. Young was one of the speakers, representing management, at the Conference on Productivity, which convened in Washington DC on October 28-29, 1946. See Thomas J. Mills (March 1947), "Notes on the Productivity Conference," *The American Economic Review,* 37:1, pp. 187-190

increases shall not be reflected in price advances."[379] And although Young lists numerous factors contributing to productivity, including mechanization, standardizations of products, job analysis, as well as improved health and working conditions of labor, he discards the effect of raw labor, "Out of this list it is immediately apparent that the skill and application to duty of individual workers must play a relatively small part in the total changes in manufacturing output per man-hour over an extended period."[380] Indeed, the role is assumed to play such a small portion of total productivity, that Young uses productivity data[381] by statistician Solomon Fabricant[382] to trace its convergence with data tracking "horsepower" per wage earner in the manufacturing industry. Even acknowledging that "installed horsepower" need not reflect "horsepower in use" – as indeed would be expected during extraordinary times, such as war, when work shifts were accelerated[383] – the author defends energy use as a proxy for output. The meaning of productivity in this context is clearly confined to production: whatever produces more. More energy can be expended and the result may be increased output of goods, but the link with efficiency is severed. Labor then becomes veiled behind a near-indiscriminate production process, and any gains are to be tied with wages and greater investment in machinery and plants to keep the cycle going. Addressing productivity in this way implicates the use of statistics as a legitimizing factor in the politics of "more."[384]

In fact, in an article from the 1940s that addresses the use of various labor productivity indices, W. Duane Evans and Irving H. Siegel from the US Bureau of Labor Statistics, admit this very point, arguing that labor productivity indices do not necessarily reflect "efficiency," but that they are often presumed to do so.[385] In short, the measurement can be calculated, and the biases can be taken into account, but the meaning of the numbers gets lost in translation.

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[379] Ibid., p. 428
[380] Ibid., p. 423
[381] Defined as output per man-hour in manufacturing.
[382] Dr. Solomon Fabricant (1906-1989), a prominent economics professor at New York University, led a long and distinguished career at NBER, starting in the 1930s. He received his PhD in economics from Columbia University in 1938.
[383] Ibid., p. 425
[384] As detailed in Robert M. Collins (2000), *More: the politics of economic growth in postwar America,* New York: Oxford University Press.
[385] W. Duane Evans and Irving H. Siegel (March 1942), "The meaning of productivity indexes," *Journal of the American Statistical Association,* 37:217, p. 110. Both Evans and Siegel authored NBER publications. Siegel (1914-1988) was an economic advisor with the Department of Commerce and joined NBER in 1939.

From this article, two categories of problems are clear: (1) the extent to which "proxy" indices reflect "true" labor productivity and (2) the way in which the indices are interpreted, thereby providing the grist for policy decisions. For the first problem, Evans and Siegel claim "true" indices are extant, but that data limitations force statisticians to use proxies, or approximations of the "true" index. They suggest the "proper" productivity index as given by:

$$I_{px} = \frac{1}{I_{rx}} = \frac{\sum^{n} q_x r_o}{\sum^{n} q_x r_i}.$$

What this index represents is the productivity index, I_{px}, which is equal to the reciprocal of the index unit of labor requirements (for product "x."). Labor requirements, in turn, are aggregated products of the quantity of product x (q_x) and the labor unit requirements for time *i* (r_i), referenced to the base period.[386] Evans and Siegel claim that the main difficulty in applying this index lies in determining the quantity of each good produced and the corresponding the labor requirements for separate products during the base period and all subsequent periods under consideration. Such detailed data are not available, and without an accurate documentation of the quantities of different products and their corresponding labor requirements, the index can produce wildly different values, depending on the "quantity complex" chosen (because of the weights attached to them). As a pragmatic solution, if total man-hours are available for each time period, this figure is used to calculate the denominator in this index. As such, the make-do measure fails to account for differences in labor requirements per product, with productivity levels able to shift for reasons beyond "efficiency." Levels would increase were labor-intensive products to be phased out, for example.

Alternate weighting factors include unit labor costs[387] (considered to vary in proportion to unit labor requirements) and value-added per unit of product manufactured. But these surrogate measures, even if available, come with their own biases and improbable assumptions (e.g., that hourly earnings average to the same value, across products, and that wages correspond to value-added in proportionate measure per good

[386] Ibid., pp. 104-106
[387] This issue of linking unit labor cost to productivity, discussed earlier in the text, will be analyzed in later measures, as well.

produced).[388] Still, even if these assumptions were to hold, the exercise linking cost and value-added to productivity is, conceptually, problematic. Taking value-added as a surrogate measure of productivity, for example, essentially attempts to capture the elusive process of creating "something" beyond that implied by the raw inputs. How does this relate to labor efficiency? Only obliquely: lower labor costs, again, can be a function of changes in wage agreements, or a declining amount of labor input needed; moreover, value-added also reflects pricing and markets, among other elements beyond input cost, and the link to efficiency is thereby inconclusive, at best.[389]

If, however, the *meaning* of productivity is taken to be whatever pushes us beyond the valuation of inputs, then value-added measures make sense; the measure does not, however, capture labor productivity, or efficiency, per se; it is a matter of interpretation. For example, value-added measures could be interpreted to mean, as they have come to be accepted, that the factors of production provide "services," thereby accounting for the value created beyond the summation of raw inputs.[390] Whether this new idea, as a surrogate measure of productivity, reflects a shift from Taylorism to Fordism can be debated. Certainly, however, the shift represents a move away from "man as machine," from the notion that more power can be squeezed from brute force, towards an idea that processes, ideas, managerial organization and other "ideational" elements transform the equation so that the sum now becomes greater than the parts. Fordism, with its focus on specialization and standardized production, *is* ideational in its roots; it is about organization and creating more from the given material resource; moreover, value-added measures have the effect of taking the focus off labor, as a single production input. But whatever conceptual frame is used to capture the notion of productivity, the raw *measures,* according to Evans and Siegel, and the chorus of others in the post-war statistical studies, often come up short in an imperfect material world of narrowly countable items and erratic time discontinuities; poor proxies, such as "shipments" and "sales," were sometimes the only data available[391] – this does not capture ideas, or even pure physical outcome, in any

[388] Ibid., pp. 107-108
[389] Value-added continues to be considered a valid measure of productivity. See OECD (2001), *Measuring Productivity, OECD Manual: measurement of aggregate and industry-level productivity growth,* Paris: OECD, pp. 23-38
[390] Value-added figures are assumed to converge with total output, when computed at a sector level. See Ibid., p. 23
[391] Ibid., p. 108

meaningful sense. Moreover, changes in productivity values, as derived from indices, are subject to interpretation, as well. Evans and Siegel point out that indices cannot capture provisional changes due to alterations in capacity utilization – as one example.[392] If it is assumed that "capacity utilization" has nothing to do with inherent productivity, then the erratic changes in productivity measures that have more to do with varying capacity use than the manufacturing process, per se, would be misleading. The proxy measures and assumptions analyzed in this article are summarized below:

Proxy measures for unit labor requirement •underlying assumptions

Unit labor cost • same average hourly earnings across products

Unit value-added • value-added same proportion of total across products

Unit value • constant ratio between value-added and value across products

Wholesale price • no influence of additional factor costs

Capital enters the equation. During the mid 1950s, the European Productivity Agency (EPA), through the Organization for European Economic Cooperation (OEEC), published an article exploring different concepts and measures of productivity.[393] In a review of the work by John W. Kendrick from the National Bureau of Economic Research (NBER),[394] the differing concepts of productivity are considered. Interestingly, what emerges from the review is the fact that statisticians on both sides of the Atlantic had at that time not yet come to terms with what inputs should be considered in productivity measures. Total factor productivity, a term common to the definition of productivity today, was only then beginning to be explored.

[392] Ibid., p. 110. It is important to note that indices, as empirical measures of what is presumed to approximate "productivity," are non-parametric statistics; the measures do not explain *how* productivity comes about; parametric measures, such as those derived from econometric equations do attempt to find correlations between independent variables and the dependent variable, "productivity." These measures are discussed later in the text.
[393] The European Productivity Agency, (1955), *Productivity measurement, Volume I, concepts,* Paris: OEEC.
[394] John W. Kendrick (September 1956), "Review: [untitled]," *Journal of the American Statistical Association,* 51:275, pp. 546-548. In a speech delivered by Princeton economist, Albert Rees, in 1962, Kendrick is credited with the development of alternative productivity concepts. Some of these concepts are discussed later in the chapter.

The idea that labor productivity had been the focus of statistical measures since the early years of the 20th century is plausibly, if not obviously, related to the fact that labor had, until widespread industrial mechanization, been the primary input in production processes – something not overlooked by Marx and reflected in his labor theory of value. In short, labor had long been central to discussions about production. Even by the 1950s, however, statisticians' attitudes towards capital were tentative at best, not only because capital inputs were considered difficult to measure, but also, because the world was still seen through "man," with labor productivity considered not only important as a way of measuring efficiency – whether true or not – but also because production was "for man."[395] In a sense, labor productivity became a surrogate measure for the standard of living.[396]

The French, co-inventors of statistical science and the original advocates of measuring social processes following purportedly predictable patterns, were not happy with this single-sided orientation. Indeed, Kendrick credits the French with coining the term, "total productivity," meaning that all inputs in a production process had to be related to outcome, if real productivity measures were to be developed.[397] But the French proposals, as revealed in the EPA paper, were disparagingly described as "synthetic" and "dubious."[398] Curiously, in one of these measures, the French statisticians propose to divide total costs by the average wage rate, in an effort to determine the "integral productivity of labor " – as if measures had to relate to labor nevertheless, despite the inclusion of additional factors of production. Kendrick criticizes the measure, arguing that:

> … non-labor cost so deflated need not yield a true measure of other factor input. Insofar as productivity has increased in the production of materials and capital goods, prices of these would fall relative to wage-rates; thus, "labor equivalent input" would have a downward bias, and the productivity measure an upward bias – although this might be offset (or augmented) by changes in the interest rate.[399]

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[395] Ibid., p. 547
[396] This point is discussed in Kendrick (1956). In fact, "productivity" as a surrogate measure for the quality of life has long maintained currency among statisticians (and politicians), particularly, in the context of value-added measures, which are assumed to move in parallel with income levels. See Ibid., p. 12
[397] The French may have coined the term, but the first measures of total factor productivity are traced to a little known work by the Dutch economist, Jan Tinbergen written in the mid-1940s. The first US study is credited to the American economist, George Stigler, written for NBER in 1947. See John W. Kendrick and Beatrice N. Vaccara, eds. (1980), *New Developments in Productivity Measurement* (out-of-print volume by NBER), pp. 2-3. Available at: http://www.nber.org/books/kend80-1
[398] Ibid., p. 547. Never mind the flaws intrinsic to the various American measures under consideration at the time!
[399] Ibid., p. 547

Although the criticism follows clean logic, the real question that remains is what, exactly, the measure represents. The problem is not merely the fact that non-labor factors of production are deflated by wages, but the idea of using the average wage across products assumes that movements of the average can parallel movements in labor productivity. And, more fundamentally still, when cost becomes factored into the equation the link to physical output makes for elusive, or at least, ambiguous interpretation. Still, the introduction of capital as an input, again, represents a further discursive shift, from man to process with regard to how productivity was conceptualized.

The role of valuation in productivity ratios: the price/wage debate during the post-war years. It is a kind of irony that the earliest, most primitive measure of productivity – physical output per input of labor – was also an "ideal" measure, of sorts. As seen in previous sections, much of the statistical effort that ensued represented attempts to get back to physical output, and where not possible, proxies were proposed. In the late 1930s, the prominent economist, Frederick C. Mills,[400] discusses the issue of valuation in an article that addresses the relationship of prices to productivity measures. In this article, Mills is careful to distinguish between the raw productivity measure – output per input – and valuation: increased productivity implies that more is available for less, with prices and wages serving as the arbiters of benefit distribution.[401] Whereas some statisticians simply assume that markets provide the correct signals for efficient reward distribution, Mills is careful to parse data available and trace the gains to different producer groups and consumers, for a particular industry. For Mills, the following variables are needed to create a clear picture of production and its rewards:[402]

[400] Frederick C. Mills (1892-1964) was affiliated with NBER and influential in the debate on productivity statistics, long during the postwar years.
[401] Frederick C. Mills (June 1937), "Industrial productivity and prices," *Journal of the American Statistical Association,* 32:198, pp. 247-262
[402] Ibid., see pp. 249-256 for a detailed explanation of the calculations.

***Ideal measure* • proxy**

Physical output (Q) • no proxy

Energy spent (E) • man-hours worked (MH).

The sum of total product sold (S) • value-added (VA)

Index of prices of goods and services sold by[403] *consumers of products, Q (P_1)* • no proxy

Index of prices of goods and services bought by producers of goods, Q (P_2) • no proxy

In a hypothetical example, Mills calculates the increase in productivity (Q/MH) and relates the gain in productivity over two time periods and compares this gain with real sums paid by consumers, ($S/P_1 = S_1$). If the quantity of goods received by consumers exceeds the quantity of goods and services expended by them, consumers are said to have benefited by the percentage difference. In this example, with (E/Q) declining by 20 percent, and (S_1/Q) by 4 percent,[404] it is calculated that producers captured 80 percent of the gain because for this calculation, the total sum of product sold, (S), is deflated by (P_2) to give (S_2), and in the example (P_1) = (P_2).

To look at more specific groups within the producers of value-added, Mills also includes the total wage bill (W) to then calculate a series of figures to show to what extent wage workers gained or lost relative to changes in productivity (comparing 1923 and 1929, and then again, 1933 and 1935). During the first time period, with aggregate real rewards indicated by ($W/P_2 = S_2$) workers real wages per hour (S_2/MH) increased less than productivity, (Q/MH); in the second period, they were calculated to have exceeded productivity. The focus on wages and benefit distribution comes at a time when labor unions were relatively powerful.[405] Discourse theory[406] would predict that power interests and the wider social context

[403] As noted: "Through the sale of these goods and services consumers acquire the sum *S*, wherewith to buy the products represented by *Q*." Ibid., p. 249
[404] In this hypothetical example, S_1 (index of aggregate effort expended by consumers in acquiring this sum) increases by 72.8%, while Q increases by 80%; hence the 4% gain to consumers. Ibid., pp. 250-251
[405] See, for example, George W. Brooks (1950), "The worker and his organization," *Monthly Labor Review,* 70, HeinOnline, pp. 40-47

would be represented in various discursive elements – here, in the way productivity statistics were conceptualized and constructed. The fact that this scholarly work focuses on distribution issues at a time when organized labor is quite powerful is interesting to note.

The meaning of social distribution. In Mills' work, the raw measure of productivity is a number; meaning derives from economic distribution. Hence, productivity is now more than a number. Added to the meaning of social distribution is the notion of economic stability: economies that are most stable, according to Mills, are those where gains/losses are widely diffused across consumers, workers and producers.[407] In terms of wage and price policies, however, no clear edict exists (either then or now) among scholars. For example, in a speech delivered by Albert Rees[408] in 1969 at the University of Chicago, the economist from Princeton lists his objections to a policy tying wages to productivity – as advocated by the Eisenhower and Kennedy Administrations. Like Mills, Rees assumes that productivity must be defined by the raw measure, output per man-hour. Rees notes that this measure of labor productivity is misleading because many factors can cause an increase in output, beyond capital, such as better quality raw materials and technology.[409] In fact, Rees lists many reasons for why wages simply do not track productivity changes, including the extensive wage bargaining agreements struck at the time and fringe benefits, which had become an increasingly important component of wages. The fact the wage policies were considered to be important during the Kennedy and Eisenhower administration testifies to the fact that markets were not trusted to bring wage increases in line with productivity improvements. Rees, in any event, argues that such a policy would result in similar work being rewarded at different rates, because of the unevenness of productivity across sectors, corporations – all levels of the economy, in fact. Moreover, he reasons that such policies would have resulted in higher price levels for goods experiencing rapid technological changes (and, implicitly rapid

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[406] See, for example, Jennifer Milliken (1999), "The study of discourse in international relations: a critique of research and methods," *European Journal of International Relations,* 5:2, pp. 225-254

[407] Ibid., p. 262. Economic theory suggests that wages move in line with productivity changes. Economists debate this relationship even today, admitting that the relationship holds true only under certain simplifying assumptions.

[408] Albert Rees (1921-1992) was a labor economist, who served on the New Council on Wage and Price Stability in 1974 during the Ford Administration. He was also President of the Alfred P. Sloan Foundation and a Provost of Princeton University.

[409] Albert Rees, "Productivity, Wages, and Prices," in a speech delivered at the University of Chicago, Graduate School of Business, April 18, 1962. The speech is available at: http://www.chicagobooth.edu/faculty/selected papers/sp1.pdf See pp. 2-3

productivity growth); he cites the development of television as an example. At a more conceptual level, he uses the example of his profession: if teaching more students per class is considered to be "productive," (and hence rewarded at a higher level), the effects of long-term productivity in terms of education quality would be deleterious.[410]

What this discussion suggests (in addition to the apparent focus, at the time, on wage policy) is that the simple surrogate, wage cost, as a way of measuring productivity, however interpreted, is misleading. Once wages are included in the measure of productivity, meaning, again, is linked with distribution issues. Rees is also getting at an important issue with his education example in that he is implicitly challenging our notions of what productivity *means* to an economy at another level. It is not simply the difficulty of measuring the "productivity" of a service, but his simple example implicitly questions how we value it and what effects valuation may have on outcome.

In fact, Mills, too, addresses these issues, noting that even quantitative measures are misleading when quality of the product has altered – only quality in terms of "efficiency," according to Mills can be accounted for in the numbers. Quality of labor is difficult to incorporate into measures, and weighting by wage costs (discussed earlier) is not considered to be reliable – the proportion of direct versus indirect labor is also a confounding factor in attempting to measure "productivity," in terms of output versus man-hours invested. [411]

During the postwar years, the notion that wages should be tied to productivity reflected a policy trade-off between rising national income and price levels. It was a conscious choice and valuation. In an article written by CEA staff members during the late 1940s, economists John C. Davis and Thomas K. Hitch argue that rising income levels are preferable to declining price levels for several reasons, one being the direct way in which labor organizations could influence wages and make them correspond to productivity

[410] Ibid., pp. 4-5
[411] Mills (June 1937), p. 258. The issue of direct versus indirect relates to the amount of "labor" embedded in capital equipment, for example.

increases, whereas no such "organized" body was available in the market, either on the part of consumers or sellers to "force" a price decline in return for higher productivity. More generally, the authors assert that rising incomes and stable price levels provide greater business stimulation than do stable incomes, offset by declining price levels. [412]

Clearly then, at least according to post-war economists, there is no automatic switch in the market linking wages or price levels to productivity. Choices are made. Davis and Hitch discuss alternative measures of productivity, the first being average productivity movements by economic segment. This statistic is considered inferior, partly because "productivity" cannot be measured in some sectors, such as government. Additional problems with the measure include distributional issues, whereby productivity increases can be offset by the expense required to achieve them.[413] This line of reasoning again implicates an ambiguous conception of productivity, insofar as the term does not so much relate to efficiency as to the distribution of gain. Davis and Hitch instead support a statistic measuring total man-hours of work to total (real) output.[414] We are, once again, back to the raw concept of output produced per man-hours invested – the ratio reflects aggregate volume of production only insofar as accurate data are available to eliminate pricing effects, a point the authors concede. Even if issues relating to the missing measurement of quality and basing a wage policy (as the authors recommend) on the basis of these *grossly aggregated* statistics are taken into account, further assumptions must be made in order to draw the correspondence between increased output per input and the level at which to increase wages: that the increased output volume does not stem from factors of production beyond labor. In fact, the relationship proposed makes this assumption implicit:

> Should wages be related to productivity change in the ratio of 1 to 1, 1 to 2, 2 to 1, or in some other ratio? If the purpose were to achieve by wage changes and the other supporting means mentioned earlier a redistribution of income in favor of wage earners, then nearly a 2 to 1 relationship may be in order – for compensation of employees in the economy amounts to not much more than one half of total gross national product. In this event, a 3 percent increase in the ratio of total output to total man-hours would permit nearly a 6 percent average wage increase, thereby leaving the remuneration of the non-labor factors of production unchanged in absolute amount and decreased relative to employee compensation.[415]

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[412] John C. Davis and Thomas K. Hitch (November 1949), "Wages and productivity," *The Review of Economics and Statistics,* 31: 4, p. 293.
[413] Ibid., p. 295
[414] Ibid., p. 295
[415] Ibid., p. 296

Were it so simple: a unitary economic entity. The conundrum here is not that a crude aggregate figure is calculated, as cleanly as possible, to provide a rough estimate of total production volume. The paradox lies in the power of this crude calculation potentially to trigger policy action, on the basis of grotesquely simplified assumptions. In fact, as mentioned before, by linking the greater production volume to wages, the guideline effectively links greater production volume to labor; in reality, the gauge reflects a distributional issue, which is to suggest by how much labor should benefit from the gains achieved[416] – whether or not labor produced them (or whether they reflect altered capacity utilization, for example). Davis and Hitch concede that a wage increase set in relation to the increase in production levels should be a guideline, only for wage negotiations, leaving specific labor pacts in the realm of particular firms and industries.[417] Still, once a figure becomes so linked to labor, the figure acquires stature and legitimacy: it reflects the fruits (or deficits) of labor.

But what kind of labor do these figures reflect? Output per man-hour, even if accurately calculated, would measure direct labor. As noted in the literature, indirect labor, from supervisors to distributors, are not reflected in these figures. An article published in the mid-1930s claims that 75% of all gainfully employed individuals in 1870 produced physical goods; that figure declines to 50% by 1930.[418] With financial and commerce employment considered to be "non-self-supporting," productivity, clearly, must rise not merely to compensate production workers and increase incomes; productivity gains must cover the "non-productive" portion of the workforce, as well. Productivity still relates only to the physical world.

Technology and productivity measures during Fordism

In Florence's 1920 article on labor productivity, quality was associated with the accident rate, indiscriminately documented, which translated into less output being produced than the maximum potential. Can quality be associated with technology? Taylor's seminal work does not address technology,

[416] This assertion is not so much an "equity" argument, as one that may consider the amount of income workers require to support increased goods production.
[417] Ibid., pp. 297-298
[418] Willford I. King (June 1933), "Are we menaced by machines?" *Journal of the American Statistical Association,* 28:182, p. 221.

per se, but it repeatedly presents the way in which man can be directed to maximize production as scientific. Technology, although defined differently over time, has long been imputed as the elusive element causing productivity growth. In the case of Florence's article, a lower accident rate could be linked to higher technology – there was little to discriminate among products and the labor that produced them. Avoiding accidents, thereby maintaining the speed of production, was a charge placed upon man. It was technology because it was associated with the maintenance of maximized production.

The meaning of technology, like the larger term productivity itself, has shifted over time. In an article written during the late 1930s, BLS statistician Boris Stern, implicates a broader definition of technology:

> Technological changes or rather technological improvements (since all changes are for the sake of improvement) include any and all changes in the nature of the product, method of production, type of labor, hours of work, machinery and equipment used, etc., which result either in an improvement in the quality of the article produced or in an increase in the output per unit of labor time. It is conceivable that an improvement in the quality of the product may readily result in a decrease in the output per unit of labor time, thus actually increasing the volume of labor required for its production. Essentially, however, the object of improved technology is to reduce the labor costs of operation.[419]

Here, the technology that brings about a better quality *should* result in lower labor costs. Like quality as noted by Florence, technology during the beginning years of Fordism, it seems, meant anything that improved the output outcome. But the vantage point now widens to include process and product. Improvements in the productivity statistics were equated with changes in the technology factor, which meant, essentially, "everything." When the focus shifts to process, more factors can be included in the analysis than a concentration on "man."

The concern with technology during this time was, not surprisingly, related to worries about unemployment, as evidenced by the title of Stern's article. In a later article, Arthur Wubnig addresses the mistake of attributing labor productivity gains to technological factors and then drawing conclusions about its probable effects on employment.[420] Indeed, Wubnig rather candidly describes the myriad factors contributing to labor productivity and the consequent confusion in the field: "This list of factors is long; the

[419] Boris Stern (March 1933), "Technological displacement of labor and technological unemployment," *Journal of the American Statistical Association,* 28:181, p. 43
[420] Arthur Wubnig (June 1939), "The measurement of the technological factor in labor productivity," *Journal of the American Statistical Association,* 34:206, pp. 319-325. Wubnig wrote on industrial relations and the National Labor Relations Review Board during the 1930s; his work is widely cited.

inter-relationships between individual factors most complex; the difficulties of correlation, multifold and stubborn."[421] He then uses this epiphany to then cast doubt on any comparisons of "labor productivity" over time. Wubnig agrees that certain "technological" processes, such as increased specialization and mechanization, affect the level of output per man-hour of work – changes in production processes that are considered to be "more or less permanent."[422] But the author then concedes that one of the most important elements influencing labor productivity statistics is simply, "operating levels." Because operating levels can vary drastically during cyclical downturns/upturns, the author suggests that productivity comparisons be made only during years of comparable plant activity. This reasonable cautionary note can be applied for wars and depressions; it is more difficult to apply for changes in demand, which can be subtle, but influential (e.g., increased demand for electronic components after the invention of television).

Other factors implicated in distorted interpretations of productivity include, according to Wubnig, "maintenance and repair," as well as "plant overhaul."[423] Wubnig takes the example of the railroad industry: "The fluctuations of the factor of maintenance and repairs are here so large, from one cyclical phase to the next, as to enshroud deep ambiguity the significance of estimates of labor productivity based on traffic-units alone as the measure of total output.[424] Other confounding factors that influence labor productivity include different production techniques, each with separate labor requirements to achieve the same outcome (strip mining versus underground mining to extract iron is the example given); the quality of input materials; and, the composition of output in industries with varying mixes of output to mention a few.[425] Thus, although it was clear that direct associations could not be made between labor requirements and technology, admitted, at least, among some statisticians, it remains remarkable that "technology" could be reduced to an indiscriminate marker of "displaced labor," as a general concept. It counts as a clear and important shift in the discourse on technology as it relates to productivity.

[421] Ibid., p. 321
[422] Ibid., p. 321
[423] Ibid., pp. 322-324.
[424] Ibid., p. 323
[425] Ibid., p. 324

Pricing issues and productivity

In the mid-1970s, John Kendrick,[426] at the center of the statistical debate during the postwar years, proposed the following relationship between productivity and prices:[427]

$$\frac{O}{I} = \frac{Y/P_0}{Y/P_1} = \frac{P_1}{P_0}$$

In this equation, (O) = final output/real product; (I) = input; (Y) = national income and national product;[428] (P_0) = average product prices; and (P_1) = average price of inputs. The equation suggests that the raw measure of productivity – output per input invested – changes in proportion to the average price of inputs divided by the average price in products. In other words, relative productivity changes in an economy correlate with relative changes in factor unit costs and product prices – it is definitional. [429]

The arithmetic, were all assumptions to hold, works out neatly enough. But the identity exposes the ambiguity in the way the ratios can be interpreted to mean "productivity." For example, this identity can be interpreted to suggest that as prices decline, demand increases, which then positively influences sales and output.[430] Kendrick supports this reading with regression results indicating that industries with high productivity gains, on average, show high employment increases. If, on the contrary, input prices increase – say wages rise reflecting higher marginal productivity,[431] as economic theory would predict – then workers will have greater purchasing power. Either way – through lower product prices or higher input prices, productivity increases. Is this productivity? It is, if that is how it is defined.

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[426] John W. Kendrick (1917-2009) is credited with many achievements in the field of productivity measures, joined NBER in 1953 and was chief economist for the Department of Commerce from 1976-1977 and a Professor at George Washington University from 1955-1988.
[427] John W. Kendrick (1977), *Understanding Productivity: an introduction to the dynamics of productivity change,* Baltimore, MD: The Johns Hopkins University Press, pp. 76-77. Note: this article is written far beyond the post-war years, but it helps explain distributional issues, as well as showcases the importance of pricing issues that are integral to productivity statistics throughout the 20th century.
[428] The author claims that, "…national income equals national product when indirect business taxes less subsidies are subtracted from product, so that it equals the gross factor costs required to produce it." Ibid., p. 76
[429] Under conditions of competitive equilibrium, price (p) = marginal cost (mc), and under constant returns to scale, mc = average costs (ac). Were these conditions to hold, a way to get at productivity growth would be to calculate the rate of change of output to input prices. This cost-savings approach by definition indicates wage cost to be a valid measure of input, given stated conditions.
[430] Ibid., p. 8
[431] If this were the case, then the productivity debate could be settled: labor productivity is equated with average wage cost (assuming constant returns to scale).

The evidence presented – employment gains in industries with high productivity – could suggest that high productivity gains translate into lower product prices, which in turn results in greater demand and, consequently, higher production levels. In this case, the heightened demand must produce a stronger effect on outcome than the fact that labor is now "more productive," with the net result being that more workers are (nevertheless) needed. In some sense the most dubious assumption of the relationship is simply that price drives demand uniformly. Price-demand sensitivity, of course, is not the same for all industries and products. And, the outcome must be predicated on the notion that markets cannot become saturated. The outcome also fail to take into account shifts in consumer demand curves – the decline of Hummer production is a case in point, where prices can decline, reflecting a costlier vehicle to drive, but consumers do not respond to the trade-off. Or, the cost decline can reflect a new social norm of environmentalism that overpowers the change in material constraints – the price of gas. Last, changing levels of product quality are not reflected in this equation – a major reason for why the equation is deceptively neat. More durable products, for example, that translated into higher product prices, on average, would diminish the overall level of "productivity" unless the average price of inputs increased to an equal extent or rose in proportion to average product prices (reflecting their improved productivity, defined in terms of quality). But markets do not automatically attach "objective numbers" to higher quality; price partly depends on how consumers value what is perceived to be higher quality.

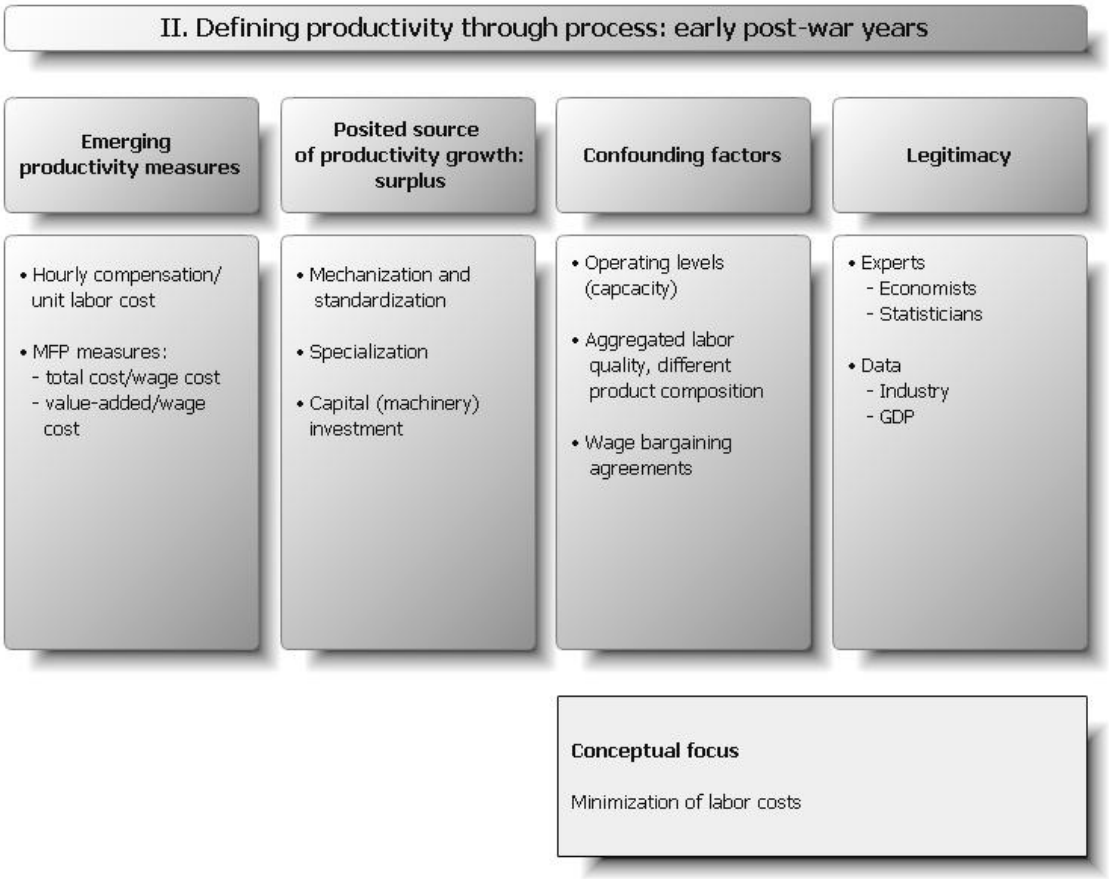
The identity is arguably not so much intended to be a mathematical derivation of productivity, as a guidepost for policy. Kendrick explains that the CEA set non-inflationary average wage increases at 3.2 a year, calculated from average "trend-rate" increases in real private product per hour.[432] But the aggregate figure, as an already tenuous guidepost for diverse industries, could not withstand forceful shifts in economic conditions, such as heightened deficit spending and a consequently (as claimed) inflationary economy linked to US involvement in Vietnam. [433] Hence, the usefulness of such an identity to help guide policy would seem limited, unless the world hovers in a virtually static state, or in equilibrium (in which case, the need for policy is questionable). Likewise, if the labor market were self-equilibrating, policy

[432] Ibid., p. 77
[433] Ibid., p. 78

would be redundant or would serve to skew what the market could theoretically achieve on its own. (Pricing issues are further discussed in the next sections. The way in which prices influence productivity statistics is presented here to introduce the challenges they present in interpreting what the statistics represent.)

Key elements of the productivity discourse during the early post-war years are presented below (figure 4.2).

Figure 4.2



3. Linking productivity to material product

The years leading to post-Fordism and productivity statistics: the beginning of hedonic price indices. During the postwar years, policy, particularly in the United States, emphasized the production of "more."[434] Technology, however conceived or contentiously debated, was linked to whatever reduced labor requirements per unit of output. The question of the day was: can wages keep pace and nourish growing consumption patterns? In a post-Fordist[435] world, production took on another meaning and with it, so did productivity. But, as the 1960s approached, technology was not only the facilitator of a generic "more," but of better-quality "more." Productivity statistics still attempted to measure output per input invested. But the way in which these factors were measured, and, more importantly, the meaning attached to them, had shifted perceptively in the scientific literature. Products and labor became more nuanced, and with this, so did productivity statistics and their interpretation.

In 1961, a commission headed by George Stigler presented a study on price indices to President Kennedy in which the failure of these indices to take "quality changes" into account was singled out as their largest deficit, with price indices grossly upwardly biased as a result.[436] This issue gained momentum over time, greatly accelerated by the work of Zvi Griliches,[437] who developed new measures of quality change over time. In one noted study about quality change in automobiles, Griliches, together with Irma Adelman,[438] developed a new index to take account of quality changes and used regression analysis to estimate the influence of quality on prices, a technique now referred to as hedonic regression (from which are derived hedonic indices).[439] In an article describing their technique,[440] Griliches and Adelman lament the "arbitrary

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[434] See Collins (2000).
[435] This study will mainly cover post-Fordism from the 1980s and on, when information technologies figured prominently in the quantitative discourse on productivity.
[436] This claim was made in a quote taken from Daniel Patrick Moynihan (June 1999), "Data and dogma in public policy," *Journal of the American Statistical Association,* 94:446, p. 361
[437] Zvi Griliches (1930-1999) was a noted professor of economics at Harvard University (and member of staff at NBER), who also served on the Stigler Commission in 1961. Griliches' work has been central to the development of productivity statistics.
[438] Irma Adelman (1930 –) is a professor of agriculture and resource economics at University of California, Berkeley.
[439] Although economists from earlier dates carried out hedonic regressions, the technique did not become widespread (and controversial) until the latter part of the 20th century. Zvi Griliches credits Fred Waugh with early work (1928) in the field, beginning with his Columbia University dissertation on vegetable prices. See Zvi Griliches "Hedonic Price Indexes and the measurement of capital and productivity: some historical reflections, in Ernst R. Berndt and Jack E. Triplett, eds. (1990), *Fifty Years of Economic Measurement: the jubilee of the conference on research in income and wealth* (Studies in Income and Wealth, volume 54, NBER), p. 185
[440] Irma Adelman and Zvi Griliches (September 1961), "On an index of quality change," *Journal of the American Statistical Association,* 56:295, pp. 535-548.

nature"[441] in the way quality adjustments are made in price indices – generally in an attempt to isolate the effects of inflation. Until the time of this publication, according to the authors, the BLS had adopted two methods to make these adjustments: (1) products are subdivided into new goods categories, based on quality differentials and (2) new products were "spliced" into the price index as they replace older versions. As Griliches and Adelman point out, the first method multiplies the number of indexed items to a daunting level, whereas the second method makes too many assumptions regarding the relationship between quality and price. For example, the way in which new products are judged to be on equal par with the replaced items injects a fair level of subjectivity into the process, and with the assumption that the products are identically specified, the change in price is attributed uniquely to an inflationary cause. The second method may also "splice" new, improved quality products into the index, and the assumption in this case is that the price differential is attributed solely to quality.[442]

These assumptions must be considered in light of how quality was considered to influence productivity measures earlier in the century: mainly as *anything* that lowered production costs. Here, the switch to another meaning of quality is significant, for it is the product, i.e., not the production process, which has become the focus of attention. Different products provide various levels of satisfaction, as evidenced in consumers' marginal rates of substitution. That is, price indices need to extricate the portion of the price increase that reflect the amount of money consumers are willing to pay in order to obtain a higher quality product. Productivity statistics that use price deflators to make output calculations can now increase, as a reflection of greater quality goods. The meaning of productivity is now associated with a standard of living that has moved beyond more. The question now is: more of *what?*

Griliches and Adelman concede the difficulty of attaching proper weights to various quality characteristics of particular products, as well as how to single out the traits of greatest "value" – the fat content for milk, was one hypothesized quality trait.[443] (Curiously, this particular example is rather revealing in that the

[441] Ibid., p. 535
[442] Ibid., pp. 535-536.
[443] Ibid., p. 537

definition of "quality" is quite particular to a specific point in time and cultures – today fatty milk would not necessarily be considered of greater value than fat-reduced milk!) Given the difficulty of assigning weights to designated quality traits, Griliches and Adelman state the question they wish to answer: "How much additional money would the average consumer have to pay in the base year in order to get a basket of goods identical with the one he purchased in the base year, except that the qualities available are those of the given year?"[444] To answer this question, the following index[445] is proposed and lays the basis for hedonic regression:

$$dp_i = dp_i' + \sum_j \frac{\partial p_i}{\partial \alpha_{ij}} \cdot d\alpha_{ij}$$

In this equation, dp_i stands for changes in price in the "ith" commodity. Griliches and Adelman aim to isolate dp_i', or price "movements" that have quality changes extracted from it. As such, dp_i' would reflect true inflation. The way to isolate this effect is to calculate the second term in the equation, which, essentially, is an attempt to measure the marginal rate of substitution, per a change in quality ($\partial p_i/\partial \alpha_{ij}$, see footnote 444), multiplied by the change in quality, summed over the products and product traits in question. The use of partial derivatives permits this formulation to be recast as a regression analysis, in which the effect of one variable on outcome is measured, while other variables are held constant. Griliches and Adelman then choose three main quality indicators (α_{ij}) – horsepower, weight, and length[446] – and a host of dummy variables, measuring indicators such as powers-steering and V-8 engine. Noting that the "true" functional form of the regression cannot be known *a priori,* Griliches and Adelman make the assumption that log p_i is linearly related to the indicators being measured, they run regression using data on 95 different automobile models in 1957. Because the equation is semi-logged, the resulting coefficients, $\partial p_i/\partial \alpha_{ij}/p_i$, can then be interpreted to mean "…the percentage change in price due to unit change in a particular quality."[447]

[444] Ibid., p. 538
[445] Ibid., p. 539. The index, as it appears in the text, has been misprinted. The marginal rate of substitution, price/quality, is given by: $\partial p_i/\partial \alpha_{ij}$,, not $\partial p_i/\partial d_{ij}$.
[446] As with fatty milk, car criteria have been subject to consumer preference changes.
[447] Ibid., see pages 540-541.

The results then have to be related to the CPI in order to isolate dp'_i, which Griliches and Adelman do through a series algebraic computations.[448] The important part of the exercise, however, lies in using regression analysis as a basis of calculating quality changes and how consumers value them. Assuming a linear relationship between the log of price and selected quality indicators implies no minimum and no maximum values attached to such indicators. As "length of automobile" constitutes one of the quality indicators, whose effect on price is being measured, it suggests that the effect of a longer car can positively affect price indefinitely. Math is sometimes a poor surrogate measure of human needs and wants, and the attempt to quantify these elusive measures, however proximate, is not here at issue. The issue is how these measures become interpreted; once presented in number form, they tend to reflect the unquestioned meaning to which they are attached. Clearly, with a lowered CPI as a result of extricating the changes in price due to quality, production outcome will be seen as "larger." The measure means, implicitly, that longer cars make us "more productive" because we value longer cars. The meaning of productivity has now so obviously changed with this new and accelerating drive towards the incorporation of "quality" into price indices – meaning is nearly completely detached from the individual producer. Productivity is linked to relative valuation: what price are consumers willing to pay for a longer car?

Griliches and Adelman calculate price changes for automobiles after subtracting the portion of the price rise attributed to changes in quality and claim that, even if quality adjustments are made for this single commodity *alone*, they can diminish the entire CPI increase from 1947-49 by roughly 9%.[449] Deflating GDP by a lower price index would have caused productivity statistics to rise. In a footnote, Griliches and Adelman claim that such adjustments, had they been heeded, could have prevented the Federal Reserve from tightening monetary policy, reasoned to have precipitated the 1960 recession. Even more boldly, the authors claim that Republicans would have won the election, had the "correct" price index been watched.[450] In other words, the faulty index made history.

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[448] The resulting "polygenetic index" is given by: $\frac{p_i}{p_0} - \sum_j \frac{\partial p}{\partial \alpha_{ij}} \frac{(\alpha_{ijt} - \alpha_{ij0})}{p_0}$. Ibid., p. 545

[449] Ibid., p. 545

[450] Ibid., see footnote "22," p. 545

But the meaning of the index extends to concepts beyond production, and Griliches and Adelman explore the connection between the quality index and an index of "constant consumer satisfaction."[451] For this concept to hold water, the authors assume (1) quality to be a continuous variable[452] and (2) no direct substitutability between quantity and quality. With a little algebraic manipulation, it is shown that the, "marginal rate of substitution between quality characteristics of the same commodity must be proportional to the ratio of their 'quality prices' … in equilibrium, the relative weights in the index of different quality dimensions of a given product are equal to the ratios of the increments in satisfaction to which they give rise."[453] This conclusion, naturally, is premised on the condition that prices are free to adjust.

How would this relationship between utility and quality relate to productivity? It relates, conceptually, to valuation. More technically, the relationship is meant to show that a price deflator that incorporates quality dimensions can then correspond to the assumption of "constant consumer utility," which undergirds the prices indices (at least in the United States). But where do preferences come from? Exogenously, it seems, and fully in line with neo-classical microeconomic theory. Griliches and Adelman acknowledge that problems with the index arise when an advertiser "… successfully alters tastes,"[454] with the introduction of new quality characteristics. In this case, "… it is not clear whether the original or the new preference patterns should be used to evaluate the quality index."[455] Presumably, the preference patterns are calculated based from the hedonic regression analysis. And, the formulation of the problem suggests that consumer preferences are fairly steady, which would facilitate the calculation of hedonic price indices. But, if consumer preferences were thought to be steady, why would advertisers bother? And, if, on the contrary, consumer preferences change frequently, how practical would it be to continue adjusting the index?[456] Can only advertisers alter tastes? Real output, from which productivity statistics are calculated, is based on

[451] Ibid., pp. 546 -548
[452] According to the authors, this assumption makes the index valid only for small (i.e., not discrete, step-wise) changes. The IT revolution was, evidently not foreseen at the time!
[453] Ibid., p. 547
[454] Ibid., p. 548
[455] Ibid., p. 548
[456] The authors claim the "ordinary" CPI confronts this "unsolved problem," partially solved by the use of chain indices. Ibid., p. 548

valuation,[457] whether or not quality changes are taken into account. But, the valuation is a given, whether determined for the "average" consumer on the basis of a hedonic regression analysis. Consumers may be free to help determine valuation, as a function of what they demand, but in the same way that productivity is defined as output per input, in raw form, what consumers demand is presented as a given, not socially constructed, or endogenous to the system. Or, even, subject to exogenous shifts over time.

"Shifts" versus "movements along" the production function: the mid-century debate and its implication for meaning. In the late 1950s, Robert M. Solow,[458] published an article in which he proposes to separate technology advances from changes in capital input to account for output change.[459] The ultimate purpose of the paper is to show how to discern "shifts" in the production function,[460] where higher output is attained, per given input, as opposed to "movements along" the production function, which can be traced to changes in the mix of inputs invested in the production process. Confessing to grievances about the *aggregate* production function, generally, Solow proposes the following function: $Q = F(K,L; t)$, where Q represents output, K and L are physical inputs of capital and labor, respectively; "*t*" is noted to be "technology," but technology defined as *any* cause for a shift in the production function.[461] Shifts in this production function are attributed to "neutral" technological change, defined by constant marginal rates of substitution. As an economy grows, "*t*" produces cumulative effects, represented by $A(t)$, which gives way to the aggregate production function, $Q = A(t)\, f(K,L)$. By differentiating this function, and defining the relative share of capital (w_k) and labor (w_l) to be $\frac{\partial Q}{\partial K} \cdot \frac{K}{Q}$ and $\frac{\partial Q}{\partial L} \cdot \frac{L}{Q}$, respectively, Solow determines that

changes in output can be calculated as:[462]

$$\frac{\dot{Q}}{Q} = \frac{\dot{A}}{A} + w_K \frac{\dot{K}}{K} + w_L \frac{\dot{L}}{L}$$

[457] Weights attached to different product groups reflect their importance relative to GDP, for example.
[458] Robert M. Solow (1924 –) was Professor Emeritus at MIT until January 2011, having joined the faculty in 1949. He served as a senior economist for the CEA from 1961-62 and was awarded the Nobel Prize in Economics in 1987.
[459] Robert M. Solow (August 1957), "Technical change and the aggregate production function," *The Review of Economics and Statistics,* 39:3, pp. 312-320.
[460] The function is, as usual, assumed to have constant returns to scale.
[461] Ibid., p. 312. By defining "technology" to be the cause of *any* shift, "technology," as noted by Solow, can include changes in the pace of production and a better educated workforce, for example.
[462] Ibid., p. 312. The author here uses Newton's notation for differentiation.

From this equation, and assuming that Q/L =q; K/L = k; and, $\frac{\dot{q}}{q} = \frac{\dot{Q}}{Q} - \frac{\dot{L}}{L}$, it follows that: $\frac{\dot{q}}{q} = \frac{\dot{A}}{A} + w_K \frac{\dot{k}}{k}$.[463]

Solow bases his productivity statistics on this identity; specifically, he wants to measure the shift in production, or $\frac{\dot{A}}{A}$. But in order to do this, Solow must make several assumptions about how to measure capital and capital shares (using "non-farm private GNP per man hour" follows from the definition, q = Q/L and is standard, if questionable, because of aggregation issues).[464] Solow first regrets that he has data only for capital stock, as he reasons capital services would provide a better estimate.[465] The author is more perturbed by the lack of data for idle capacity; he takes a crude measure of unemployment as a way to adjust capital usage, which he admits to be a poor proxy – but better than no proxy at all. The share of capital, or w_K, is "…pieced together from various sources and ad hoc assumptions."[466] From these data, the shift in production is calculated as $\frac{\dot{q}}{q} - w_K \frac{\dot{k}}{k}$.

With this formula, using 1909 as a base year, Solow calculates *A(t)* to have increased from 1.00 to 1.809 in 1949. He uses this spread to argue that technology changes – or production-function shifts – have exhibited an average annual increase of roughly 1.5%, nearly constant over time.[467] This means: GNP per man-hour, minus technology change, would be calculated by dividing the real GNP per man-hour by the cumulative production shift at that date. What does the figure tell us? In fact, not too much, if constant returns to scale are assumed: as either capital or labor increases, so does output by the proportionate amount. By contrast, having a figure by which to demonstrate technical change could, arguably, be a way to isolate "progress." The assumptions made in order to facilitate the calculation can be questioned, by the Solow's own admission; moreover, the numbers produced are difficult to explain: if we are measuring "progress," we

[463] Ibid., p. 313. This follows assuming that $w_L = 1 - w_K$ as capital and labor are the only factors of production.
[464] Errors of aggregation and their impact on productivity statistics are discussed following this summary of Solow's model.
[465] Solow argues that capital stock could rise as old machines are replaced with new ones, counting as an increase in stock, though services, under this scenario would remain constant. Ibid., p. 314
[466] Ibid., p. 314
[467] Ibid., p. 316

would expect a slow increase, if only for reasons of "learning." Why, then the declines that are exhibited in the data series? Solow admits that the data show breaks at around 1930, but in fact, declines in $\frac{\dot{A}}{A}$ are also evident in 1914, 1916, 1919, 1936, 1944, and 1945.[468] Solow assumes the break during the 1930s may simply reflect accelerated technology change, qualified as "broadly interpreted."[469] Given Solow's reservations about the way in which "idle capacity" is proxied, it stands to reason that the breaks observed could simply reflect historical switch-points[470] that affected capacity utilization – not "technology" per se. Indeed, the declines occur around World War I, the Great Depression and World War II. Of course, the declines could also reflect measurement error. But, at a more interpretive level, if world events do cause changes in the speed of production processes, or in capacity utilization, would it not be misleading to implicitly interpret these changes that result in a production-function shift in the production function – *for these reasons* – as "progress"? Given the assumptions, the math is neatly accurate. But meaning can be negotiated.

In fact, Griliches explores this very issue – the influence of world events on productivity figures – in an article that attempts to explain the precipitous drop in productivity measures observed in the US and other industrialized countries during the mid-1970s.[471] Griliches first tries to account for the slowdown by analyzing the effects of R&D on the manufacturing sector (where he presumes the effects to be most measurable and present, compared with most other economic sectors). Dealing with the difficult issues of R&D spillover and capacity utilization, Griliches proposes an econometric model in which he attempts to measure the impact of R&D, relative to labor, physical capital and "disembodied technical change."[472] The coefficients generated for R&D, he claims, are too small to account for the observed decline in productivity growth. Interestingly, although the author surmises that the economy was undoubtedly not fully utilizing

[468] Ibid, see Table 1, p. 315. The break at 1930 most likely refers to declines in 1925, 1926, 1927, and 1929, followed by an increase in 1930.
[469] Ibid., p. 316
[470] Historical switch points are here loosely defined to be those, where productive capacity would alter significantly (e.g., war and depressions).
[471] Zvi Griliches (Fall 1988), "Productivity puzzles and R&D: another nonexplanation," *Journal of Economic Perspectives*, 2:4, pp. 9-21.
[472] Ibid., p. 14. "Disembodied technology" is defined to be that which results in a *shift* of the production function.

capacity during the hike in energy prices, he admits that, "When society is not at the frontier, we cannot really tell what is happening to it."[473] How do we know when society is at the frontier? What is maximum production? Does this mean full production at an 8-hour working day, or double shifts, as what occurred during World War II?

Griliches additionally discusses the fundamental problems associated with gauging R&D effects on productivity. For one, with the lion's share of R&D conducted by the military, measured by "costs," do not become translated into productivity growth, unless they spill over into other industries. Griliches offers a second example of public expenditures on the health-care sector: "A reduction in morbidity would, to a first approximation, raise both GNP and hours worked, leaving output per man-hour largely unchanged."[474] This example is interesting, because it reveals what "productivity measures" may obscure – an investment that improves the quality of life for a percentage of the population, for example. Griliches also comments on the difficulty of interpreting "social gain" from R&D efforts that lead to the development of new or improved products: "The fraction of the direct social gain from such improvements that will show up in the national accounts as they are currently constructed depends on the ability of producers to appropriate the benefits of such innovations and on the treatment of new commodities in the official price index."[475] In this case, according to the author, price would reflect the full social benefit only in the case of monopolistic producers. The author concludes that R&D benefits to the economy are largely underestimated.

But the real reason for the productivity slowdown, according to Griliches, is simply the rise in oil prices during the 1970s. This world event, he reasons, precipitated a series of policy moves that effectively pushed productivity statistics down: "It is not just that many industries had to face new prices, change the way they used their factors of production, and scrap much of their now unprofitable capacity, but also a long worldwide recession induced by the fall in real wealth caused by OPEC, by the fall in aggregate demand caused by the governments trying to control the resulting inflation, and the subsequent fall in U.S. exports

[473] Ibid., p. 17. It could be argued that lower utilization implies the release of less productive factors of production; but such would assume freely adjusting markets and more.
[474] Ibid., p. 18
[475] Ibid., p. 18

and the increase in import competition in the early 1980s as the result of rising dollar exchange rates."[476] The sentence is extraordinary, for it illustrates how far removed the *meaning* we commonly attribute to "productivity" can be from what it is we are purportedly measuring. In this one sentence, productivity is essentially conflated with aggregate demand – demand for products. The explanation for the slowdown suggests a shift in the discourse, with process and worker having quietly left the stage. Products are now center stage – hedonic regression analysis helps keep them there.

At this time, the increasing focus on R&D and disembodied technology – the elusive "black box" of production processes and imputed source of progress – motivated economists and statisticians to reconsider (and argue about) the way in which total factor productivity was measured. Total factor productivity was assumed to move forward in large part because of the (disembodied) technology "residual," or advancement that led to higher output, at given capital/labor ratios. In a celebrated article, Jorgenson[477] and Griliches[478] attempt to solve the puzzle as to why scholars had until then simply assumed that growth statistics were marred by measurement error but failed to provide a theory for how change in real output and input occurs. The hypothesis put forward is: "… if real product and real factor input are accurately accounted for, the observed growth in total factor productivity is negligible."[479] Nowhere in the literature is this relationship so boldly stated. The implications of the claim are wide-ranging, for it essentially states that something cannot come from nothing, that is, that more cannot easily be had with less – the ultimate premise of the productivity discourse and its attraction for political elites, as a policy mover, in both the United States and in France.

Jorgenson and Griliches hypothesize that measurement errors, and in particular, errors of aggregation, can account for the vast portion of growth observed in total factor productivity between 1945 and 1965. These errors, in turn, are traced to "…conceptual errors in the separation of the value of transactions into price

[476] Ibid., p. 19
[477] Dale W. Jorgenson (1933 –) is widely credited for his work in statistics and has been a professor of economics at Harvard University since 1969.
[478] D. W. Jorgenson and Z. Griliches (July 1967), "The explanation of productivity change," *The Review of Economic Studies,* 34:3, pp. 249-283.
[479] Ibid.,, p. 249

and quantity."[480] Interestingly, the authors adopt Abramovitz' [481] notion of total factor productivity change, which essentially suggests that productivity growth – "true" productivity growth – is costless, being derived from new organizational ideas or applied technology – such is a slight variation on the term "neutral technological change," used by R.M. Solow. "True" productivity advances, thus, would represent a shift outward of the production function, rather than a movement along the curve, with the latter representing a shift in resource use. To parse the data and recalculate the total factor productivity growth, Jorgenson and Griliches make the simplifying assumption of constant returns to scale and limit their analysis to a market valuation for all price and quantity data – that is, productivity figures reflect the private sector, only.[482] The analysis is begun with the following identity:[483]

$$q_1Y_1 + q_2Y_2 + \ldots + q_mY_m = p_1X_1 + p_2X_2 + \ldots + p_nX_n$$

Here: Y_i = quantity of the *i*th output; X_j = quantity of the *j*th input; q_i = price of the *i*th output; and p_j = price of the *j*th input. The authors derive total factor productivity growth by differentiating both sides with respect to time and attributing weights[484] reflecting relative values for each input factor (v_j) and output good (w_i):[485]

$$\Sigma w_i\left[\frac{\dot{q}_i}{q_i}+\frac{\dot{Y}_i}{Y_i}\right]=\Sigma v_j\left[\frac{\dot{p}_j}{p_j}+\frac{\dot{X}_j}{X_j}\right]$$

[480] Ibid., p. 250
[481] Moses Abramovitz (1912 –) helped found the economics department at Stanford University in 1948. His work on productivity has been influential throughout the 20th century.
[482] Producer equilibrium is achieved when input/output rates of marginal transformation equal corresponding price ratios, Ibid., p. 253
[483] Ibid., see pp. 251-260 for the theory behind their indices.
[484] The authors adopt Divisia indices, which help to eliminate weight-based errors, as they are "chain-linked," with weights being changed on a continuous basis (theoretically). These indices are discussed in Dale W. Jorgenson and Zvi Griliches, "Notes and book reviews: Divisia index numbers and productivity measurement," available at: http://www.roiw.org/1971/227.pdf (the article is out of print).
[485] The authors use Newton's differentiation notation.

This formulation is important because it ensures that total factor productivity growth can be calculated either from indices of total output minus total input, or from output prices minus input prices – the measures are equal (and come from the assumptions of competitive equilibrium).[486] A shift in the production function, the "costless" advance in productivity, is indicated by a varying index.[487] It is important to bear in mind that the exercise, thus far, concerns measurement of the shift. What causes the shift has not been fully answered.

In order to track measurement errors in standard series of total factor productivity growth, the authors propose a standard way to gauge labor output and input: the quantity of labor involved for each product/service, weighted by its relative valuation in total output/total labor services. The measurement of capital output and input, however, is less straightforward, "… because the consumer of a capital service is usually also the supplier of the service; the whole transaction is recorded only in the internal accounts of individual economic units."[488] The authors argue for a few simplifying assumptions, such as calculating the implicit rental value of a capital services price of service by quantity of service purchased, and the investment replacement rate as declining exponentially over time.[489] The authors point out that the aggregation of capital stock with capital services counts as a common conceptual error in the measurement of total factor productivity. [490] A second problem, with potentially greater implications for measurement error, is that fact that price and quantity have to be separated from total value figures. An error from making an inaccurate separation feeds into errors of price and quantity of investment goods, then for capital services, as well, and finally into total factor productivity figures.[491] Finally, the authors assert that the aggregation of commodity groups, whether inputs or outputs, leads to another major source of error. Once the quantity of commodity products are aggregated into a group, rates of price and quantity growth are

[486] Jorgenson and Griliches (July 1967), pp. 251-253
[487] "… if price ratios are identified with marginal rates of transformation of a production function with constant returns to scale, the index will remain constant if the shift in the production function is zero." Ibid., p. 253 (This is due to the identity as explained: " … total factor productivity may be identified with shifts in the factor price frontier." Ibid., p. 253).
[488] Ibid., pp. 254-255. There is also, according to the authors, the whole problem of accounting for investment good replacement, among other accounting difficulties.
[489] Ibid., 255
[490] Capital stock is measured in terms of machines, and capital service, in terms of machine hours. Ibid., p. 255-257. The authors believe that many prominent statisticians, including John Kendrick, fail to make the separation.
[491] Ibid., pp. 257-258

calculated into Divisia indices, with the assumption that these rates are identical for each commodity group – any divergence is considered to be a change in quality. Although conceded to be nearly impossible in terms of the difficulty of discriminating among the distinct entities (distinct by quality), Jorgenson and Griliches claim that only Divisia indices for each individual item can eliminate the bias.[492] While the arithmetic is clear – the differing rates of growth will bias the index when separate qualities are included in the same index – the implicit meaning in this analysis is subtle: rates of growth change may occur for many reasons, including an alteration in taste, or the discontinuation of a particular product. Quality, here, becomes the default explanation for why consumers change their purchasing patterns – whether or not accurately reflected in the statistical accounts.

Key to this analysis is the claim that statisticians can mitigate errors of aggregation by adopting hedonic price indices. These indices can account for "real" quality change, provided all commodities within the group move in proportion (i.e., have the same marginal rate of transformation) to commodities outside the group (meaning, implicitly, that all commodities in the group exhibit the same quality). Hedonic price indices adjust for quality, in real terms, according to Jorgenson and Griliches and help to more accurately account for distinct inputs and outputs. Typically, however, "quality" becomes known as the "residual," or the factor that helps explain changes in total factor productivity; if delegated in this way, it is definitional – an argument advanced by R.M. Solow.[493] Griliches and Jorgenson instead propose that the use of hedonic price indices establish empirical evidence for quality changes, in which case the adjustment is not purely definitional. The quality of capital goods, for example, could be measured by marginal productivity of capital; such provides a *direct* measure of "capital vintage," which can then be used to construct different quality groups.[494] Importantly, both output *and* inputs are subjected to quality adjustments. This alters the math in an important way.

[492] Ibid., p. 259.
[493] The authors refer to R. M. Solow (August 1957), "Technical change and the aggregate production function," *The Review of Economics and Statistics,* 39:3, pp. 312-320.
[494] Jorgenson and Griliches (1967), pp. 259-260.

By eliminating the aforementioned errors of aggregation, as well as a host of other adjustments,[495] Jorgenson and Griliches gradually attribute an increasing portion of output growth to the rate of input growth. Through this process, the authors are essentially making a case for the idea that something cannot come from nothing. Where total factor productivity growth from 1945 to 1965 was originally gauged to have climbed from .891 to 1.224, with the deductions allotted through re-calculation, the growth range reduces to 1.090 to 1.112, or a near 100% reduction in total factor productivity growth.[496]

Whether or not the calculations represent "reality," the implications of the arguments presented are far-ranging. At a minimal level, the discussion reveals true breaks among the ideas of those most closely involved with the statistical theory of productivity. In this one article, an implicit debate is being carried out between Jorgenson and Griliches and their peers, such as Robert M. Solow, John Kendrick, and Moses Abramovitz, among others. Many of the discrepancies in their work trace not to mathematical manipulations, but to the way in which productivity is conceptualized. For example, Jorgenson and Griliches conclude their article by declaring, "Our conclusion is not that advances in knowledge are negligible, but that the accumulation of knowledge is governed by the same economic laws as any other process of capital accumulation. Costs must be incurred if benefits are to be achieved."[497] While the authors meticulously account for the missing costs, their results rely on a set of assumptions, from production functions with constant returns to scale to pricing models based on hedonic regressions, and changes in consumer preferences that are a function of quality that may or may not obtain in the real world. And, even if these assumptions provide the approximate basis on which to build theories, like all theories, the likelihood that data would be available to accurately test these theories, or at least provide the basis of such detailed disaggregated productivity statistics, for a rapidly changing and complex economy seems a remote possibility.

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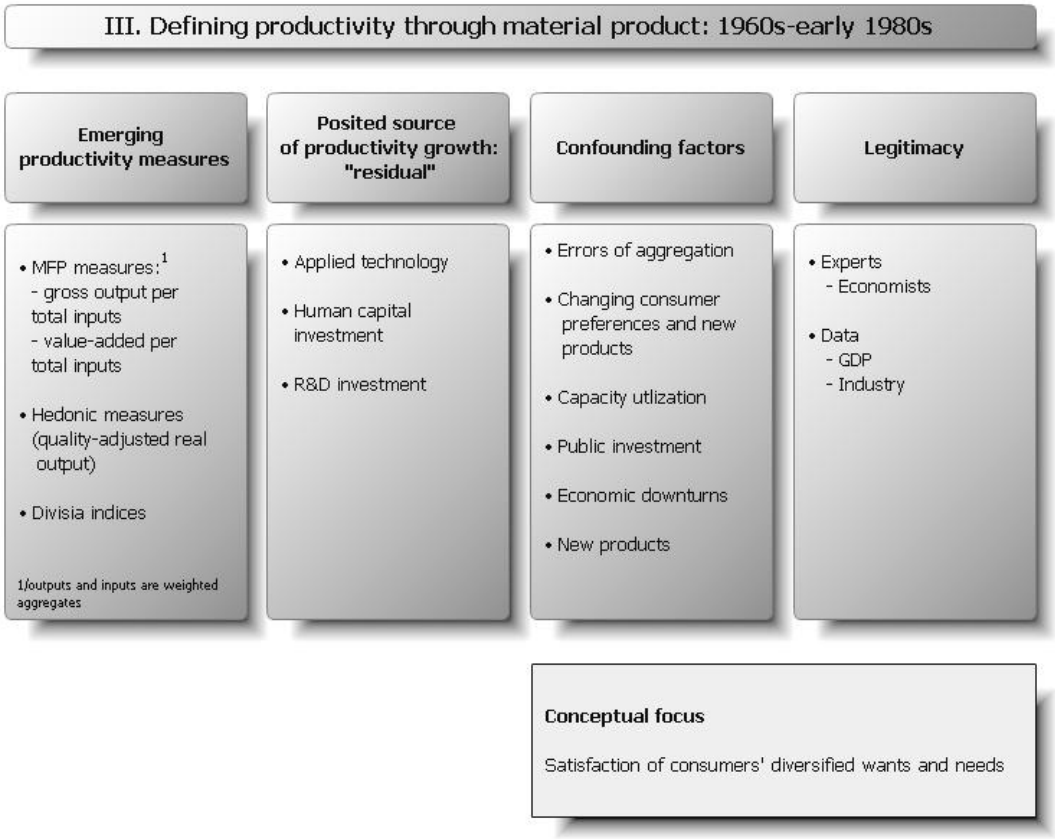
[495] The authors, for example, devise a more "direct" way to measure relative utilization of production factors. Ibid. pp. 264-265.
[496] Ibid., see page 261 for the table of original estimates and p. 271 for the recalculated estimates. In a later review article, Griliches accepts the criticism leveled by Edward F. Denison that the capital measurements suffered from major errors, effectively downsizing their explanation of productivity growth from 94% to 43%. In this article, however, Griliches maintains the importance of trying to "explain" productivity change, not merely account for measurement errors. See Griliches in Berndt and Triplett (1990), p. 193.
[497] Ibid., p. 274. The authors further assume that social and private rates of return on investments leading to "knowledge" are comparable to rates documented for other investments.

According to Solow's calculation, technological change accounted for roughly 87.5 percent of the doubled output per man-hour between 1909-49; the remaining 12.5 percent is attributed to higher capital use.[498] The difference in the way shifts in the production function are measured[499] is noteworthy, but of less importance than the way in which "technological change" is interpreted as a mover of growth. It calls into question the entire relationship between productivity and growth and exposes the ways in which we typically conflate the two: if we cannot know exactly what the residual includes and in what proportion, it is difficult to know the extent to which productivity growth translates into economic growth, overall. The way in which the two are conflated became more obvious with debates surrounding the "computer paradox," a term inspired by Solow's famous quip: "You can see the computer age everywhere but in the productivity statistics."[500] Below, the main elements of the discourse during the years of prosperity are detailed (figure 4.3)

Figure 4.3

[498] Solow (1957), p. 320
[499] Though Solow's article became the reference work for subsequent research on productivity and growth, it did not escape criticism. Some of his assumptions were called into question. According to Robert E. Hall from the Economics Department at Stanford University, "Under the assumptions, productivity growth should be uncorrelated with exogenous variables that induce changes in output but do not shift the production function. In fact, productivity growth is highly correlated with oil prices, quite correlated with military spending, and somewhat correlated with the political party of the President. " Robert E. Hall (July 1989), "Invariance properties of Solow's productivity residual," NBER Working Paper Series, Working Paper No. 3034, Cambridge, MA: NBER. Hall believes that monopolistic competition and consequent increasing returns to scale amounts to the most egregious challenge to the model assumptions, along with the idea that work should be measured not in terms of hours, but "effort": "People work harder when there is more work to do." P. 59
[500] The quote appears in the *New York Times Book Review* article, "We'd Better Watch out," July 12, 1987, p. 36.



4. Linking productivity to intellectual product

The productivity paradox: the IT revolution and an era of slow productivity growth. The computer paradox largely refers to the fact that productivity in the United States began to slow after 1973. Although the effects of energy price increases had been linked to the slowdown in earlier scientific papers, the continued slowdown in the face of a virtual IT revolution appeared puzzling, particularly given relatively high productivity growth from the 1950s until the mid-1970s. For every professional, who had made the transition from typing their work on a word processor to writing, revising and shaping their work on a personal computer, the link between productivity and technology appeared to be patently clear. Economists begged to differ.

It is only in dissecting the real "economic" meaning of "technical change," and how it links to productivity that the paradox can be solved – that is, solved in terms of how the concept is interpreted. Jorgenson made

several attempts to analyze and account for the apparent paradox using Solow's reference article on technical change and its relation to the aggregate production function. In an article written together with Kevin Stiroh,[501] the claim is cleanly stated in the opening sentence: "The rapid diffusion of information technology (IT) is a direct consequence of the swift decline in the price of computer-related equipment, which has led to a vast and continuing substitution of IT equipment for other forms of capital and labor."[502] Essentially, Jorgenson and Stiroh argue that market price motivates substitution away from other forms of capital and labor to produce output, towards greater use of computers. Substitution, as the neo-classical model suggests, represents a movement along the production function, not a shift in the function, which is what Solow defined to be "neutral technical change,"[503] or what Griliches defined to be "costless technology." In these instances, advancement from whatever source, translates into "spillover effects," or effects that benefit individuals beyond those capturing the returns either as producers or consumers.[504] Spillovers, for all intents and purposes, represent the conventional meaning of productivity, "more output per given input." Spillovers, or shifts in the production function, embody the productivity miracle: more for everyone without sacrifice for any one. Without spillovers, the politics of productivity fall silent.

Jorgenson and Stiroh explain the lack of spillovers from the IT revolution by accounting for the technology as a production input, as well as a consumer product. Curiously, an earlier article by Griliches and Jorgenson,[505] presumed TFP growth was downsized after inputs had been properly disaggregated: most of the growth indicated in statistics had been traced to increasing levels of inputs, not increased output per contribution of input. In other words, the declining price induced substitution, at least according to neo-classical economic theory that posits factor price ratios equal marginal rates of substitution for production efficiency – the same is true regarding consumer utility.[506]

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[501]Kevin J. Stiroh is an economist with the Federal Reserve Bank of New York
[502] Dale W. Jorgenson and Kevin J. Stiroh (May 1999), "Information technology and growth," *The American Economic Review,* 89:2, p. 109.
[503] The component is also reflected in total factor productivity growth (TFP), which is noted to have declined during the mid-1990s compared to the time period, 1973-1990, when it was already low, at .34 percent. Ibid., p. 110
[504] Ibid., p. 110
[505] Jorgenson and Griliches (July 1967).
[506] These are standard assumptions in neo-classical theory and are iterated on p. 112 of Jorgenson and Stroh (May 1999).

Jorgenson articulates similar ideas in an earlier speech,[507] where he makes the misconnection between technology and productivity patently clear. Jorgenson divides investment in capital into three parts: tangible capital, human capital and intellectual capital – all of which, he asserts, account for economic growth.[508] Technology embodies all three forms of capital investment. Capital investment – and particularly human capital, according to Jorgenson – causes growth. In the case of intellectual capital, property rights ensure that the benefits accrue to the private investor (this will show up in growth figures). This is the main reason for why we do not see spillover effects from such investments and why growth of spectacular portions does not become reflected in productivity statistics. (And this may be related to Griliches' argument insofar as he accounts for capital inputs in a way that diminishes, again, the spillover effects, otherwise known as total factor productivity gains.)

Computers, like other tangible assets, were incorporated into the national accounts in the late 1980s, with, according to Jorgenson, only Canada following suit (i.e., not other OECD countries).[509] The economist calculates that computers accounted for roughly 6.5 percent of GDP growth from 1973-1995, or a couple of percentage points higher than what he calculates for their growth as inputs – hence a "wash" as far as productivity figures go.[510]

The implications of this argument are quite far-reaching in terms of how we attach meaning to productivity. Intellectual investment and the knowledge thusly derived are largely reflected in the wealth of individuals, which in turn generates growth in the economy. Under this conception, it is hard to find a role for productivity at all, apart from a near-contingent outcome, dependent on spillovers that beneficiaries have not paid for. An idea that cannot be patented, such as industry organization, would arguably cause a shift in the production function. In a sense, Henry Ford was more productive for the US economy than the IT revolution, if these arguments are accepted. Spillovers, in a strict neo-classical sense, could nearly be

[507] Dale Jorgenson (April 12, 1997), "Computers and productivity," *Conference on Service Sector Productivity and the Productivity Paradox*, Centre for the Study of Living Standards, Ottawa, Canada, April 11-12, 1997.
[508] Ibid., p. 4 of speech transcript.
[509] Ibid., p. 10
[510] Ibid., pp. 12-13

thought of as that which eludes the market. Economists have made the case that, as our knowledge of markets becomes more sophisticated – that is, if we could identify returns, unintended spillovers could be translated into property rights.[511]

If the IT Revolution is correctly analyzed to have produced wealth and not necessarily a more productive economy,[512] the discourse on productivity is, for all intents and purposes, on its way to fizzling, or at least to becoming challenged. We may have attached meaning to the word, "productivity," because we have long used the word to indicate good effect for hard effort, at no social cost. But with protected intellectual property rights seen as a key generator of wealth, and a "good" that is hard to incorporate into productivity statistics, the statistics begin to look "wanting." In other words, the concept of productivity remains influential as rhetoric and a mover of policy, but has little to do with how real decisions in the economy are made on the part of private economic actors.

A concrete example may help illustrate this point: If we work harder to cook faster and tell ourselves we have been "productive," it is not really the case, because we have exerted more effort for the better outcome – it is a wash, as claimed by Jorgenson for computers.[513] If we use a Cuisinart, instead of dicing the vegetables by hand, it is because the price provides an incentive to substitute the machinery for manual labor, not because it makes us more productive. Finding a way to use the same pan, as opposed to two different pans, when cooking a complicated meal by first mentally reordering the cooking steps would count as having achieved "productivity," or "costless technology." The fact that we found this tip on the Internet may represent a small technology spillover, but the technology embodied in Google, which led us to the *Test Kitchen* site has been paid for and gains accrued by Larry Page and Sergey Brin, the founders of Google.com. The technology has generated jobs and further wealth for the economy. How the wealth is

[511] Ibid., p. 8. The author attributes this idea to Paul Krugman.
[512] This point is disputed among scholars. The fact that references were still being made to the paradox in articles published after 2000 lends credibility to the claim that the conclusions remain contentious, even in the face of rising productivity statistics during the mid-1990s.
[513] To take the argument further: working more quickly may produce "more time," to produce more or to "purchase" leisure." But, then, a calculation would have to be made to set the cost of working hard and consuming energy to the outcome of, for example, greater free time.

distributed is determined by how the economy is organized – it does not necessarily translate into benefits for all. Is this the correct way to frame productivity? It is at least one way.

Contestation. Querying the assumptions accompanying productivity models has long taken place alongside the lead scientific debate. In the mid-1980s, for example, economist Paul Adler[514] argued that the productivity paradox is more closely linked to economic theory than to faulty statistical measures. In a review article written during the early 1980s, Adler is quick to dismiss hypotheses provided by leading statisticians and economists regarding the paradox.[515] He questions, for example, whether the decomposition of total factor productivity can really be attributed to movements along the production function – attributing any residual to shifts by "technical change" – during periods of huge economic transformations such as those occurring during the last century.[516] Adler attacks the "circular reasoning" of neoclassical theory, where perfect substitutability is assumed, to then argue that when it occurs, the outcome – in this case a decline in productivity during a "computer age" – holds true. Does pay reflect true labor productivity differences? Such questions have been asked and commented on by economists across time, but for lack of additional models, the statisticians move on, repeating (with some reserve) the assumptions that will explain the results obtained. Adler also questions the extent to which the growing service sector can account for the productivity sector: has output in this sector been underestimated? He reasons the computerization of the financial sector and other service sectors would tend to refute the notion that the service sector is a drag on the economy in terms of productivity. Adler uses the example of the manufacturing sector to reason that the slowdown is apparent in this sector as well, which is significant because measurement errors are considered to be less prevalent in this sector compared with other sectors in the economy.[517]

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[514] Paul S. Adler is an economist, who has worked with the French Ministry of Labor, and has been a guest scholar with the Brookings Institution and the US Bureau of Labor Statistics. He has been affiliated with Columbia University and Harvard Business School and is currently the Chair in Business Policy at the Marshall School of Business, University of Southern California.
[515] Paul Adler (October 1982), "The productivity puzzle: numbers alone won't solve it," *Monthly Labor Review,* 105:15, pp. 15-21
[516] This does remind of Solow's own reservations about applying the aggregate production function to his model (Solow, 1957), as well as Griliches cautionary note about the use of hedonic pricing being limited by it main relevance for incremental changes (Adelman and Griliches, 1961). See Adler (1982) for a list of full discussion of grievances.
[517] Ibid., p. 17

Adler makes an interesting comment when he alleges: "The link between productivity and management is difficult to establish because product change and marketing flexibility are often more direct determinants of commercial survival and success than the technical efficiency with which a firm produces a hypothetically stable product."[518] In a sense, Adler is probably agreeing with Griliches that the role of productivity in terms of growth or economic performance is seemingly not as important as we once thought, or is at least not as straightforward as has been assumed. It is curious, however, that Adler chooses to look for the holes in the theory, as distinct from holes in the numbers. Success can also be thought of in terms of economic performance, and economic performance is here linked to "product change," or another good that can be marketed in an effective way.

The productivity puzzle continued: do parametric estimations and hedonic indices provide the solution? It is no small irony that the technological invention bringing us closest to meeting one of the most unrealistic assumptions grounding neoclassical economics – seamlessly available perfect information – should, at the same time, have created such a crisis in the field. Dissatisfied by explanations of increasing of IT inputs increasing almost as fast as IT outputs, errors of aggregation arguments, or poor data by which to measure capital returns, scholars continued in the 1990s to parse the role IT was playing in modern economies. It had to be *somewhere*, if not apparent in the productivity numbers.

In fact, productivity statistics did improve during the later half of the 1990s, and technological advances have been assigned some role in the shift. However, given the magnitude of changes brought about by the IT revolution, scholarly conclusions such as " …the recent increase in productivity growth does appear to rise from an increase in technological change,"[519] seems tentative and diminutive, at best. It is, then, not surprising that during the 1990s, statisticians and economists invested enormous time in trying to estimate hedonic price indices for computers – perhaps still in an attempt to explain the productivity puzzle (but at

[518] Ibid., p. 19
[519] Susanto Basu, John G. Fernald, Matthew D. Shapiro (July 2001), "Productivity growth in the 1990s: technology, utilization, or adjustment?" *NBER Working Paper No. 8359*, Cambridge, MA: NBER

an industry level, note). In a mid-1990s NBER paper by Ernst Berndt, Zvi Griliches and Neal Rappaport,[520] finer parametric specifications are proposed as a way of downwardly adjusting the quality-adjusted price index further still.

In particular, this paper is exclusively dedicated to the measurement of quality changes in personal computers, as reflected in market price. The authors claim that average prices for personal computers declined approximately 11% from 1989-1992, with a precipitously steep drop in prices occurring in 1992. When regressions are run to estimate coefficients for particular qualities (e.g., size, weight, brand, speed, memory and more),[521] which are then used to calculate quality-adjusted weighted price indices,[522] the price decline is calculated at roughly 30%. As noted in previous sections, deflating output value by the newly adjusted index would have the effect of increasing output per input invested; productivity statistics rise. But productivity in this case still represents a movement along the production function – the quality differentials are interpreted to reflect embodied technological change, or whatever alters the quality and content of the factors of production: what is "embodied" is negotiated through the market and consumers/investors increase their consumption of personal computers relative to other goods and services, as relative prices shift. The link to productivity growth is ambiguous.

The authors acknowledge many difficulties with the models tested. For one, the price data used are list prices, which can vary greatly from the actual price paid.[523] Moreover, some of the variables measured can be interpreted ambiguously. The authors ask: is the effect of age on price expected to be close to zero, as older models "obsolesce" at the same rate (why would they?), or does price on vintage models reflect a staying power of some of the older models, in which case price and age would be expected to correlate

[520] Ernst R. Berndt, Zvi Griliches and Neal Rappaport (November 1993), "Econometric estimates of prices indexes for personal computers in the 1990s," *NBER Working Paper, no. 4549,* Cambridge, MA: NBER
[521] The authors point out that government statistical agencies commonly use "matched model" indices, where products with like qualities, such as speed, memory, storage capacity, are compared in price indices, not those that change over time. Ibid., pp. 2-3.
[522] Different indices, such as Laspeyres, Paasche and Divisia, are tested, along with different modeling techniques to test the robustness of the reported results.
[523] Ibid., pp. 4-5.

positively?[524] The question can be answered empirically, of course, but without a theory about what we would expect to observe, the results are difficult to incorporate into a theory of its relation to productivity. If price suddenly drops in 1992, with the drop being reflected in both the simple arithmetic mean price, as well as the quality-adjusted price, what does this imply? If studying hedonic price indices, the drop could be interpreted to reflect huge technological progress – a break in one year. If the simple arithmetic mean price were studied, non-quality adjusted, then the drop in price might just as well reflect a lowering of demand, as what might occur during recessionary times.

Griliches, who in his earlier paper written with Jorgenson on productivity change[525] lamented that we lacked a theory about how productivity is generated, had become an advocate for parametric[526] estimations of productivity. Econometrics, he claimed, "…allows one to test or validate a particular way of measuring an input or adjusting it for quality changes; to estimate and test the role of left-out public good inputs such as R&D and other externality generating activities; to estimate economies of scale; and to check on the possibilities of disequilibria and the deviation of "true" output elasticities from their respective factor shares."[527] But, as Griliches thereafter concedes, econometric approaches are susceptible to errors of aggregation just as indices are, not to mention a host of other issues that commonly afflict regression analysis (simultaneity, or the direction of causation, being one of them). Interestingly, Griliches defends a common charge against hedonic indexes that they require subjective valuations, arguing, "They require more data and … they expose some of these judgments to the final user of the results, providing an implicit warning of their tenuousness." [528] In other words, he further argues, the parametric approach makes assumptions clear and apparent, whereas indices simply hide them.

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[524] Ibid., p. 9
[525] Griliches and Jorgenson (1967)
[526] Parametric regression analysis is one that posits a known (proposed) functional form
[527] Griliches Zvi, "Hedonic price Indexes and the measurement of capital and productivity: some historical reflections," in Ernst R. Berndt and Jack E. Triplett, eds. (1990), *Fifty Years of Economic Measurement: the jubilee of the conference on research in income and wealth* (Studies in Income and Wealth, volume 54, NBER), Chicago: University of Chicago Press., p. 197.
[528] Ibid., p. 191

Griliches had long argued that hedonic regression could not solve the problems intrinsic to price indices, such as how to trace price differentials to supply or demand or how to interpret welfare implications of the indices – hedonic regression supplies "missing prices" related to quality change, only.[529] "Missing prices" could apply to factor inputs, as well: hedonic price indices thusly present a way to identify the "embodied" technological change wrongly attributed to the "residual." But even were hedonic models able to accurately extract the misappropriated part of productivity growth attributed to the "residual," or "technology," issues remain. Capacity utilization, and the difficulty of markets to clear when sudden shifts in demand or other exogenous changes alter the way in which (particularly) capital is employed, often gets wrongly attributed to "technology," or whatever it is that *causes* productivity that we cannot explain – again, this is Griliches' chief complaint. And this idea is evident in his statement that, "The U.S. economy did not 'forget' 4% of its technology between 1974 and 1975."[530]

But, even if we were to accept the argument that short-run fluctuations in demand and/or supply can result in misleading productivity statistics, and therefore the focus on growth needs to be over the long-run, Griliches continues to insist that parametric approaches will provide the way to *get at* the elusive cause of productivity, unlike statistical measures, which can do no more than tabulate inputs, often from crudely aggregated elements. As an example, he explains, "…capital growth accelerated in the 1970s in many industries without a comparable increase in the growth of output. In the index-number sense of growth accounting, capital 'explained' a larger fraction of the growth of output, and we did, indeed, have a smaller residual."[531]

As indicted earlier, Griliches argues that econometric models provide a way to measure the production function and attempt to discern the role played by elements that are not captured in productivity statistics, such as public R&D. The idea does not go unchallenged. Robert E. Lipsey,[532] in a comment to this review

[529] Ibid., p. 189. This discussion cites an earlier 1976 work by Griliches and Ohta.
[530] Ibid., p. 195
[531] Ibid., p. 197
[532] Robert E. Lipsey was Professor Emeritus at the Graduate Center and Queens College, CUNY, Program in Economics. He had long been affiliated with NBER and headed the New York office. Ibid., p. 204. Professor Lipsey passed away in 2011.

article, questions the wisdom of using the production function to gauge productivity growth: "At the necessary level of aggregation, they are *fictions*[533] far removed from what I would think of as genuine production functions for very specific products or processes."[534] He further questions the privileging of direct inputs over indirect inputs, and the way in which the production function bypasses all economic activity that falls outside its scope. When Lipsey remarks that productivity would increase simply by increasing wages and taxing capital as a way of eliminating poorer performing factors of production, he speaks to the idea that what we *mean* by productivity is relative to what we include in that measure and how we measure it; it also means well-being, or the proxy values that is often conflated with productivity measures, may well only selectively describe the economy. The wording in the quote is interesting, in that he is challenging the relevance of the aggregate production function for "specific products or processes."

Lipsey is not the first economist to query the absolute usefulness of the aggregate production function for the purposes of tracking productivity growth. Griliches and Jorgenson first exposed errors in productivity growth statistics stemming from faulty aggregation methods in their seminal 1967 article and Solow presents his reservation about using the aggregate production function at the beginning of his famous article from 1957. Do these remarks invalidate the intellectual exercise of trying to fit a complex and rapidly changing economy onto a mathematical line? Clearly not – the merit of conceptualizing an aggregate production function from a heuristic point of view is given: we thereby begin to order our thoughts and think about how economies function. Economists know the assumptions they make when abstracting functions to help them conceptualize an entity as complex as an economy. But, once the figures are derived, policymakers appropriate them – the assumptions become lost in translation; the numbers then become reified and spontaneously take on the meanings lent to them.

It is curious that in a recent OECD manual on measuring productivity, the authors are at pains to underscore that "… accounting is not explaining the underlying causes of growth."[535] This is exactly the

[533] Italics added.
[534] Ibid., p. 204
[535] OECD (2001), p. 121.

point that Griliches made, together with Jorgenson, in 1967, and a point that Griliches continued to deliver over time. The OECD authors cite an interesting quote by Griliches: [536]

> We can take productivity growth calculation and allocate it in great detail to the various missed components, reducing thereby the role of the "unallocated" residual. But this, while very instructive and valuable, only shifts the problem to a new set of questions: why was there all this investment in human capital? Will it continue? Where did the improvements in capital equipment come from? […] Real explanations will come from identifying the incentives and sources of scientific and technological advances and from identifying the incentives and circumstances that brought them about and that facilitated their implementation and diffusion. Explanation must come from comprehending the *historical* detail.

And so, possibly the most influential thinker in the field of productivity measurement makes a concession to history and circumstance – something that neo-classical economists are not only loathe to do, but essentially *cannot* do, given the assumptions of long-run equilibrium theory. And Griliches did not come upon this notion immediately during his illustrious career, but came to this conclusion after long attempting to understand how productivity should be measured and what the measurement *meant.* Griliches first identifies errors of aggregation as sources of confusion in the debate on productivity measures, and later appeals to econometric models as a way of pinpointing causation (or: linkages). Finally, two years before his death, he implicates the role that circumstance (or: contingency) might play in determining the cause of productivity – the concession provides an opening for *a variation on* neo-classical economic theory because it implies that production outcomes may differ between two historical periods, even were all other relevant factors, such as capital/labor ratios and technology, held constant. By next extension: outcomes can differ, depending on the particular economy under consideration. And the last plausible extension: capitalism comes in varieties, and incentive structures differ.

Does Griliches' comment help legitimize the varieties of capitalism (VoC) literature, whereby we assume that a country's institutional structure confers comparative advantage in certain (kinds of) product markets over others? Not necessarily. But it is interesting to note that the elusive power of bare-bones neo-classical theory to explain productivity growth (or, investment incentives) could have well opened the way for alternative theories of economic organization – or theories that were grounded in historical context. For example, how did the Swedish economy become Swedish? It is doubtful that an institutional framework –

[536] Ibid., p. 121. Emphasis added. The quote comes from, Zvi Griliches (1997), "R&D and the productivity slowdown: Is recovery around the corner?"(unpublished mimeo).

based on consensus and coordination – simply sprang into being from qualities intrinsic to Sweden. Agents – *someone* – developed institutional structures, based either on their interests or ideas – or both. But, whether we attribute the outcome to structure or agent or interplay between the two, the VoC literature claims that economies can be organized in different ways and that globalization will deepen rather than erode the difference.[537] This seemingly obvious idea would not be worthy of a tome were it not for the previously dominating neoclassical framework granting legitimacy only to liberal economies, irrespective of history or culture.

In their edited volume, *Varieties of Capitalism,* Peter A. Hall and David Soskice allow "culture" to influence economic organization in the following way: "Many actors learn to follow a set of informal rules by virtue of experience with a familiar set of actors and the shared understandings that accumulate from this experience constitute something like a common culture."[538] The authors go on to suggest that history influences the institutions that, in turn, define a particular type of economy because "…they are created by actions, statutory or otherwise, that establish formal institutions and their operating procedures [and] […] repeated historical experience builds up a set of common expectations that allows actors to coordinate effectively with each other."[539]

If Griliches went looking for historically contingent causes of *incentive,* this literature would provide at least a hypothesis. What is key to this quasi "break" in the discourse on economic theory is the idea that production functions have to be given a social context. If institutional support structures, for example, are considered critical to the analysis, it then becomes tempting to bring the level of analysis down to the firm to determine in which ways these structures relate to investment decisions,[540] particularly with regard to innovation. Situating outcomes within a particular institutional frame also opens the way to make cross-

[537] According to authors Peter A. Hall and David Soskice, two main "types" of economies are labeled liberal market economies (LMEs) and coordinated market economies (CMEs). The authors claim that, "In *liberal market economies*, firms coordinate their activities primarily via hierarchies and competitive market arrangements." They contrast this type of capitalism with coordinated market economies in which "…firms depend more heavily on non-market relationships to coordinate their endeavors with other actors and to construct their core competencies." Peter A. Hall and David Soskice, eds., (2001), *Varieties of Capitalism,* Oxford: Oxford University Press, p. 8. Italics in text.
[538] Ibid., p. 13
[539] Ibid., p. 13
[540] Hall and Soskice use the term "strategic interactions," as they apply to economic agents. Ibid., p. 5.

country comparisons in order to gauge respective influences on "incentives."[541] Whether or not the VoC literature is defensible as a variation on neoclassical economics is not important. What matters is that this literature may have contributed to (or simply reflects) a shift in the way productivity statistics became viewed in the 1990s, or the meanings attached to them because "economic performance" was now encouraged to be situated in a particular context.[542] Breaking down the level of analysis to firm-level data also influences the way in which we interpret productivity, its implications for the competitiveness of an economy, and the mix of scholars that address the statistical debate.[543]

Viewing the productivity paradox at close range: firm-level analysis and international comparisons. Scholars, of course, had long been analyzing firm-level productivity statistics before the 1990s. But the still contested productivity paradox no doubt intensified the focus at the firm level in an attempt to understand how information systems were affecting organizational decisions and overall company outcomes. Increasingly the province of professors affiliated with business schools, the discourse on productivity seemingly cedes territory to a broader conceptual frame, loosely described as "firm performance." Productivity, as an outcome, is ever-present in the academic press, as are borrowed forms of the Cobb-Douglas production function. But the disjuncture between what is found at the firm level of analysis and what is represented at the aggregate level unavoidably contributes to a fissure in the (old) productivity discourse and opens the way to seed a new discourse based on these broader (more flexible) measures.

Federal reserve economists Stephen D. Oliner and Daniel E. Sichel,[544] for example, use a firm-level analysis to try and solve the "puzzle." The authors consider all possible explanations: the near-exclusive focus on computer hardware, rather than including software and labor input intrinsic to computer services;

[541] In fact, the VoC literature appears to have influenced the development of new parametric measures of productivity that include regulatory and institutional frameworks as independent variables. See, for example, Stephano Scarpetta and Thierry Tressel (2002), "Productivity and convergence in a panel of OECD industries: do regulations and institutions matter?" OECD Economics Department Working Papers, no. 341, Paris: OECD
[542] The quote from Griliches, for example, evidences a doubt about an ahistorical interpretation of incentive structures. In policy debates, technology investment is declared to be in need of new incentive structures. See chapters 9 and 10.
[543] In the most current roster of NBER family members in productivity, roughly half of the scholars are affiliated with business schools; most of the rest are affiliated with economics departments. Whether those affiliated with business schools hold PhDs in economics or a management science is cause for a more detailed study.
[544] Both economists also contribute to NBER publications.

the exclusion of other information processing equipment in the calculation; in appropriate price deflators resulting in biased fixed weights in statistical measures; and even the idea that computers require a learning component, or a length of time to create the organizational changes in an economy that leads to higher productivity. [545]

After making measurement adjustments and attempting to control for some of these purported drags on productivity statistics, the author conclude that computing equipment still only accounted for a small percentage of total growth in the economy, or about .16% annual growth from 1970-92.[546] The authors then take an alternative route for explaining the productivity puzzle by claiming that "computers are not everywhere," when measured as a share of current-dollar income. This observation leads the authors to claim that computers remain a relatively small factor of production when considered in the aggregate – that conclusion allegedly changes by considering firm-level productivity.[547] This is a postulation that gains currency during the 1990s and results in a shift in the discourse on productivity.

To test the implications of their claim, the authors attempt to adjust aggregate growth figures by accounting for firm-level private returns traced to computers, as well as wage premiums earned by workers using computers.[548] The nominal rates of return are high compared to baseline rates, [549] leading the authors to speculate that investment in computers may be sub-optimal. Still, factoring in the superior rates of return does not impressively enhance the contribution of computing equipment to aggregate growth. What is curious about the analysis is not so much that these different adjustments do not seem to grant IT a larger role in the growth of the economy; it is the shift in the discourse to *growth*, per se. Solow's quip refers to

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[545] Stephen D. Oliner, Daniel E. Sichel, Jack E. Triplett, and Robert J. Gordon (1994), "Computers and output growth revisited: how big is the puzzle?" *Brookings Papers on Economic Activity, 1994:2,* Washington DC: The Brookings Institution, pp. 273-334
[546] Ibid., p. 285
[547] Ibid., p. 286. There does not appear to be a consensus among scholars regarding what gets lost in translation in the process of aggregation.
[548] The first claim is made, among others, by Erik Brynjolfsson (December 1993), "The productivity paradox of information technology," *Communications of the ACM*, 36:12, pp. 67-77 and Lorin M. Hitt (1993), "New evidence on the returns to information systems," *Technical Report*, Center for Coordination Science, Sloan School of Management, Cambridge, MA: MIT. The second is made by Alan B. Krueger (1993), "How computers have changed the wage structure: evidence from microdata, 1984-1989," *Quarterly Journal of Economics,* 108:1, pp. 33-60.
[549] This is calculated using a nominal return rate on both net and gross output; it is based from a regression coefficient generated by a model based on the Cobb-Douglas function. Ibid., p. 292

multifactor productivity. If computers produce productivity at a firm level, the question still remains: why do the aggregate figures not reflect this claim? Is it because we cannot account for this that the discourse has shifted to other outcomes?

As the discourse begins to penetrate elite business schools in the US, the strict language of productivity measurement theory dissipates, somewhat. An article by Erik Brynjolfsson and Lorin Hitt illustrates this influential trend in an article that, again, attempts to link spending on what they term "information systems" (IS) and output at the firm level.[550] Their argument: that quality and/or product variety may not be adequately incorporated in the aggregate statistics – gains that are in evidence at the firm level. But this argument betrays the crucial issue that has confounded productivity statistics from the beginning: how valuation is equated with productivity (and the contingency of price deflators to accurately measure output).

In this article, higher productivity from computer use is linked with international competitiveness. Arguably, making this link alters the status of productivity statistics first because international competitiveness can be achieved in different ways that can be influenced by factors unrelated to how a firm may be using a technology such as IS: exchange rates, for one, and differing capital/labor endowments among competing countries, for another; moreover, competitiveness, as a concept, may be more difficult to gauge than raw, quality-adjusted output. Brynjolfsson and Hitt point out that many studies conflate IT spending with performance measures such as profit, which, in theory, should not be higher in computer-intensive industries than other industries, assuming market equilibrium.[551] Recognizing that contemporaneous scholars have failed to uncover significant productivity increases, they argue that their results differ because their data are more detailed and more recent (meaning that it has taken time for firms to make the necessary organizational adjustments to capitalize on computer productivity). The authors use a

[550] Erik Brynjolfsson and Lorin M. Hitt (April 1996), "Paradox lost? Firm-level evidence on the returns to information systems spending, *Management Science,* 42:4, pp. 541-558. E. Brynjolfsson is now Schussel Family Profess at the MIT Sloan School of Management and Director of the MIT Center for Digital Business. L. Hitt is now Professor of Operations and Information Management at the Wharton School.
[551] Ibid., p.542

variant the standard Cobb-Douglas specification, allowing for continuous substitution between factors of production, but separating computer capital from non-computer capital:[552]

$$Q = e^{\beta 0} C^{\beta 1} K^{\beta 2} S^{\beta 3} L^{\beta 4}$$

In this equation, Q output; $e^{\beta 0}$ = multi-factor productivity (or, "technology" depending on how this is framed in the model)[553]; $C^{\beta 1}$ = computer capital; $K^{\beta 2}$= non-computer capital; $S^{\beta 3}$= IS staff labor; $L^{\beta 4}$=other labor and expenses. Taking logarithms of both sides of the equation transforms this to a linear equation, which is estimated using ordinary least squares (OLS). Once in linear form, the regression coefficients can be read as the amount of additional output, per unit of increased input, a standard definition of marginal product (MP) – in this article, MP is equated with rate of return.[554]

Although it is standard to apply variants of this function in the economic literature to diverse production settings, it is not unchallenged.[555] Most critically, the model produces the results whereby the shares of product going to capital and labor are constant – whatever the amount of the inputs used, or their relative prices. Economists have questioned this outcome that essentially falls out from the math, but it is remarkable how scholars continue to base their work on this model, and the justification given by Brynjolfsson and Hitt fits squarely in this pattern: "This specification is probably the most common functional form used for estimating production functions and remains the standard for studies such as ours, which seek to account for output growth by looking at inputs and other factors."[556] But what is the guarantee that the macroeconomic model can translate seamlessly to the microeconomic setting of the firm? And, the fact that the model, in any event, was not based on economic theory, but on its mathematical properties would seem to speak to Adler's criticism, that neo-classical economics involves a kind of

[552] Ibid., p. 545
[553] In this case, the exponent is "1" – only the factors of production sum to "1" under the assumption of constant returns to scale; β^1- β^4 represent output elasticity, or how output change per change in the level of each input.
[554] Ibid., p. 545
[555] For example, the way in which assumptions bias the elasticities of substations is described in Pol Antras (2004) " Is the US aggregate production function Cobb-Douglas? New estimates of the elasticity of substitution," *Contributions to Macroeconomics,* 4:1 (article 4), pp. 1-34, Berkeley, CA: The Berkeley Electronic Press: http://www.bepress.com/bejm
[556] Ibid., p. 545

"circularity" in its reasoning.[557] What does it *mean* for a firm to devote constant shares of its output income to capital and labor? And, is this not contrary to the idea that firms are flexible and free to make adjustments that would render them more competitive? Why would an individual follow a mathematically determined strategy? In some sense, the functional form is easier to pitch for the economy as a whole, reasoning that the law of averages might be at work; for firm-level analysis, the assumption is less convincing.

Brynjolfsson and Hitt report results indicating that computer equipment correlates with higher output levels.[558] The higher returns to computer usage versus non-computer usage should not necessarily translate to greater IS spending, as they suggest theory would dictate (although this study indicates that spending *does* increase). Brynjolfsson and Hitt speculate that firms might, first, need to reorganize before making larger investments, or that they might view IS spending as riskier than other investments (and therefore in need of higher returns before increasing spending) and conclude that IS spending "… is often cited as an enabling technology which does not just produce productivity for individuals, but provides benefits by facilitating business process redesign or improving the ability of groups to work together."[559] All are outcomes that are difficult to capture in statistical measures.

Brynjolfsson and Hitt concede the difficulty of inferring "value" – through changes in firm revenue, noting that more "direct" evidence would be in order.[560] "Value," generally, has always been "inferred" from market outcome, and consumer valuation affects productivity statistics. The fact that, in bringing the analysis to the firm level, they do not manage to escape this inference, in the same way that they do not try to avoid the Cobb-Douglas production function, is interesting to note. The staying power of a function, first tested over a century ago, may have more to do with the assumptions on which it is based than an economy

[557] Adler (1982), p. 17
[558] Brynjolfsson and Hitt (1996), p. 550. Specifically, "…an additional dollar of computer capital stock is associated with an increase in output of 81 cents per year on the margin." Possible data errors and correlation of the error term with "inputs" is considered and accounted for using standard econometric techniques. See discussion pp. 552-555.
[559] Ibid., p. 557
[560] Ibid., p. 557

that supposedly conforms to it, despite the massive transformations undergone in the US economy during the last 100 years.[561]

In a later publication by Brynjolfsson and Hitt, the gap between IT productivity measured at a firm level compared to that calculated in the aggregate is more pointedly explored.[562] And, remarkably, references to the productivity paradox continue to be made – more than a decade following Solow's quotable quote. With this paper, the shift in discourse becomes more sharply focused: productivity measures are sometimes paired with "performance" measures and the ever-elusive residual in productivity measures is linked more closely with organizational changes – ideas – than the investment in IT, per se. With the claim, "As computers become cheaper and more powerful, the business value of computers is limited less by computational capability and more by the ability of managers to invent new processes, procedures and organizational structures that leverage this capability,"[563] business scholars – or, at least economists affiliated with business schools, effectively move onto the debate stage, which suggests that the concept of productivity will be cast in new lights, or studied from different angles. As new voices become legitimized in the newly developing discourse, we would expect novel social meanings to develop for the concept of productivity: business performance.

Brynjolfsson and Hitt hypothesize that IT is more of a "general purpose technology," whose benefits are typically more far ranging than ordinary capital investments because they play a role in facilitating "complementary innovations."[564] The authors organize their arguments around two premises: "…first, that a significant component of the value of information technology is its ability to enable complementary organizational investments such as business processes and work practices; second, these investments … lead to productivity increases by reducing costs and, more importantly, by enabling firms to increase output quality in the form of new products or in improvements in intangible aspects of existing products like

[561] See concluding chapter for Robert M. Solow's comment on the C-D production function.
[562] Erik Brynjolfsson and Lorin M. Hitt (Autumn 2000), "Beyond computation: information technology, organizational transformation and business performance," *The Journal of Economic Perspectives,* 14:4, pp. 23-48.
[563] Ibid., p. 24
[564] Ibid., p. 24

convenience, timeliness, quality and variety." [565] The claim is made that firm-level data provide better measures of intangible investment (such as organizational changes) than aggregated data.

According to Brynjolfsson and Hitt, studies conducted in the 1990s using firm-level data have shown connections between the use of IT and increased productivity, although the direction of causation is not altogether clear: do firms invest in IT and then become more productive or do productive firms spend more of their superior earnings on IT?[566] Or, is the relationship endogenous? If the latter, what does this mean regarding the effect of IT on productivity? The relationship between IT and productivity is further clouded by a myriad of issues, ranging from hidden assets (e.g., changing organizational practices) and the time period over which productivity changes are measures (IT-related business practice innovations tend to produce results over a longer time period than more "direct" effects of IT use, per se). The argument points out problems associated with intangible assets, such as "… the costs of developing new software, populating a database, implementing a new process, acquiring a more highly skilled staff, or undergoing a major organizational transformation, all of which go unaccounted for on a firm's balance sheet."[567] This measurement issue may influence the way in which a firm's *performance* is gauged. Does it influence productivity issues, if these intangible assets are considered inputs?

Much of the analysis centers on the effects of IT investment and organizational change – studies, for example, show that a firm's vertical integration declines as it increases its investment in IT, an outcome expected from the way in which IT can lower transaction costs with suppliers. According to Brynjolfsson and Hitt, decentralization appears to be associated with a higher investment in IT, which contributes to higher productivity rates: "Firms that are in the top half of *both* information technology investment and decentralization are on average 5 percent more productive than firms that are above average only information technology investment or in decentralization."[568] It is not clear from the text how productivity is measured – although earlier studies cited in the text describe productivity in terms of value-added – and

[565] Ibid., p. 24
[566] Ibid., p. 32. This point is clarified in an interview with Erik Brynjolfsson (August 11, 2011). See chapter 12, p. 457.
[567] Ibid., see pages 33-34
[568] Ibid., p. 36

what how other contributing factors are being controlled for is not stated. Brynjolfsson and Hitt do control for other "measured assets" when suggesting that firms in the higher range of decentralization have, on average, a six percent higher market valuation – hence, better business performance.[569] Stock market valuation, however, may be influenced by other factors – such as demand – and again, we confront measures (at the firm and macro levels), for which the source of valuation is difficult to disentangle.

Brynjolfsson and Hitt then propose reasons for why benefits deriving from IT investments at the firm level do not seem to be reflected "macroeconomic performance." In addition to the greater ease with which intangible assets may be measured, they point to "quality-adjusted price declines" as a primary source of IT growth (and other non-measurable aspects, such as "convenience"). And although studies have shown a contribution to growth in the latter part of the 1990s by 1.0-1.1 percent annually, Brynjolfsson and Hitt acknowledge that other studies have demonstrated productivity growth in the "computer producing" sectors, with virtually no productivity change in the "computer-using" sectors.[570] They additionally point out that intangible aspects are typically treated as expenses, rather than capital investments – which underestimate output growth.[571] Finally, growth estimates are reasoned to have not captured the full effect of quality improvements or the introduction of new products, something that is easier to measure at the firm level.[572] All of these elements, according to Brynjolfsson and Hitt require complex calculations, probably already difficult at the firm level, let alone at the macroeconomic level, with an increasing portion of service inputs into the production of many industries, making the exercise, for all intents and purposes,

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[569] Ibid., p. 36. It is curious that the authors use these improvements in productivity and business performance to counter an alternative hypothesis that IT and new organizational practices are spuriously correlated because some managers are disposed towards experimenting and adopting new technologies and novel organizational practice – suggesting that "temperament" is the cause of the correlation, not economic gains, per se. *Homo Economicus* once again defeats agency!

[570] The authors explain why this might be so, with the following example: "If a firm maintains a constant nominal information technology budget in the face of 50 percent information technology price declines over two years, it is treated in the national accounts as using 100 percent more real information technology input for production. A commensurate increase in real output is required merely to maintain the same measured productivity levels as before. Such an output increase is not necessarily automatic since it requires a significant change in the input mix and organization of production." Ibid., p. 38

[571] The caveat being that the downward bias matters only in times of rapid change (meaning it is not consistently biased, from year to year), and the authors claim that the computer-based economy is undergoing transformative changes, making the bias more apparent. Ibid., pp. 40-41

[572] The authors claim that the BLS fails to incorporate new goods into their indices until many years after their market introduction, which then misses the rapid price declines often accompanying the early years of a product cycle. Ibid., p. 42-43

impossible to carry out.[573] What are the implications for the meaning we attach to productivity? It would seem that evidence is building for the claim that the productivity discourse loses steam and that the link to policy is becoming more tenuous over time. If firm-level data outperform aggregate statistics, the focus falls more squarely on individual business enterprises and the role played by managers in terms of generating a healthy, competitive economy.[574]

Brynjolfsson and Hitt conclude their article discussing the ways in which firm-level data may provide inaccurate measures of social gains accrued from quality improvements. Specifically, Brynjolfsson and Hitt point out that firm-level price differentials relating to market power and not "consumer preferences" will distort the effects of IT on productivity statistics.[575] In equilibrium and under conditions of perfect competition, price is assumed to reflect consumer preferences – where producers are willing to supply what consumers demand. In situations of monopolistic competition, producers produce less than what is demanded: the relationship between consumer preferences, price and output is distorted, and the link between price and productivity is severed. But, this argument brings us full circle. What accounts for consumer preferences? In neo-classical models, they are assumed to be given. Adelman and Griliches, in the their seminal work on the development of hedonic price indexes,[576] queries the relationship between advertisement and consumer preferences. If culture, or advertisement, or the consumption patterns of others all work to influence preferences, how might this be captured in the models on which price indexes are based? It is an issue worthwhile to explore, so that even if we were to develop prices indexes in conditions of perfect competition for the IT industry,[577] the issue remains: is "productivity" being properly measured by a given set of consumer preferences? And, if advertisers succeed in altering consumer preferences,

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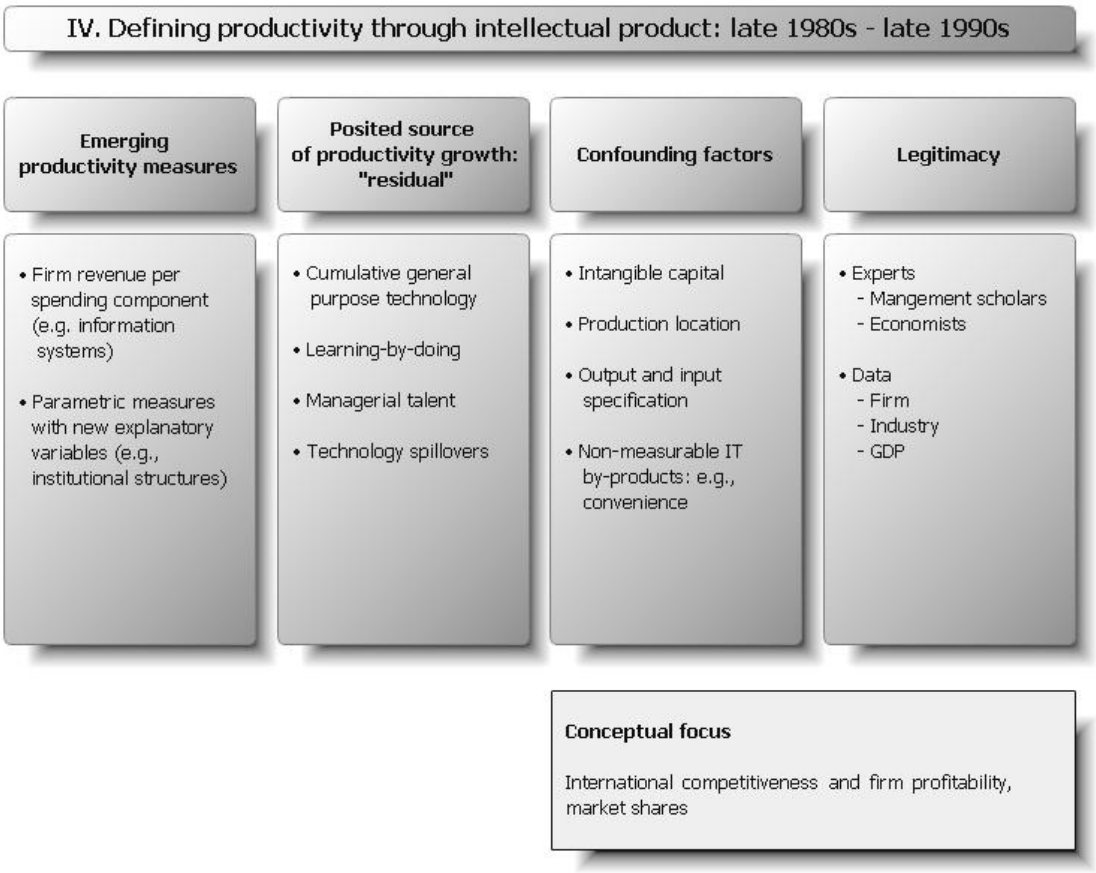
[573] Ibid., p. 44
[574] Interestingly, studies conducted by the Economic Policy Institute in Washington DC show that the ratio of CEO pay to average worker pay in the US rose from 20.3 in 1965 to 28.5 in 1978; the ratio jumps to 56.1 in 1989 and leaps to 115.7 in 1997.[574] The points at which this ratio changes over time, is noteworthy. The shift in productivity discourse to firm-level data beginning in the late 1980s and becoming more dominating during the 1990s curiously matches accelerating remuneration for CEOs. This correlation does not have to relate directly to, or be *caused* by, a "shift in discourse." It cannot, however, be coincidental that shifts in the discourse, and the consequent changes in the way productivity is calculated, tend to be well reflected in the social context. See: http://www.epi.org/publications/entry/webfeatures_snapshots_archive_03311999/
[575] Ibid., p. 44
[576] Adelman and Griliches (1961), p. 548
[577] The market position of Microsoft Corporation rather clearly challenges this assumption.

should the change automatically be reflected in productivity statistics? Does getting what we want after an advertiser alters our perception of a good or service, or a changed social norm modifies the way in which we value a good or a service, make us more productive? At the end of the 20th century, productivity – far removed from Max Weber's interpretation,[578] for which the bare-bones savings rate may nearly have sufficed as a statistical proxy – is now equated with the ability to satisfy our growing wants and needs. Ideas characterizing the 1980s-1990s discourse on productivity are summarized in figure 4.4.

Figure 4.4

[578] "When the limitation of consumption is combined with this release of acquisitive activity, the inevitable practical result is obvious: accumulation of capital through ascetic compulsion to save." Weber (1992), p. 116



Summary: perceiving history through statistical measures of productivity. During the early 1960s, government officials held a conference in Amiens, France to discuss ways in which the productivity of both public and private professionals could be enhanced. In the session focusing on the architecture profession, the speaker voiced his opinion about the meaning of productivity in this field: "We think that the productivity of architects … consists in knowing that he must produce designs that are useful to the society in which he lives."[579] The speaker then goes on to lament the criticism he receives when financial matters are delayed, but that no one voices concern when he designs a building in which people live badly. [580] In other words, what may be considered to be productive in one society could well differ in another. It is not inevitable that productive architecture must be that for which output is maximized, given inputs available.

[579] P. Drouin, head architect for national buildings. France (1962), *La productivité dans les Professions Libérales,* (conference proceedings), Paris: SADEP, p. 10
[580] Ibid., p. 10

For this individual, productivity is a function of whether or not architects are fulfilling their social responsibility.

The raw definition of productivity – output per input invested – stayed relatively constant among US economists and statisticians throughout the 20th century.[581] From this definition, higher productivity meant larger amounts of output or fewer inputs compared to previous time periods. That is, contrary to the vision of at least one dissenting French architect, "more" became and remained the relevant goal and ultimate social value.[582] What shifted over time was the lens through which productivity, particularly the benefit of productivity growth – the surplus – became measured and explained. Largely, the lens shifted in step with changes in the social context, an outcome predicted by theory.[583] These shifts can be described in a broad-brush sense, with the changing construction of productivity statistics and the scholarly debates that accompanied them providing hints about interests and ideas at any one point in time. For example, during the first decades of the century, and under the influence of Taylorism, productivity was filtered through "man." How the raw power of a worker was to be maximized was an empirical question, and it was, for the most part, determined in a static sense: the worker as given. The division of labor enhanced efficiency: more could be produced for the same amount of input: "man." The obsession with hourly output in productivity constructs exposes the static way in which output was to be produced and measured. Conceptually, machines and energy clouded the way in labor productivity could be measured – it was important to delete it as a way of exposing the main creator of more: "man."

Following World War II and with the growing power of Fordism, productivity statistics begin to reflect the mechanization and standardization of products and processes. Mechanization produced the justification for focusing on average wage rates to calculate labor cost – the differentiation of product quality was

[581] The aim of the chapter is to uncover shifts in the discourse. It is sufficient to find these breaks in one country, where the discourse was influential, in order to provide this perspective; hence, the focus on the US.
[582] This thesis is explored in Collins (2000)
[583] The role played by a "concatenation of *casual mechanisms*" and their relationship to specific points in time is discussed in Patrick Thaddeus Jackson, "Making Sense of Making Sense: configurational analysis and the double hermeneutic," in Dvora Yanow and Peregrine Schwartz-Shea, eds. (2006), *Interpretation and Method: empirical research methods and the interpretive turn,* Armonk, NY: M.E. Sharpe. Jackson argues, "The basic analytical bet is that similar patterns of action in different contexts and in different sequences will generate different outcomes," p. 276.

bracketed. The rise in power of labor unions coincides with an obsession about linking wage rates to productivity statistics during this time. More pointedly, unions could disrupt production; the promise of linking wages to higher productivity aimed not only to provide disincentives for production stoppages, but in the age of Fordism, rising wages were supposed to elevate incomes to sustain demand. Labor was not exactly the exclusive focus on production, given the importance attributed to automation. But, although attempts were made to measure capital input, the exercise was considered by practitioners to be largely futile; the focus remained largely trained on the labor force.

As "more" became produced during the years of explosive growth, productivity scholars began looking at product differentiation and ways in which to measure consumer satisfaction. Hedonic regression techniques were brought out of the closet, improved and put to test. As product characteristics gained the attention of productivity economists and statisticians, new indexes were devised in order to try and capture these differences in product quality, as well as to account for the development of new products. With labor losing its primary focus and technology becoming more central in the production equation, new attempts were made to measure multifactor productivity in the years leading up to the IT revolution. At this time, scholars began trying to determine what accounted for shifts in the aggregate production function, as distinct from movements along the production function. A shift represented progress, where productivity gains translated into growth.

As the IT revolution gained momentum during the 1980s and 1990s, the discourse shifts markedly, with scholars beginning to invest large efforts in trying to solve the productivity puzzle. With the aggregate production function seemingly unable to represent a complex and rapidly changing economy, productivity scholars intensify their efforts to look at "micro-level" causes and measures of productivity. All that is elusive – intellectual products, intangible assets and organizational changes – nearly lend the debate a purely ideational focus. Productivity statistics become blurred with firm performance measures. What we mean by productivity becomes more closely associated with international competition at the firm level.

The following summary charts (figure 4.5 and 4.6) provide a broad-brush overview of how shifts in the scientific discourse have been conceptualized in this section.

Figure 4.5

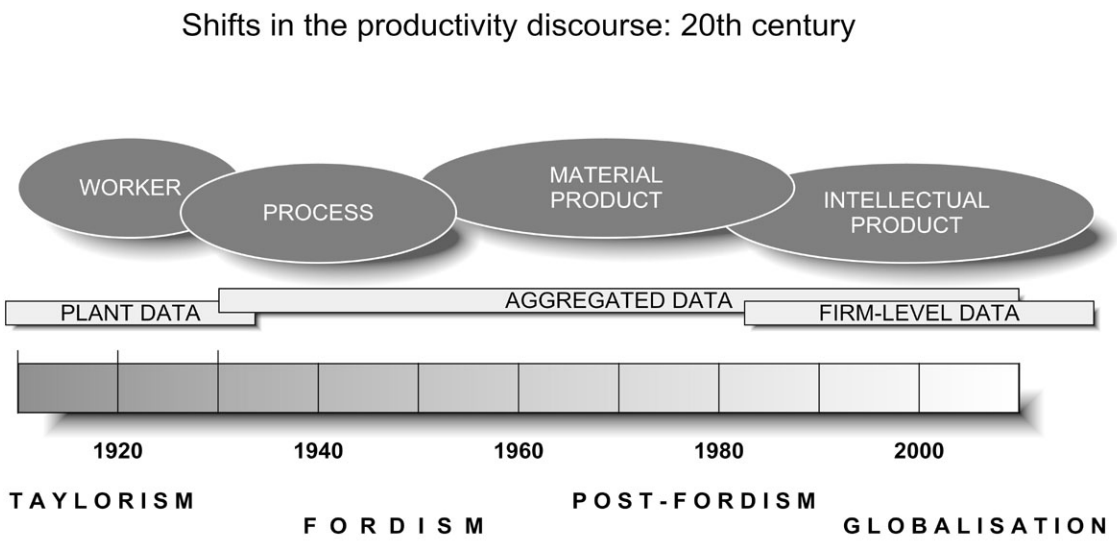


Figure 4.6

Summary of productivity conceptualizations over time

	Lens	Key statistical components	Performance gauge	Level of data	Legitimizing voice
1920s *Taylorism*	Man	Output/hour	Accident rate	Individual plants	Plant managers
1940s *Fordism*	Process	Wage cost	Production days	Aggregated	Economists
1960s *Consumerism*	Material product	Quality adjusted real output	Consumer valuation	Semi-disaggregated	Economists
1980s *Post-Fordism*	Intellectual product	R&D investment	Market share	Firm level	Management experts
*2000 Globalization**	International networks	Firm performance	p/e ratio	Individual company	Financial analysts

* This time period was not covered; as such it represents a kind of "reasoning by extension," or a plausible claim to explore

In the chapters that follow, the ways in which productivity statistics and the general discourse on productivity exert organizing effects in the French and US economies are presented. In particular, the claim is that the quantitative and rhetorical discourse on productivity was an integral element in public policy debates in both countries because the way in which we measure productivity – increasing output per input invested – suggests that more is available with less cost; the benefit accrues to the economy as a whole, as implied by what economists call "costless productivity growth."[584] As such, the discourse became a potent driver of policy passage. But, the construction of these statistics as revealed during the last century suggests that the way in which we attain productivity growth is still not completely understood. The statistics reflect an accounting exercise, imperfect in their conceptualization, and the way in which they are constructed and interpreted appear to shift in step with changes in the social context – the looseness of interpretation, in turn, provides the ambiguity needed to fuel public debates. Indeed, the argument could be made that the ambiguity may explain why different countries, or the same country at different points in time, handily use

[584] As described by Jorgenson and Griliches (1967).

the discourse for disparate ends. Narratives, of course, are inferred, not proven. But matching the scientific discourse with prominent socio-political debates happening in parallel can build evidence for the claim that dominating discourse exert real, material (organizing) effects on our economies. How? Productivity statistics and the theories about them, then, enabled the development of rankings against which countries could gauge their progress. Without the numbers, policy could not move forward.

Chapter 5: The productivity of "process" during the post-war years (overview)

As 1950 opens, renewed confidence prevails in the American economy. This confidence is in itself an element of strength … The relatively safe passage from inflation to greater stability was no accident. Businessmen, workers, and farmers demonstrated much greater judgment and restraint than in earlier similar periods … Their efforts were aided by public policies which had been developed over the years and had been improved by experience … This effective team between free enterprise and Government confounded the enemies of freedom who waited eagerly, during 1949, for the collapse of the American economy … The great motivating force in our economic system is the perpetual will to move ahead, to use our skills and our resources more efficiently, to produce at lower cost, and provide a better and richer life for all our citizens. The American economy must expand steadily.[585]

Harry S. Truman (January 1950)

… France is determined to continue the vast undertaking of its restoration, which has been initiated at every level: economic, social, academic, scientific, technical and demographic. With ardor, France has begun to implement the comprehensive Plan, which can and should, in four years, carry her people to a level of existence never before attained and, all at once, a capacity and strength that it owes itself as well as what it owes others. But, precisely because the objective corresponds to extraordinary ambition, the nation knows that the work to be delivered and the obligations to fulfill must match the level of the results to be attained and that progress demands disciplined effort.[586]

Charles de Gaulle (December 1961)

Overview: world events and the direction of discourse

During the post-war years, and a little more than a decade apart, US President Harry Truman and French President of the Fifth Republic Charles De Gaulle expressed ideas to their respective populations that are oddly alike. One man, having never earned a college degree and the son of mid-West farmers and, the other, trained in elite military schools and the son of an academic from aristocratic parentage, both found themselves urging their people to sacrifice and commit to hard effort in order to promote their nation's economic well-being. One, leading the hegemonic power, and the other, guiding a war-devastated former power, were united in their belief that the populace would rise to the occasion and maximize production for a better standard of living. Both leaders accepted that individual initiative must be complemented by government action, either through policy measures or formal economic plans. For the two heads of state, looking forward is key to promoting action today. Neither leader explains the reasons that may have

[585] United States, Council of Economic Advisors (1950), *The Economic Report of the President: transmitted to the Congress, January 1950,* Washington DC: United States Government Printing Office, pp. 1-2.
[586] André Passeron (1962), *De Gaulle Parle: des institutions, de l'Algérie, de l'armée, des affaires étrangères, de la communauté, de l'économie et des questions sociales,* Paris: Librairie Plon, pp. 525-526

motivated this discourse of increasing production: memories of the Great Depression and a near-apocalyptic world war may have well colored their views that physical deprivation was the largest threat to political stability. And the fact that the leaders of two economies, with vastly different histories and capabilities, could single out such similar strategies for their population is noteworthy. What factor brought together the ideas of these two statesmen?

It could be argued that promoting prosperity has been a time-honored focal point of political speeches since the early formation of states; the idea of individual sacrifice for the collective good is not either an original summons to action.[587] What may be specific to this point in time is the urgency and that is attached to growing the economy, and the boundlessness of the objective: to expand "steadily," suggests a kind of pressure that is responding to extraordinary times. De Gaulle, in an earlier speech (1960), alludes to the devastation wrought by two World Wars and remarks how, since liberation, "… the tendency to be geared towards expansion has never ceased."[588] For De Gaulle, the urgency is linked to the "…acceleration of scientific and technological progress," and more particularly as it regards France's relations vis-à-vis other nations and empires with "rival ideologies."[589] For Truman, production is connected with economic stability and the sustainability of the country as whole – he explicitly calls on the need for increased productivity to avert a downturn.[590] Like De Gaulle, Truman refers to other nations – "enemies of freedom" – or, the countries against which the race is being waged. The statesmen are aware of growing competition among nations and ideological threats to their national identities. As De Gaulle concluded, "What remains questionable is how to accomplish these goals without France ceasing to be France."[591] For Truman, to be American means to export is moral leadership, supported by "material strength."[592]

[587] "… the state has a natural priority over the household and over any individual among us. For the whole must be prior to the part. Separate hand or foot from the whole body, and they will no longer be hand or foot except in name…." Aristotle (1992), *The Politics,* London: Penguin Books, p. 60
[588] Passeron (1962), p. 505
[589] This text comes from the 1961 speech, quoted at the beginning of this chapter. Ibid., p. 526
[590] US Council of Economic Advisors (1950), pp. 8-9
[591] Passeron (1962), p. 526
[592] US Council of Economic Advisors (1950), p. 17

Truman makes the explicit connection between growth and lower production costs, which he links to efficiency; the concepts of "production and productivity" fill the first 15 pages of his statement. For example, Truman remarks that, "wage adjustments are one historic method by which buying power has increased with increasing productivity,"[593] but then reminds those engaged in collective bargaining that wages are linked not only to the welfare of workers, but the economy as a whole – the implicit message is not to demand for more than what their productive efforts deliver. The theme of growing the economy to benefit all society is repeated throughout this text and represents one of the most politically potent aspects of the way in which "productivity" is defined: produce more with less – no one group need sacrifice. De Gaulle delivers a like theme, suggesting that workers stand to benefit from growth but, like Truman, also urges workers to consider the health of the economy as a whole: "… sometimes strikes appear useless, anachronistic even, because the French people understand the vital importance of developing France and that workers themselves and their organizations are assuming a larger responsibility for the studies, debates, and plans that organize the whole and each sector – the productive capacity of the nation."[594] And so, with the suggestive backdrop of a world emerging from war and depression and now entering a Cold War, the two leaders lay out the priorities: expand to provide benefits for all, demand discipline from each – workers, included. If, for all intents and purposes, the goals were the same, so was the source that would bring the goals to fruition: ever-growing productivity. How this source became interpreted on both sides of the Atlantic, as well as at different points in time during the last century, and how it came to exert organizing effects for both the French and US economies, can be inferred by analyzing the shifting discourse on productivity and some of its key discursive elements.

Evidence that would support claims: the policy discourse in France and the United States during the postwar years

As argued in the theory chapter, discourse is "productive" and can be evidenced, or at least inferred, by the transfer of ideas; transfer catalogs spread.[595] In the literature on the transfer of ideas and norms, there is no solid agreement for *why* it takes place, or whether the transfer of ideas takes place in a particular way.

[593] Ibid., p. 9
[594] Passeron (1962), p. 525
[595] See chapter 3, p. 93.

Barnett and Finnemore *hint* at a mechanism of spread by arguing that international organizations (IO), for example, proliferate discourse by being able to "fix meanings," as a source of power.[596] With regard to the role played by IO elites, they argue, "Armed with a notion of progress, an idea of how to create a better life, and some understanding of the conversion process, many IO elites have as their stated purpose a desire to shape state practices by establishing, articulating, and transmitting norms that define what constitutes acceptable and legitimate state behavior."[597]

It stands to reason, using this argument as a guide, that scientific elites, who were legitimizing meanings of productivity immediately during the postwar years, could play a similar role. Because US economists dominated the scientific discourse at that time, it would be reasonable to expect the direction of idea transfer to move from the United States to France. In fact, to discern the "productive" effects of discourse, it is not critically important to predict the direction of idea exchange; that fact that ideas take root and spread is important. Interestingly, not exactly a discourse scholar, Waltz argues convincingly for this mechanism of transfer when he describes how competition produces sameness: countries emulate best practices.[598] The two epistemic camps differ, of course, on what drives emulation. For constructivists such as Finnemore, practices may diffuse because those, who adopt new norms, see them "as the right thing to do," while for Waltz, the explanation is far simpler: survival. No matter the motive, could such be identified, tracing a transfer of ideas about productivity from the United States to France counts as evidence in favor of discourse effectiveness. Whatever spreads, produces outcome.

How would we expect to gauge outcome? As a potent, neutralizing message, we would expect the productivity discourse to influence many levels of economic activity, as well as empower institutions, either through their creation, or through an extension of their mandates as the discourse continues to spread and legitimize action. Per the work of Blyth on sequencing,[599] we would expect ideas about productivity

[596] Michael N. Barnett and Martha Finnemore (Autumn 1999), "The politics, power, and pathologies of international organizations," *International Organization,* 53: 4, p. 711
[597] Ibid., p. 713
[598] See chapter 3, p. 70 for a discussion of this point.
[599] See chapter 2, pp. 32-33 for a discussion of sequencing as discussed by Mark Blyth.

and its importance to economic organization to come before institutional empowerment or reconfiguration. New institutional powers and a link to the rhetoric of productivity can be only inferred, not proven. The counterfactual that must be posed is this: could this new institution or reconfigured institution have materialized without the rhetoric of productivity?

Policy debates are more directly revealing in the sense that "textual ethnography"[600] can isolate arguments that are crosscutting and, hence, be considered *causal* as policy passage facilitators. In the debates, it is important to understand what issues are most connected with concerns about productivity levels. Are concerns related either to the scientific discourse at that time? If yes, such would lend support to the claim that the scientific discourse is "productive" in influencing policy discussions. Does the way in which productivity is debated reveal a connection to a particular social context? If yes, such would provide evidence for the claim that the discourse on productivity is relative to a situation, a context, and not necessarily linearly progressive according to intrinsic, essentialist properties of productivity; what is essentialist is detached from context.

The scientific discourse, during the early postwar years, for example, emphasizes *cost minimization*. And cost, for the most part, is related to labor, the leading productive component (or the then "measurable" component) in manufacturing *processes*. In France, during the immediate postwar years, as in the United States, labor is relatively powerful.[601] And, the fact that capital is considered elusive to measure at this time, no doubt, intensifies the concentration on labor. Focusing on the productive *process* following the war effectively diminishes the emphasis on the raw power of *man,* as seen during the time when Taylorism was influential, and shifts to ways in which production processes can deliver labor-cost savings. Conducting textual ethnography of public debates on issues related to productivity can reveal whether or not the way in which productivity is conceptualized links to the social context, or whether it is detached from context, as would be expected of an essentialist, scientific law.

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[600] See discussion of this method in chapter 3, pp. 88-89.
[601] See chapter 9, p. 292 for an overview of labor union membership and other factors reflecting labor power for both France and the United States.

Finally, in the debates, we would look for contestation to the ideas, or meanings attached to productivity. Evidence of contestation suggests that dominant meanings are not inevitable givens, nor invulnerable – only accepted as "common sense" in the Gramscian sense of the term.[602] More specifically, if alternative notions of productivity or other performance measures can be fathomed and do resonate for a social group, it would be reasonable to assume that discourse is susceptible and that new interpretations of the discourse can take root.

[602] See discussion of "common sense," as described by Antonio Gramsci in chapter 3 on p. 70.

Chapter 6: The productivity of "process" during the postwar years (France)

Postwar policy discourse in France: overview

US influence in Europe, at the end of World War II, was not contested in any consequential sense. This fact, coupled with the building scientific discourse on productivity being developed in the United States, made for a powerful pull of ideas and resources from the US into France. This chapter explores the way in which productivity was framed in French policy documents, such as the early economic plans launched following the end of the second world war, and parliamentary debates, as well as how the discourse influenced institutional development in France. Key to this chapter in terms of advancing claims are the extent to which policy ideas about productivity reflect the scientific discourse at that time, as well as the sequencing of developments. For the latter, it is important to understand whether ideas influenced institutional development, or whether entrenched institutions caused the discourse to morph according to French standards and ideas. Finally, the extent to which the French bought the "ideas" of productivity or whether they were simply angling for aid can best be inferred by analyzing the public debates in France and discerning what issues drove policy passage.

The Marshall Plan and France: importing ideas (and resources) from the United States

The Marshall Plan[603] – the well-documented foreign-aid proposal that was signed into law as the European Recovery Program in 1948 – clearly did not introduce the concept of "productivity" into French vocabulary. As but one example, Neufchâteau's preoccupation with agriculture and his ideas about increasing its productivity at the beginning of the 19th century in France obviously long predated the American initiative.[604] Still, the influence of the Marshall Plan and its component programs to help advance European industrial productivity exerted a strong influence on the way the French and other Europeans

[603] The Organisation for European Economic Cooperation (OEEC) was created in conjunction with the Marshall Plan and its Conference of Sixteen, or those nations that agreed to participate in the Plan, on April 16, 1948. See http://www.oecd.org/document/48/0,3343,en_2649_201185_1876912_1_1_1_1,00.html
[604] Woolf (1984), p. 112

conceptualized productivity. The flow of ideas about productivity was steady and strong: the inspiration came from a prosperous power, and it thus became easily seeded in a war-devastated continent.

A key component in this comprehensive plan to help restructure and boost the economies of Western Europe was the role played by the US Bureau of Labor Statistics (BLS). Specifically, through its Productivity and Technology Development Division, BLS was mandated to offer European nations statistical assistance in gathering and analyzing productivity data, as well as to provide information on US production practices.[605] During the early postwar years, the chief of Productivity and Technology Development at BLS, James Silberman, played a high-profile role in the promotion of American practices. In *Actions de Productivité,* for example, Silberman is paraphrased from a 1950 (non-sourced) report as identifying the chief causes of low productivity in the French economy to include: flawed work organization; a deficit of standardized and specialized, as well as serial, manufacturing processes; and a dearth of studies on the manufactured product, as well as on product cost price, workstation and time requirements.[606] Silberman did not buy French arguments that poor productivity performance traced to devastation wrought by the war. Eventually, the French shifted their focus from the war to ways in which the Americans organized production.

The BLS claims that roughly $60 million was invested in technology assistance programs for Europe from 1948-1957. These funds financed study exchanges in Europe and the United States, as well as the provision of "technical information and services"; it is estimated that 24,000 Europeans traveled to the States for various production study missions.[607] When the Marshall Plan came to an end in 1952, the "cult of productivity" was taken over by a new agency, the European Productivity Agency (EPA), during that same

[605] Solidelle F. Wasser and Michael L. Dolfman (June 2005), "BLS and the Marshall Plan: the forgotten story," *Monthly Labor Review,* 128:6, pp. 44-52; both of these authors were employees of BLS at the time of this publication.
[606]France (1963), *Commissariat Général du Plan d'Equipement et de la Productivité, Service de la Productivité, Association Française pour l'Accroissement de la Productivité. Actions de Productivité, 1961-1962*, Brive, France: Imprimerie Chastrusse, Praudel et Cie, p. 53. More recently, James Silberman advocated the same Marshall Plan model for former communist countries, as a way to push these economies forward and ensure stability. See, James M. Silberman, Charles Weiss and Mark Dutz (February 1999), "Marshall plan productivity assistance: a unique program of mass technology transfer and a precedent for the former Soviet Union," *Technology in Society,* 18:4, pp. 443-460.
[607] Wasser and Dolfman (2005), pp. 49-50.

year.[608] The EPA essentially functioned as an "information clearing house,"[609] as well as a system of exchanges – a networking program, through which experts, business professionals, representatives from trade unions and technicians could create discussion forums.[610] Disbanded in 1961, EPA programs were transferred to various committees within the OEEC.[611]

Clearly, the various programs set up through the Marshall Plan, the BLS and the EPA worked together to create networks whereby the exchange of ideas could take place. The BLS, in particular, with its program to assist European countries in the technical measurement of productivity must be considered a primary mover in terms of spreading ideas about productivity. Without a standard measurement format, comparisons are not possible. Without comparisons, actions are more difficult to legitimize. This is not to suggest that the without the Marshall Plan exchanges would not have taken place (they did),[612] or that French policy-makers would not have used productivity as a rallying cry to action without the material support of the United States – the first French modernization plan, heavily framed by productivity concerns, was conceived before the Marshall Plan was signed into law. The Marshall Plan and the exchanges that took place under its sponsorship simply provided an official conduit for the exchange of ideas in a more concentrated fashion. The fact that the US government funded theses exchanges exposes the belief that ideas – not merely material aid – matter. And, the fact that American-born ideas such as Taylorism and Fordism had long influenced the French[613] before they sent missions across the Atlantic to study the "ways of productivity" reveals the power of dominating powers to seed discourse and, ultimately,

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[608] This argument can be found at: http://www.oecd.org/document/48/0,3343,en_2649_201185_1876912_1_1_1_1,00.html, pp. 2-3
[609] European University Institute (March 2002), "European Productivity Agency," Historical Archives of the European Communities, http://wwwarc.eui.eu/invpdf/inv-epa.pdf, p. 4
[610] Bent Boel (2003), *The European Productivity Agency and Transatlantic Relations, 1953-1961,* Copenhagen: Museum Tusculanum Press, p. 247
[611] European University Institute (2002), p. 4
[612] Exchanges between French company executives and their US counterparts before the postwar years are discussed on pp. 198-201.
[613] That these ideas influenced the way in which the French organized production is not contested in the literature – the extent to which the ideas were modified to "conform" to French culture and institutions is a matter of scholarly interpretation. See, for example, Robert Boyer, "French statism at the crossroads," in Colin Crouch and Wolfgang Streeck (1997), eds, *Political Economy of Modern Capitalism: mapping convergence and diversity,* London: Sage Publications, p. 85

generate its own "pattern of activity,"[614] however modified to serve the particular cultural context under study. It is of interest to discern the source of ideas. But to understand the ultimate power of ideas to exert organizing effects in particular social contexts, it is important to trace the ways in which ideas – or discourse, more generally – does its work by legitimizing its claims and conferring promise to those, who follow.

The first modernization plans

In France, the productivity discourse figured prominently in the modernization plans, produced by the *Commissariat Général du Plan* (CGP, General Planning Commissariat),[615] that were to influence economic decisions in the country throughout the century. Jean Monnet, of course, is long recognized as the creator of the first modernization plans in France. What is less well known, or acknowledged, is what scholars claim to be the extraordinary influence of American ideas, such as those of the New Deal economist, Robert R. Nathan, on the development of the first modernization plans.[616] Monnet's involvement with American political and business elites – Franklin D. Roosevelt, for one – and his complex relationship with De Gaulle, for another, provides a fascinating narrative on the transfer of ideas and their "organizing" potential – as if it were, really, "people all the way down."[617]

The first modernization plan covered 1947-1952 and was set in motion following its approval by the presidential cabinet in January 1947 – the plan was not subject to parliamentary approval.[618] In the first advisory session of the plan in 1946, during which the goals of the first plan are designated, it is made patently clear that France lags behind the United States in terms of their productivity: "Without waiting for

[614] According to Patrick T. Jackson, "A discourse is a pattern of activity, and not a structural constraint; specific performances and particular arrangements of discursive resources cannot fail to be of great importance." See Jackson (2006), *Civilizing the Enemy…,* p. 76. This definition is discussed in chapter 3 under the "Method" section.
[615] Prime Minister Dominique de Villepin disbanded the *Commissariat Général du Plan* and replaced it with the newly created Centre d'Analyse Stratégique in 2006.
[616] See, for example, Sherrill Brown Wells, "Monnet and 'the insiders': Nathan, Tomlinson, Bowie, and Schaetzel" in Clifford P. Hackett, ed. (1995), *Monnet and the Americans,* Washington DC: Jean Monnet Council, pp. 198-204
[617] Ibid., and André Kaspi (1971), *La Mission de Jean Monnet à Alger, Mars-Octobre 1943,* Paris: Publications de la Sorbonne, Editions Richelieu
[618] John Hackett and Anne-Marie Hackett (1963), *Economic Planning in France,* Cambridge, MA: Harvard University Press, pp. 25-26. De Gaulle, as head of the provisional government following the end of the war, signed the decree that created the technical body to develop the plan.

study results … comparing France and the United States, it suffices here to state that in industry, the American worker generally produces three or four times that of the French worker and in agriculture, a French farmer, on average, feeds five consumers, while the American farmer feeds fifteen."[619] (It is noteworthy that comparative levels were accepted as legitimate before the study results were available.) Such claims will be repeated in subsequent communications about modernization plans and in France's legislative chambers: the US will figure as the reference country in terms of production and production technique, and France, famously or allegedly content to promote its own destiny and manner of being, will cast continuous looks across the Atlantic when such issues surface. But there is a second reference country: Germany. Why hasn't France reached its potential and lags the US? In this report, the French lay blame on their neighbor and events from 1911 to 1939, events that "other countries" escaped and could, thereby, focus instead on developing their industries.[620] From this initial session, intended to launch the direction of the first modernization plan in France, it is difficult not to infer that perceived competitive pressures drove policy forward.

The consultative body goes on to suggest that "… it is necessary for a country with limited population such as our own to improve our work productivity and to fill the gap separating it from that of foreign countries through the modernization of methods and an increase in production machinery."[621] More specifically, the measures identified to achieve heightened productivity include: (1) the concentration of firms (2) the renovation of equipment and the development of technical research (3) the specialization of firms and the standardization of manufacturing processes (4) development of training programs and professional qualifications (5) work organization.[622] Arguably, the list could work on either side of the Atlantic, with the possible exception of "firm concentration." Why? The steel industry in the United States, for example, had already by this time been the recipient of $2.7 billion dollars in government aid, with 20 joint ventures having been formed between government and private enterprise. Even when the government assets had

[619] France (1946), *Commissariat Général du Plan de Modernisation et d'Equipement*, *Documents Relatifs à la Première Session du Conseil du Plan: 16-19 Mars 1946, Paris: Imprimerie Nationale*, p. 6
[620] Ibid., p. 6. This point supports the claim by James Silberman that depressed economic activity in Europe was often blamed on the war, rather than deficient production techniques, per se. See Wasser and Dolfman (2005), p. 48
[621] Ibid., p. 8
[622] Ibid., p. 30. These points fall in line with those singled out by James Silberman. See p. 173.

been sold to private concerns, following the war, collusion among a concentrated steel industry were claimed to have thwarted the entry of new competitors.[623] The case could nearly be made that, while policy rhetoric in the US expressed a fear of concentration and government involvement – perhaps because it had already reached a critical stage of concentration – the other side of the Atlantic aggressively advocated firm concentration, as a means to boost productivity in fragmented industries.[624] The basis for doing so could have been to reap gains from economies of scale, or simply to emulate "best practices" of successful competitor nations, such as the United States. Although the former no doubt holds true, it is the latter that successfully moves policy; policy calls are referenced to the United States, not to a law of economics.

Before the official launch of the second plan, a report by the CGP in 1950 provided a preview of objectives to be achieved by the second plan.[625] In this plan, authorities are particularly concerned by the need to render the country self-sufficient: foreign aid from the Marshall Plan was predicted to end in 1952.[626] France, the commission writes, has a moral and economic obligation to wean itself from American aid, lest plummeting standards of living "strangulate the economy," threatening workers and civil liberties alike.[627] The call to action is summed up in one phrase: "A country's potentialities depend upon and are limited by its production."[628] But heightened production cannot be achieved without investments that (1) increase demand to grow markets and (2) modernize industry.[629] Perdition can be avoided only by wanting more, producing more, by being more productive – and it concerns the country as a whole. France will draw upon the slack available and needed to strive higher.[630] This message is repeated over and over again in official documents, and it is this message that drives policy forward.

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[623] Harland Prechel (October 1990), "Steel and the state: industry politics and business policy formation, 1940-1989, *American Sociological Review,* 55:5, p. 653
[624] The push to promote concentration in the French steel industry is discussed on pp. 198-201.
[625] France (1950), Presidence du Conseil, General Commissariat of the Modernization and Re-Equipment Plan, *Report of the Commissioner General on the Modernization and Equipment Plan of the French Union, 1947-1949 Realizations and 1950-1952 Objectives,* Paris: Imprimerie le Moil et Pascaly
[626] Ibid., p. 15.
[627] Ibid., pp. 15-16
[628] Ibid., p. 20
[629] Ibid., p. 25
[630] See discussion of "slack" as described by Hirschman (1970), in chapter 2, p. 19

The commission then goes on to urge that all industries, "…rationalize production in order to reduce production costs and selling prices."[631] More pointedly, the only way for France to achieve economic independence, meaning steady growth and a balanced budget, is through (1) increased productivity and (2) limited government expenditures. Increased productivity is equated with an increase in the standard of living, "in the same proportion"[632] – productivity is the *only* way to advance the standard of living. With labor shortages threatening the achievement of higher production levels, the commission ardently advocated new production *organization* in order to achieve productivity gains. At a more operational sense, higher productivity "… makes possible lower prices without lower wages or higher wages without higher prices."[633] Export markets open. No one loses – all regions in France stand to benefit.

If this left any doubt as to the mission of productivity, the commission then goes on to stress, "With the assurance of these outlets for increased production, improved productivity will guarantee the French economy against the risk of recession and should allay the fear of overproduction and overequipment [sic], which recent economic events have produced."[634] The end goal is, in reality, not just a higher standard of living, it is *raw competition*: "Both the framework of the Plan, therefore, and the *National Productivity Council*, through the use of modernization commissions and technical exchanges with the most advanced countries, provide for concerted action to help improve the productivity of various sectors of the French economy and their ability to compete with foreign countries."[635] In a later section of the report, this goal is reiterated: "Generally speaking, it is a question of making the French economy competitive, if not with the United States, at least with the most highly developed nations of Western Europe."[636] In other words, the French are less concerned by ideological threats from the Soviet Union, than by their economic standing relative to the US and western Europe.

[631] France (1950)., p. 28
[632] Ibid., p. 29
[633] Ibid., p. 29
[634] Ibid., p. 30
[635] Ibid., p. 30
[636] Ibid., p. 35

With these goals in mind, ***the second plan was launched for the years 1954-57***. The language in this plan is similar to that of the first plan. Under the title, "Modernization and methods," the plan declares that modern machinery on its own will not ensure the lowering of price necessary for the expansion of French industry.[637] The statement is interesting because it betrays the ultimate goal – growth – and its primary mover: cost price. The plan then goes on to suggest that modern equipment can only produce a fraction of its capability unless it is utilized at its full potential, by doubling or tripling work teams. This strategy is to be complemented by modernizing processes, such as firm specialization and methods that encourage "productivity." Most interestingly, the plan specifies the role of the state in terms of expanding industry. The state is not to place a break on initiative but to exert influence either through credit provision, fiscal measures or through its attitude as a client of industry towards its suppliers.[638] The language is reminiscent of the quote by Truman, cited at the beginning of this chapter, whereby government and industry, together form an "effective team."

The modernization methods specified in this plan differ slightly from those listed in the first plan. The goal, too, has changed. In 1946 plan authorities listed ways to improve productivity, while in the second plan, the consultative body identifies measures key to expanding French industry, with productivity presumed to cause growth: (1) specialization (2) organizational/productive methods (3) standardization and quality control (4) relations between suppliers and clients – the state and public companies as clients.[639] The way in which each of these measures is described is telling in terms of the social narrative that is revealed. For example, it is noted that other countries, which consolidate their industries and encourage specialization, boast superior productivity levels. In fact, how these levels are measured is not indicated, but the focus falls on cost price, which is presumed to decrease as specialization and production in series increases. The planning authorities, again, comparing themselves with practices in other countries, suggest that all measures must be undertaken to ensure a regrouping of companies in France, including "business sector exchanges" among firms. The text also refers to a "decree-law" passed on August 9, 1953, the intent of

[637] France (1954), *Commissariat Général du Plan de Modernisation et d'Equipement. Projet de Deuxième Plan de Modernisation et d'Equipement: 1954-1957, Exposé de la Situation et Exposé du plan*, Paris: n.d., p. 55
[638] Ibid., p. 55
[639] Ibid., pp. 55-59.

which was to ensure fair competition and specialization, while discouraging price distortion. Once again, productivity is the rallying cry to ensure competitiveness, *with cost price serving as proxy for productivity.* Interestingly, the focus on cost price parallels developments in productivity statistical measures during this time, with wage cost being factored into calculations for labor productivity (unit labor cost = hourly compensation/productivity).[640]

Under the discussion concerning organizational and productive methods, the goal, again, is stated to be cost price reduction. To motivate employees to adopt modern organizational methods, it is suggested that profit-sharing plans be offered to employees so that they may share in the fruits of heightened productivity. The government is to aid the mission by awarding financial and moral support to the various centers of productivity,[641] mandated to help apply these measures. Under the section, standardization and quality control, these two elements are to lead to heightened productivity, which will then translate into the more favorable returns (or lowered cost price). Standardization leads to improved quality and regularity, which, in turn, translates into improved productivity (and thereafter, into favorable returns). As seen in the development of statistical measures, quality becomes associated with standardization: predictability and regularity, as seen by the "diffusion of quality brands."[642] Quality is, then, associated with process – as with statistical measures developed during this time. Under the last heading, relations between the state and suppliers, the end goal, again, is to prevent the increase in cost price, which occurs when public powers fail to coordinate their actions or deliver orders in a predictable way; without the latter, manufacturing in series is rendered impossible. Organizational efforts in France, during this time are focused on serial production – an utterly banal finding, were it not for the hypothesized power of the productivity discourse to set it in motion. If standardization were a given in French industry, for example, it would not have been highlighted in the way it is in the discussion of the second modernization plan – *this is a counterfactual*. Productivity legitimizes the effort to reorganize: in this generic "edict," managers are encouraged to help employees understand that their effort translates into benefits for all, including themselves. They will receive "more"

[640] This is the definition used by the BLS on their web-site: http://www.bls.gov/lpc/faqs.htm#P06
[641] The different productivity centers in France are discussed in the section to follow.
[642] Ibid., p. 57

than what they invest in the process – otherwise, there would be no incentive to alter the ways in which they are used to operating.

Plan implementation and the role of parliament. It should be noted, first, that the modernization plans were not directives issued by the government, which forced industry to comply. Historians have posited that, "The Plan is a way of providing permanent arrangements for a collective and systematic reflection on the problems and prospects of the economy with a view to action."[643] Hence, the usual term used to describe the French planning process: indicative planning. In this way, the plans became a bargaining vehicle between government and industry – a kind of continuing dialogue between the parties involved. For the consolidation of the steel industry, as one example, government policy was promoted by offering incentives, not penalties:

> The 1946 plan constituted a detailed program for reshaping the industry through changes in ownership and in the direction of investment. The Planning Commission did not itself formulate the details. It did initiate the process of drawing up the program, select the industry and public officials who worked it out in group discussions, and provide guiding estimates of raw material supplies and steel markets. It did not get agreement for cooperation by all producers. The plan was a product of government-industry coordination, not a unilateral order issued to the producers from the outside.[644]

The result obtained, then, came from the exchange of ideas – perhaps grounded in material interests – but most importantly, and first, an *idea* about *what* the interest was: to compete with the United States in terms of productivity levels. To attain this idea, industry had to be reorganized. Industry did not organize itself on its own, responding to economic laws relating firm size to optimal production cost levels. Investment incentives were necessary to move industry in the direction agreed upon through deliberations between industry and government.

Much has been made in the academic press about the extent to which French "planning" is a democratic process or not. Early scholars made the case that planning was inevitable for a country emerging from war for several reasons: (1) the sheer devastation required a massive effort to take inventory and outline immediate goals for survival – numbers had to be crunched (2) US assistance required a documentation of needs and direction of goals and (3) the fact that key industries were being nationalized per the political

[643] Hackett and Hackett (1963), p. 363. Emphasis in the text.
[644] Sheahan (1963), p. 70

bargain struck between the De Gaulle and the National Resistance Council[645] implicated government planning, nearly by definition.[646] Does it then matter, whether the French parliament played a critical role in the design and execution of the early plans? It matters to the extent that, if the productivity discourse, or the "deployment of rhetorical commonplaces"[647] on productivity, acted as forceful movers in the French economy, then we need to know for *whom* the legitimizing claim has purchase and needs purchase in order to exert its effects. The fact that the modernization plans went into effect and were forcefully organized around the concept of productivity growth implies that the elite decision makers – be they in the Ministry of Finance or in the Office of the Prime Minister – essentially embraced the concept.

Parliament was not called upon to approve either the first or third plan; the plans were authorized by the administration.[648] The second plan, by contrast, was debated in parliament, but only after it was drafted and in force: it had been submitted to parliament in 1954, but parliament did not vote on it until 1956.[649] For all intents and purposes, the second plan escaped parliamentary scrutiny like the first and third plans. The fourth plan, by contrast, was subject to lengthy public debate by the National Assembly. What did parliamentary approval mean? According to scholars of the French planning system, the fourth plan was not voted as law, but as an annex to a draft law. The argument on the part of the government is simply that the plan does not have "imperative value," but represents "… a combination of objectives, options and goals which the Government set out to implement."[650] In order to exert as much "binding" influence as possible, parliament was in the game of shifting commitments described in the annex over to the draft law.[651] This dynamic suggests at least one source of tension between the government and parliament. And, in this case, it is important to note the extent to which the productivity discourse played out in these

[645] See footnote 183, chapter three.
[646] Wallace C. Peterson (April 1957), "Planning and Economic Progress in France," *World Politics,* 9:3, pp. 352-353.
[647] "Legitimation claims are through and through rhetorical, in that they are forms of speech designed to achieve victory in a public discussion … collective or shared discursive space," Jackson (2006), *Civilizing the …,* p. 27
[648] The general planning commission was directed by the Prime Minister's office in 1946. Hackett and Hackett (1963), p. 38. For a discussion on the third plan, see p. 31
[649] Ibid., p. 27
[650] Ibid., p. 195. The quote was taken from *Débats Sénat,* July 12, 1962, p. 927.
[651] Ibid., p. 195

debates; debates reveal what arguments are crosscutting and what rhetorical resources are available to legitimize policy.[652]

But plan implementation did not stop at the parliamentary vote. For the public sector, the parliament vote begins a process of implementation, which is followed by votes on expenditures for specific programs. The Ministry of Finance plays a key role in granting approval for these programs. What the plan appropriates and details for the public sector is considered to be "obligatory," in terms of implementation.[653] The plan, in terms of orchestrating finance for the public sector, and in particular for the nationalized industries, has, then, a direct organizational force. In the private sector, the role of planning was more ambiguous. It has been noted that production targets, for example, were aggregated at the industry level: individual firms were not subject to specific quotas. Government would be more likely to look closely at key industries and apply measures to ensure that planning objectives are achieved.[654] In this gray zone of "obligation," the government can appeal to one of several measures to help orient action: (1) public-sector purchasing policy (2) price control (3) credit and finance (4) fiscal incentives.[655]

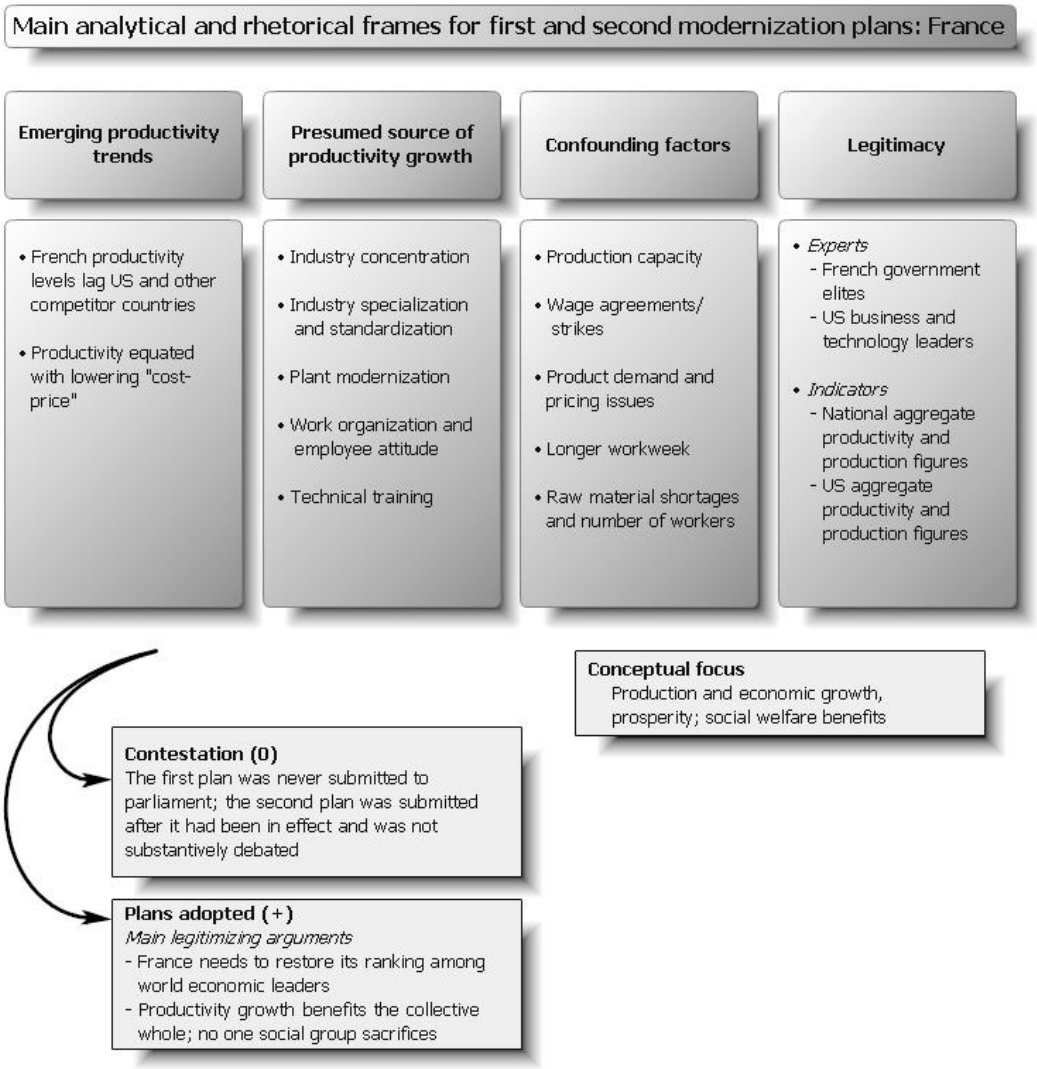
It is important to understand the mechanics of persuasion: policy, at some point, becomes coercive. That is, although a legitimizing discourse may help draft and pass policy, responding to a collective call to action, individual firms are unlikely to carry policy out without an incentives system. Such does not detract from the power of the discourse to effect change. The effects occur through a process. If the call to productivity and rising production mobilize the French elite to draft a planning process, and this planning apparatus is then mandated to help ensure that targets are reached, the scenario fits perfectly well with a theory of collective action. [656] Without the call to collective action, through some legitimizing concept, policy consensus is difficult to achieve. During the postwar years in France – achieving productivity growth to render the economy competitive and make France glorious again – resonated with French elites and the

[652] The public debates on the fourth modernization plan are discussed later in this chapter, beginning on p. 213.
[653] Ibid., pp. 23-246
[654] Ibid., pp. 261-262
[655] Ibid., pp. 262-270
[656] In a sense, the public good in this case is "productivity" and/or economic growth. The issue of incentives is famously explored in Mancur L. Olson, Jr. (1965), *The Logic of Collective Action,* Cambridge, MA: Harvard University Press.

populace. De Gaulle summed his clarion call for all to sacrifice and work towards this goal: "French citizens, grand citizens: pride, bravery and hope!"[657]

The summary chart below (figure 6.1) details the main elements of the postwar policy discourse in France as it relates to ideas about productivity.

Figure 6.1



[657] Passeron (1962), p.493. The call is taken from a speech by De Gaulle delivered on December 12, 1958.

Reported results from the first plan. Shortly after the launch of the first plan, a series of government publications were issued to report on the progress made at particular intervals. In a document reporting on results up until the end of 1947, authorities outline disappointments with energy production, which they attributed to manpower issues.[658] Specifically, coal extraction was noted to drop. The numbers of workers in this sector was maintained at 220,000, but daily output per worker declined from 962 kg during the first half of 1947 to 942 kg during the latter half; the commission had reckoned with labor productivity at 1,045 kg. The commission also reports a worker absenteeism of 17% – or twice the rate before the war – and noted two strikes, in June and in November-December, resulting in a total loss of 3,400,000 tons of coal extracted. Imports made up the deficit.[659] The commission links the loss of coal extraction in France, as well as insufficient deliveries from Germany, to the diminished steel production: in 1947 total production reached 5.8 million tons, up from a level of 4.4 million in 1946, but below the 6.8 million figure for 1938. Authorities reckon that, without further strikes, production in 1947 would have reached plan target, or 6.2 million tons.[660]

The report provides a good indication that the pitch for productivity was not everywhere accepted; the rhetoric had failed to resonate with coal miners, for one, who decided to strike rather than work for "collective prosperity." In fact, given the disappointing production results, the planning commission focuses on manpower and the need to ensure a steady supply of workers, as well as to enhance labor productivity. Authorities reckoned that unskilled labor was in sufficient supply, but that skilled labor would fall short of future demands. Professional training programs did increases, from 125 to 196 from the start to end of 1947 and students enrolled increased from 7,976 to 15,670; still, the commission lamented that a lack of funds had prevented the number of enrolled to reach targeted levels: 30,000 in building and public works and 20,000 in metallurgy.[661] And although production had attained 106% of 1938 levels by June

[658] France (1947), General Commission for the Modernization and Equipment Plan, *Second Half-yearly Report on the Modernization and Equipment Plan* (Results up to December 31, 1947), First Part: General Survey, Paris: nd
[659] Ibid., p. 15
[660] Ibid., p. 20
[661] Ibid., p. 22

1947, strikes had been estimated to cost the country 4% in working days. By the start of 1948, however, the level rose higher than that attained in 1938.[662]

This progress, authorities concede, is somewhat deceptive. Increased production is noted to be due to a longer workweek: in 1947 the workweek averaged 45 hours, compared with 39 in 1938. The commission then reminds readers that reparations from Germany will never cover the damage suffered in France, which is why the French people must pull themselves up by becoming "efficient" – productivity is calculated to be 25% of the pre-war level and at the same unimpressive level as that measured in 1944-45. Many reasons are attributed to low productivity levels, including bad food and heating conditions, a dearth of labor training programs, labor disputes, a doubled rate of worker absenteeism (obliquely attributed to social security guarantees), and unsteady levels of raw materials and energy sources. But, the commission concludes, the most obvious reason for the non-performing levels are dated production plants; hence, the need for modernization plans.[663] So evidently revealed in this seemingly simple passage, low productivity relates to every problem; increasing productivity, by reverse logic, can solve all problems.

Jean Monnet, the General Commissioner, opens a commission report on plan results achieved from 1947-1948. Productivity remains the call to action in this brief introduction. Productivity, he writes, will require a "renovation in our methods of production," and "… is the only means of increasing the real purchasing power of the mass of consumers … as well as avoiding the risks of selling at a loss."[664] Productivity, then, is equated with the standard of living, which, in turn, is linked to purchasing power. Selling at cost, or for profit, can be attributed to many causes; the link to productivity is elusive. If wages are inflated, relative to productivity, raising productivity levels is unlikely to remedy this, because it would imply that wages reflect collective bargaining agreements and other market constructions, not an equilibrium level that

[662] Ibid., pp. 23-24
[663] Ibid., pp. 35-37
[664] France (1949), Presidence du Conseil, Commissariat General of the Modernization and Re-Equipment Plan, *Two years of executive of the plan of modernization and equipment, 1947-1949 (Fourth semi-annual Report on the carrying out of the plan of modernization and equipment),* Paris: Imprimerie Le Moil et Pascaly, p. 6. *Note*: this report has been translated into English; translations differ, which is why the commission is sometimes referred to as the Commissariat General; other times it is translated as the General Commission, which is a less dated translation.

reflects objective productivity. The claim demonstrates the how broad the net cast by the productivity discourse; rhetorically, productivity is the chief arbiter of economic organization.

In this report, the shortage of manpower so feared in 1946 has been resolved through a mix of strategies: the "arrival" of 100,000 Northern Africans, the inclusion of 150,000 foreign workers, the transformation of 137,000 German prisoners of war into "free laborers," and, lastly, an increase in productivity. Labor productivity is claimed to have risen due to a "general increase in production," as well as the integration of new equipment and novel organizational methods.[665] The link between productivity and production begs interpretation – it has already been stated that the workweek was extended; such does not, formally speaking, count as an increase in productivity. The terms are often conflated. Curiously, the commission is quick to point out that the labor productivity statistics may be unreliable because the numerator (production) and the denominator (labor hours) are calculated by different government institutions, using different methods of data assembly, as well as taking data from structurally different regions.[666] Nevertheless, these statistics are documented in a table and, the commission claims, provide a broad idea of productivity trends. All major industries (agriculture is not listed, though discussed in the text as having risen in 1947 due to propitious weather conditions and increased mechanization) post substantial increases from 1946 to 1949, with metallurgy and mechanical industries posting the largest gains, from 51 to 102 and 56 to 108, respectively (1938 = 100).[667] Once printed, it can be intuited that the numbers become *real.*

The commission notes efforts to seed productivity enhancement through technical training and exchange programs. But in addition, the commission describes the following legislative initiatives that were passed on the premise that they would improve productivity: (1) Law no. 48-478, June 16, 1948 (articles 10 and 11), which essentially aids in the regrouping of factories (approved by the Minister of Finance, on recommendation of the General Commission) by limiting asset rights. This particular law (article 10), for example, helped regroup the steel concern Usinor in northern France in order to install the first strip mill.

[665] Ibid., p. 47
[666] Ibid., p. 48
[667] Ibid., p. 49, table 11

The law (article 10) also helped create groups specializing in specific industries, such as machine tools and oil refineries. This law (article 11) also resulted in the purchase of 23 concerns, helping to regroup industries, again, such as machine tools, iron mines, and oil companies. Law no. 48-1228, July 22, 1948 establishes the "legal status of industrial technical centers," whereby management and technical experts from companies can convene and cooperate in order to ensure technical advances, improvements in productivity and product quality at an industry level.[668] Did these laws generate lasting and important organizing effects in the French economy? That is a difficult question to answer. It can be assumed that such laws helped to concentrate and spread the development of ideas. At a minimum, it shows the power of a legitimizing concept to initiate legislative change.

The commission concedes that equipment modernization plans, claimed critical in the effort to boost productivity, suffered, owing to raw material shortages and financial pressures. Still, in a key industry, such as steel, progress was said to be made, with new blast furnaces being built for four steel works, and many more in progress; blast furnace repairs were carried out for another six works, with 18 additional in process; sheet mills – one area of priority – were being developed for 16 concerns at the time of the report writing; and other plans were under way for numerous other works.[669] These results qualify as "activity"; it is part of the discourse, the pattern of activity that continues to emerge in an effort to achieve "productivity."

In this 1949 report, the commission writes about the difficulties of keeping inflation at bay while promoting economic progress and full employment. The Department of Treasury[670] subsequently tightened its hold on investment direction. Indeed, by decree (June 10, 1948), an Investments Commission was established at the Treasury, to "harmonize" investment with resources available, "… as well as selecting from these

[668] Ibid., pp. 51-52
[669] Ibid., see table 18, pp. 84-85
[670] Interestingly, the enhanced powers of the Treasury are defended in this report: advances to private companies were increased during this year, skirting parliamentary control. The commission declares this move to be a more "flexible" system than one that "fixes" budgetary credits at levels that may or may not be in line with need, as it evolves. In response to the criticism, parliament was then asked to approve these "special accounts." Ibid., p. 158

expenditure programs the most productive from an economic point of view."[671] Although it is not clear what the criteria for "productive" are, labeling the selected projects as "productive" no doubt exerts a legitimizing effect. Productivity is also called to help settle disputes among individual investors, who – according to the commission – probably believe that they could advance more quickly with a greater number of credits. The commission argues that, "… what is true in each individual case is *not* true for the whole."[672] Industry must, then, develop its output potential by increasing its productivity and mechanization in order to not draw workers away from other sectors.[673] In other words, concern is not directed towards individual firms, but for the economy as a whole.

The commission reports a 25 percent increase in private investments from 1947 to 1948. This positive result is linked to the modernization plan insofar as it has provided investors with a sense of certainty – precisely what was lacking following "Liberation." In other words, the heightened production activity has guaranteed returns for "equipping industries," such as iron and steel.[674] The effects of the plan, then, are claimed to exert many rippling effects in the economy.

In the government report published in 1950 outlining the achievements of the first plan and the objectives for the next plan, the commission declares that production in France has increased by one-third in the three years following the first plan's launch.[675] This result is linked directly to the plan and is largely attributed to a workforce enlarged by 300,000 persons, and a workweek extended to 45 hours, as mentioned in the 1947 report. The report also indicates a rise in labor productivity – defined as output per hour worked – now equal to its prewar level (having declined by 25 percent during the war).[676] If manpower and hours worked have increased, the rise in productivity, assuming it is correctly measured, must either come from use of previous idle capacity, economies of scale, or the elusive "black box" of productivity growth (the residual) – unlikely at a time following a major historical break in economic conditions. If labor productivity

[671] Ibid., p. 153-154
[672] Ibid., pp. 156-157
[673] Ibid., p. 157
[674] Ibid., p. 160
[675] France (1950), p. 8
[676] Ibid., p. 10

increases because of better quality capital inputs, such would not count as productivity growth, per se, but a movement along the production function. But, a policy report is not an academic exercise: noting productivity growth by 25 percent – an unsurprising acceleration following war – still, helps legitimize policy. The commission claims production growth to be a direct result of investment, as funds were allocated to nationalized industries, which then increased their orders from private suppliers. The heightened economic activity boosted their production, as well as contributed to the modernization of their systems of production.[677] The report authors conclude that, with this success, France "… has *turned her back on the decadence* which threatened her."[678] The outcome is as Polanyi might have predicted.

Although in some government reports, the decline of France's production level relative to "the world" was pinned squarely on the shoulders of the Germans, in this report the commission attributes the outcome to equipment obsolescence.[679] One statement is political, of course. The other provides a policy call for investment and growth, by which success can be measured. The commission notes the fall in investment, occurring in 1929 – a trend that continued up until the start of the Second World War. Steel factories in eastern France were noted to date back to 1914, those in central France even earlier; factories in the northern regions of the country were only slightly newer, having been renovated following 1918.[680] After describing lurid living conditions of farmers and the lack of new housing investments, the commission declares, "Such is the process of decay, which the Modernization Plan, by renewing the productive potential of France, is combating and which the Plan has already succeeded in stopping and reversing."[681] Again, productivity prevents decay – it is hard to imagine a stronger, clearer call to action.

Industry concentration and productivity: the example of steel

The effects of the discourse can be seen in the way the steel industry was concentrated following calls in the first plan to do so as a means of elevating productivity levels.[682] In this plan, for example, a committee

[677] Ibid., p. 11
[678] Ibid., p. 11. Emphasis in the original text.
[679] Ibid., p. 12
[680] Ibid., pp. 12-13
[681] Ibid., p. 14
[682] See discussion of law no. 48-478 on p. 187.

for the modernization of the steel industry noted that France had 177 steel plants, together producing 12 million tons; the plan calls for a maximum of 12 basic producers and 12 specialty producers.[683] Did this happen? Development economist John Sheahan – whose work squares with this estimation on postwar industry organization in France – indicates that, "By 1954, 86 percent of all workers were employed in plants with 1,000 or more employees."[684] Sheahan then goes on to write that a series of mergers and coalitions created a steel industry more concentrated than the case for England or Germany, but less than what characterized the industry in the United States: in 1957 four companies accounted for 57% of industry output in France, while in the US the top four countries produced 65% of total output.[685]

The extent of industry centralization is densely detailed in the work of scholar Michel Freyssenet,[686] who traces the consolidation of the French steel industry following the launch of the modernization plans.[687] In 1948, for example, Usinor was created from through the merging of Denain-Anzin and Nord-Est – two large steel groups in northern France.[688] To follow in 1950, French steel concern, Sidelor, was formed from four plants – Auboué, Homécourt, Rombas, Villerupt-Micheville – following a decision on December 16, 1950 by the French General Assembly.[689] Also in 1950, Wendel et Cie was formed by Petits-Fils de François de Wendel and de Wendel SA – a merger based on legal and financial grounds. Lorraine-Escart followed in 1953, combining Senelle-Maubeuge, Longwy and Escaut et Meuse.

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[683] France (November 1946), *Commissariat Général du Plan de Modernisation et d'Equipement*, *Premier Rapport de la Commission de Modernisation de la Sidérurgie,* Paris: n.d, p. 31
[684] John Sheahan (1963), *Promotion and Control of Industry in Postwar France,* Cambridge, MA: Harvard University Press, p. 70
[685] Ibid., p. 71
[686] Michel Freyssenet is known for his work on productive models and is Research Director at the National Centre of Scientific Research (CNRS) in Paris.
[687] Michel Freyssenet and Françoise Imbert (1975), *La Centralisation du Capital dans la Sidérurgie, 1945-1975,* Paris: *Centre de Sociologie Urbaine* (with the collaboration of Marco Diani and Christiane Veauvy)
[688] Ibid., p. 9 and http://www.fundinguniverse.com/company-histories/USINOR-SACILOR-Company-History.html; In 1956, Usinor, according to this web-site, announced that it would specialize in the production of steel sheets.
[689] Ibid., p. 7-12. The creation of this groups is stated to ensure a regular supply of raw materials and to develop products in the most economical way possible Ibid., p. 15. (The text mistakenly refers to Sidelor as Sacilor, as evidenced by the source footnoted.)

By the time of the fourth plan, the call for concentration in this industry continued.[690] Interestingly, in this plan, commissioners are quick to point out that steel concerns in Great Britain and Germany are "huge," which is why France must continue its effort to concentrate steel concerns, "happily already begun," but in need of continuing with "rigor."[691] The message is reiterated, with purpose directly linked to international competition: "… the effort to continue to concentrate and specialize in scientific research, manufacturing processes, distribution systems and financing must be vigorously pursued by enterprises, and supported by public authorities."[692] In fact, concentration does continue during this decade, with SMS in 1963 being formed by the merger of UCPMI and Knutange. Wendel-Sidelor, in turn, is created in 1968 by fusing SMS, de Wendel SA, and Sidelor; Usinor expands in 1966 by consolidating with Lorraine-Escart. Further mergers take place from this point on.[693]

In a significant way, the direct link made between productivity and industry consolidation, and the fact that it was achieved, illustrates the power of a concept, or a discourse, per se, to exert real, organizing effects in an economy. Without expressing the need to step up productivity in line with the United States (or to create a concentrated steel industry comparable to that in the US, UK and Germany), or – more plainly – without the call to increase productivity to ensure the survival of the state, it is hard to see how such effects could have come about; this is the counterfactual to be posed. The counterargument would suggest that industry concentration was inevitable as a means to achieve production efficiency. If this were so, why would French officials compare their strategies with those across the Atlantic, where the steel industry was comparatively concentrated? Sheahan claims that the French steel industry was as little concentrated following the war as it was during the late 1800s.[694] Something moved French industry. Economic theorists during this time period suggested that optimal (efficient) firm size and industry concentration are functions

[690] France (1963), *Commissariat Général du Plan d'Equipment and de la Productivité, Quatrième Plan de Développement Economique et Social, 1962-1965, Journal Officiel de la République Française,* Paris: *Imprimerie (111, rue du Mont-Cenis),* pp. 11-12
[691] Ibid., p. 12
[692] Ibid., p. 12
[693] Freyssenet and Imbert (1975). pp. 7-9
[694] Sheahan (1963), p. 66

of production cost minimization.[695] Were rational economic actors moving the economy towards efficient solutions on their own, policy would not be necessary. Policy, at this time in France, was heavily legitimized by repeated appeals to boost productivity. And the benchmark was simply *in comparison to* other countries.

What do the data say? Sheahan analyzes two data sets looking at productivity improvements, defined as output per man-hour, noting a general correlation between productivity improvements and rates of growth. Numbers for the steel industry alone are not available in this data series, but for the primary metals group as a whole, production achieved a level of 147 in 1959, using 1954 as a base year (= 100), while output per man hour rose to 134, referencing the same base year. [696] Noting the differences between the way in which French and US data are processed, the author presents comparisons between the two countries' production and labor productivity levels, again in 1959, using 1954 as a base year. In primary metals the French to American production ratio figures at 134, the labor productivity ratio, at 118[697] – numbers that appear dubious at best. Why would the *level* of French labor productivity be higher than that in the US by such as wide margin?[698] Is production relative to another measure? It is not clear by what, if at all, output (value) is deflated. We cannot know the influence of pricing, or government contributions to industrial growth. Clearly, gains from concentrating the steel industry could have resulted in higher labor productivity (or higher growth rates of productivity) if there were economies of scale to be achieved; productivity figures could also have soared more from stepped-up capacity utilization than increases in "efficiency," per se. But the arguments are unimportant in term of their influence on policy: even if the numbers hide more than they reveal, they serve to legitimize the action that was taken.[699]

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[695] See, for example, George J. Stigler (October 1958), "The economies of scale," *Journal of Law and Economics,* 1, pp. 54-71 and Joe S. Bain (March 1954), "Economies of scale, concentration, and the condition of entry in twenty manufacturing industries," *The American Economic Review,* 44:1, pp. 15-39.
[696] Ibid., p. 143-144. The statistical series reproduced in this text comes from *Institut National de la Statistique et des Etudes Economiques* (1961), *Annuaire Statistique de la France, Rétrospectif,* Edition 1961, Paris, pp. 325-333.
[697] US data are taken from the Board of Governors of the Federal Reserve system (1960), *Industrial Production, 1959 Revision,* Washington DC and from the US Department of Labor, *Monthly Labor Review* (date not indicated).
[698] The validity of making absolute-level comparisons is discussed later in the text on p. 202.
[699] In a report outlining objectives for the steel industry, output was projected to increase 137% from 1949 to 1952 – the estimated level needed to help France achieve self-sufficiency. See France (1950), p. 24

The spread of ideas through government missions

Study exchanges: the steel industry. The steel industry not only became more concentrated as a result of the drive for productivity growth; the way in which individual steel firms were organized changed as well. For example, an entire mission had been created – *Mission de Productivité de la Sidérurgie*[700] *Française* – to study the way in which the US steel industry was organized. A report by this mission following a study in the United States opens with the sentence, "Our vocabulary has been enriched since a few years by the word, "productivity."[701] In this introductory text it is claimed that France's productivity, overall, is roughly 3-4 times less that of the United States. At issue is whether the productivity lag is particularly problematic for a specific industry sector, such as steel. [702] As if the report writers could not, on their own, lend gravity to this question, the section begins with a quote from the French military theorist and writer, Ferdinand Foch: "*De quoi s'agit-il?"*[703]

It is about comparing French and US productivity levels in the steel industry and trying to discern the "cause" of American productivity. The French steel mission[704] is careful to state the problems intrinsic to productivity comparisons across countries, notably, that the different steel products are likely not being produced in equal proportions for both countries, which would make the aggregated figures unsuitable for productivity comparisons – for starters. With these cautionary words in mind, gross comparisons *are* made, using production of steel in tons per worker as the base calculation for productivity. In this statistical table, productivity, so defined, for the United States climbed from 134 in 1947 to 140 in 1950, while for France, the figures rose from 40 in 1947 to 54 in 1950.[705] The authors suggest that, whatever the margins of error, differences are too large to ignore. Clearly, the absolute levels of productivity are the focus of concern – the trend of productivity growth favors the French. But, absolute levels are difficult to compare across

[700] *Sidérurgie* translates to "iron and steel"
[701] France (1952), *Mission de la Sidérugie Française aux Etats-Unis, Contribution à l'etude de la productivité dans la sidérurgie française aux Etats-Unis, Février-Mars 1951, Paris: l'Imprimerie de la Fourche*, p. 11
[702] Ibid., p. 11
[703] "What is this about?" Ferdinand Foch (1851-1929), a general during World War I and later became Allied supreme commander in 1918. Ibid., p. 11
[704] Funding from the Marshall Plan supported these missions. Ibid., p. 13
[705] Ibid., p. 12

countries – how are the data aggregated?[706] It doesn't matter: gross differences in absolute levels legitimize the study and provide the gauge of competitiveness. But, in a sense, because an earlier study by the *Commissariat* suggests that iron and steel production in France reached only 50% of its capacity in 1938,[707] it can be assumed that part of the productivity increase is due to heightened capacity utilization (and/or a "catch-up" element often attributed to high growth rates) which doesn't translate automatically into a raw notion of "productivity" – or the putative key to long-term growth. What the mission appears to be assuming is that the attainment of absolute productivity levels, comparable to those found in the US, are due to factors other than capacity utilization (and in addition to firm concentration). Productivity, according to this study, is associated with "efficacy," or the means to produce the same quantity with less labor – efficacy will translate into a higher standard of living, not higher levels of unemployment.[708] Whatever the cause of higher efficiencies, it is clearly international competition that drives the effort forward.

Study exchanges: work organization and attitudes. The first chapter of the study, entitled, "American management ideas," attempts to "understand Americans," in order to discern the ways American think about productivity – the claim is that productivity is first and foremost a "mentality."[709] The study authors sum the American mentality as embracing (1) individual liberty (2) confidence (3) indefinite progress, owing to the human spirit and (4) equal opportunity and the legitimacy of a profit motive. The section begins ethnographically, with the study commission depicting easily friendly Americans, and then views competition in American through the analogy of an American football game: you begin the fight with equal chances, then the winning team reaches out its hand to those who lost the fight. This is called, "the American Spirit."[710] From this musing, the authors attempt to discern what, exactly, is at the base of the gap between the French and US productivity levels in the iron and steel industry. Is it because American industry is free? The authors point out that French dirigisme was accidental; it was not a principle – it was

[706] In an earlier study by the Commissariat, *cast* steel production in 1946 is estimated at 12 million tons (France, 1952), p. 31; in this study (France 1952, p. 12), total steel production is set at less than half this amount (5.7 million tons) in 1947. Workers include all factory personnel – those paid by hour and salaried employees; hence, the difficulty of drawing comparisons.
[707] France (November 1946), p. 32
[708] France (1952), pp. 12-13.
[709] Ibid., p. 19
[710] Ibid., pp. 20-21

imposed out of necessity.[711] This group then states that the American iron and steel industry, by contrast to that in France, is free to define its own goals (as shown by firms' new extension targets posted in annual reports) and to develop (as shown by the reinvestment of profits).[712] The study authors then consider the possibility that the US iron and steel industry might, in some sense, be coordinated or subject to the guidance of the National Production Authority[713] but conclude that the intervention must be less orchestrated.[714]

Why is this discussion important to note? It shows, first, how broad the presumed causes of productivity growth are believed to be: in this case, the study authors are unwittingly presaging the varieties of capitalism literature by wondering to what extent institutional structures, in addition to "mentality," may influence outcome. Second, it demonstrates a kind of raw curiosity about how the American economy is organized – ideas float across the Atlantic, both ways, and they leave their trace throughout the century.[715] Both sides, it seems, are looking to find the way in which to build, in Truman's words, "an effective team" between private enterprise and government. Analyzing the way in measures are undertaken to promote productivity in both countries provides a way to trace this exchange and its effects. In this case, looking for either more centralized planning in the US economy, or less centralized planning in the French economy would provide evidence of one such exchange. Still, it seems clear that the lion's share of ideas is streaming from the US to France, from the liberator to the liberated.

Do American optimism and pragmatism contribute to productivity? The French study authors, at that time, believed so, and underscore their conviction by serving up a quote by Virgil to begin this section: *Audentes*

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[711] The extent to which dirigisme actually contributes to the organization of the French economy has been long discussed. When describing the French economy during the early 19th century, Woolf speculates that, "It seems possible that there was a similar sense of a shared ideology about the methods and possibilities of developing industry, which combined *dirigisme* with the underlying liberal vision of the economy; the state's role remained that of the guide, whether through statistics as a means of identifying the most profitable sectors to develop or as provider of capital for new industries, but the ultimate mechanism remained that of private entrepreneurship." Woolf (1984)
[712] Ibid., p. 22
[713] The National Production Authority was created in 1950 under the Defense Production Act. In fact, although the steel industry resisted government pressure to increase production following the end of the war, Prechel (1990) claims that the industry began responding to pressure under the Defense Production Act, with capacity expanding from 109 tons in 1952 to 149 tons in 1960 and government financing 45-60 percent of the investment.
[714] France (1952), pp. 22-23
[715] John F. Kennedy reportedly expressed interest in the French planning system during his presidential term.

fortuna juvat.[716] The optimism in America, according to the study group, is evident in their belief that expansion is unlimited, that competition can threaten them at any time, which is why they insist that they can always do better tomorrow.[717] With particular regard to the iron and steel industry, the study team suggests that the Americans know how to dare, to push their blast furnaces to produce 1,500 tons per day, whereas in France, progress is kept at bay through an attitude of "necessity."[718] Americans want more. For example, in France annual steel consumption (kilogram per inhabitant) is shown to have reached a level of 120 in 1930 and climbed to 180 in 1948; in the United States, the corresponding figures are 270 and 530 – or twice the increase in per capita consumption. The higher level of production is, according to this study, what prevents the Americans from fearing "technological unemployment": with a high-producing economy responding to growing demand, workers become displaced by machines only temporarily.[719] Optimism, hence, fuels the "politics of more." To conclude the section on optimism, the French authors note how Americans love to play the role of coach – it is what they think they need in France: not to play the role of "extinguisher," but of "coach" – coach the population to be optimistic and push the production goal forward.[720]

From this specific example of the steel industry, the study authors extend American concepts to manufacturing processes, generally: specialization, for example, allows producers to compartmentalize the problem to be resolved; perfection comes tomorrow. According to the French study authors, it is this pragmatic attitude that underscores the American idea of unlimited progress.[721] The study claims that a change in the French education system – more towards practice and experience, less theory – could help the population learn this new "efficacious-minded" behavior.[722] Other more "ideational" elements singled out include an attitude on the part of French workers, that they "rent" their services, while the study team

[716] *Chance smiles on the bold*
[717] France (1952), p. 25
[718] Ibid., p. 25
[719] Ibid., p. 26
[720] Ibid., p. 27
[721] Ibid., p. 27
[722] Interestingly, the French authors make the point that "pragmatism" is learned, not an essence – a claim they demonstrate by arguing for the superiority of the metric system in terms of standardizing processes. The implicit message is that *even* the Americans can learn to be more pragmatic and efficient. Ibid., p. 27

claims they discerned more of a "participatory" attitude on the part of US workers.[723] Finally, in terms of organizational order, the French team appeared to be impressed by the clarity of responsibility lines and the transparency of tasks assigned – several organizational charts are sketched in the study, as example. The study team predicts that Fordism, and its promotion of centralization, will be replaced by what they see in these steel and iron companies: a delegation of responsibility by team, with each team director mandated to impart "efficiency principles" to their team members and each team member assigned a particular task.[724]

Finally, the authors conclude that the study was intended to help narrow the gap between the standard of living in France and the United States: productivity is the medium. Although it is conceded that capital investment is needed to accelerate equipment modernization and specialization – a longer-term process – other more ideational elements can begin to exert productive influence simply by altering work mentality and the way in which industry is organized.[725] The idea of productivity and how it is to be achieved is thusly imported wholesale from the United States.

The spread of ideas through individual initiatives: Pechiney SA and INSEAD

In a published case study on the French aluminum and chemicals concern, Pechiney SA, Ludovic Cailluet makes a compelling case for the influence of American management ideas on the organization of the company, though the role played by the Marshall Plan in bringing about this outcome is downplayed.[726] The Marshall Plan's "productivity drive" as an organizing force is questioned simply because the early company history had long been peppered by the influence of American ideas – particularly by *The Principles of Scientific Management*[727] – which suggests that exchanges were not in need of a formal institutional frame to take place.[728] The argument does not detract from the hypothesis that the *idea* of

[723] Ibid., p. 28
[724] Ibid., pp. 147-148 and p. 158.
[725] Ibid., pp. 179-180
[726] Ludovic Cailluet, "Selective adaptation of American management models: the long-term relationship of Pechiney with the United States," in Matthias Kipping and Ove Bjarner , eds. (1998), *The Americanisation of European Business: the Marshall Plan and the transfer of US management models,"*London: Routledge, pp. 190-207.
[727] Frederick W. Taylor published *Principles of Scientific Management,* in 1911. The influential monograph is devoted to a study of "workflows" and labor productivity.
[728] The company is said to have engaged many outside experts during the 1930s, many of which adhered to the principles of Taylorism. Ibid., p. 191

productivity motivated theses exchanges and exerted organizing effects – the degree to which the Marshall Plan helped these exchanges to continue is immaterial – it can be inferred that the plan helped build the institutional frames that ultimately *facilitated* exchanges.[729] The case of Pechiney SA illustrates such an exchange and the role played by the productivity discourse in its initiation during this time.

Following the war, for example, Pechiney's chief executive, Raoul de Vitry, attempted to rationalize office organization and enlisted a long-time "productivity expert" expert at the firm, Jean Benoit, who had held contacts with American experts before the war. Benoit is said to have proposed a new organizational chart based on "process" departments in an effort to enhance efficiency.[730] In order to carry out the rationalization further, the company sought an outside consultant, K.B. White. Why an American? Cailluet claims, "…the Allied victory was mainly a victory of American industry and the scientific management methods it employed. Americans were seen as the advanced organisers of their time, and many French people were impressed by direct testimonies of their military efficiency."[731] White and his consultancy, K.B. White and Co., began a long series of interviews with plant engineers and plant managers to determine the best organizational structure, as well as to enlist their political support, according to Cailluet. White then set up a system of intra-firm communication, a model, reportedly, that many French firms subsequently adopted. A key point in White's recommendation was to decentralize management, conferring greater responsibility to individuals through the detailing of specific objectives and budgetary limits – *interestingly*, this organizational model falls very much in line with that presented as an example by the iron and steel mission sent to the US to study organizational models. According to Cailluet, and in line with a shift from Taylorism to a more Fordist organizational approach, the "White model" looked at the company as a whole, combining corporate restructuring with work simplification, and going beyond the

[729] More important to the understanding of the power of discourse is the fact that productivity concerns drove the passage of the Marshall Plan. The power of the productivity discourse to help pass the Marshall Plan authorization bill is discussed in the US section. But it is interesting to note here briefly that passage was not a given and needed a legitimizing concept – like productivity – to counter opposition to the plan.
[730] Ibid., pp. 197-198
[731] Ibid., p. 198

"shop floor."[732] The exchanges continued, some of which, were sponsored as Marshall Plan mission, much like the iron and steel industry study mission:

> As early as 1945, and with increasing frequency from 1950, engineers and executives of the company traveled to the United States, a minority of them through the productivity programme. Two of those who visited the United States as 'missionaries of the Marshall Plan' in 1950 were the engineers J.C. Hornus and G. Yelnik. They were deeply impressed by what they saw and learned in the USA. Subsequently, J.C. Hornus implemented some of the practices he had studied at Pechiney's American competitors when he became chief engineer of the company's manufacturing subsidiary Cédédur in the late 1950s. In the same period, G. Yelnik was promoted head of industrial relations in the aluminium department and developed extensive worker training programmes, again inspired by American experience. Similarly, Max Duval, later to become secretary general at Pechiney, made a detailed survey of public relations practices in US companies, especially at General Electric. The survey was used as the basis for the creation of such a service at Pechiney in the following years.[733]

Why does this matter? This excerpt, based from company archives, clearly shows the transfer of ideas, through the initiative of individual agency. It demonstrates, rather forcefully, the virtual contagion of ideas, and for this particular point in history, the direction of the exchange is undoubtedly determined by a particular and extraordinary convergence of circumstance: an economy, whose development was interrupted by war, benefiting from the aid of a flourishing power, whose victory in the war seeded prestige and intrigue. The goal of the exchanges, no matter if they were sponsored by the Marshall Plan or not, was to enhance productivity in the workplace – it was an apolitical objective, or pitched as such – meant to benefit the collective whole. Certainly, the ideas imported from the US became translated differently when applied in French culture. But, the fact that an organizational chart can transfer ideas so quickly is noteworthy on its own, for it shows how easily ideas can shift and produce re-organizing effects.

Does this one outcome implicate productivity as a moving *force* in the economy? It does. If authoritative organizations suggest that more can be had from less, simply by training personnel and reorganizing production processes, it is hard to imagine what might block the transfer of ideas. Did a sense of French national identity thwart the spread of new management ideas? That hypothesis does not hold water in light of the major institutional moves, supported by the French government, to import American management ideas. Indeed, the founding of INSEAD in 1957, helped in part by Pechiney's chief executive Raoul de

[732] Ibid., p. 201
[733] Ibid., pp. 202-203

Vitry,[734] provides evidence for the claim that neither identity nor institutional structures produce insurmountable barriers to the diffusion of ideas. According to business scholar Guiliana Gemelli, for example, French industry and university institutions – *les grandes écoles* – had both been antithetical to the founding of INSEAD. But the founding of INSEAD by Georges Doriot[735] helped navigate ways around these obstacles, largely by looking for funding outside the university system and seeking support directly from the business communities in both France and the United States.[736] In this way, an institutional channel, serving to directly funnel management ideas into France (and Europe, more broadly) was seeded and established, by the ideas of individuals. The point delivered is that ideas develop institutions, and institutions develop in relation to dominating discourses.

Institutional empowerment and the spread of discourse

The planning commissariat. Originally a separate body, the Productivity Commissariat in France was joined together with the general planning commission in 1959.[737] The full name of the modernization plans then became *Commissariat Général du Plan d'Equipment et de la Productivité.* In fact, institutional support for the development of productivity in France was complex and elaborate, with different bodies being broadly subsumed under the *Centre Français de Productivité*. According to a document produced by the *Commissariat Général du Plan d'Equipment et de la Productivité* in 1963, the following organizations comprise the most important components of this vast network: (1) *Comité National de la Productivité*, founded in 1950 (modified by decree in 1954) and includes consultative bodies comprising representatives from technical ministries, employers organizations, agriculture and employee unions; (2) *La Service de la Productivité du Commissariat Général du Plan d'Equipement et de la Productivité,* a select committee mandated ensure the design, execution and coordination of all regional and national plans for all matters related to productivity; (3) *L'Association Française pour l'Accroissement de la Productivité (AFAP)*, a for-profit citizens group, representing different employers and employee groups, which intervenes as an

[734] Ibid.,, p. 203
[735] Georges Doriot (1899-1987) was a Frenchman, who earned an MBA at Harvard Business School, becoming its Vice-Dean at the age of 28. He later became a US citizen. See Giuliana Gemelli, "American influence on European management Education: the role of the Ford Foundation," in Rolv Petter Amdam (1996), *Management, Education and Competitiveness: Europe, Japan and the United States,* London: Routledge, p. 43
[736] Ibid., p. 61
[737] France (1963), p. 54

executive body as defined by public authorities and the *Comité National*; and (4) a series of private bodies aided in terms of technical and financial matters by the *Service de la Productivité* and AFAP.[738] In addition to these more general organizations and consultative bodies, many industry-specific associations began to be formed during this time.[739] The associations often sought to install a "productivity framework," helped with subsidies from the *Centre Française de Productivité.* The extent of industry participation at the time of this report is mixed, with 80% of cotton manufacturers belonging to the association, but only 10% for the hand tool industry.[740] Taken, together, the network of centers and the general consultative bodies indicate clearly a mechanism through which the productivity discourse could be seeded throughout French industry.

The socialization and institutionalization of productivity measures. The power of statistical measures to trigger policy action, discussed in chapter 3, is clearly evident in the French planning system. In the first modernization plan, for example, the commission states the purpose of statistics very clearly: "In all advanced countries, whatever their economic system, in the United States as well as in the USSR, statistics are the basis of all government action."[741] And, government action needs a basis of comparison in order to gain credibility: in a mid-1940s French statistical manual, industrial production per man-hour from 1900 to 1930 is compared between France, the United States and "the world." The graph shown does not explain how industrial production is measured, and perhaps this is why the authors caution that the figures should be interpreted as trends, and not absolute figures. The chart shows France to be at the same level in productivity as the United States and the "world" (whatever countries the "world" comprised at that time – it is not specified in the text), with the trend decelerating from 1911, when threats about a world war were beginning to be felt. The trend accelerates again at 1920, but the interim years of decelerating productivity growth was seen to leave France behind in an absolute sense.[742] Even today, according to sources at BLS,

[738] Ibid., Introduction
[739] The first to form was the General Foundry Association in 1951. Ibid., p. 53.
[740] Ibid., p. 55
[741] France (November 1946 –January 1947), *Commissariat Général du Plan de Modernisation et d'Equipment,* General Report on the First Plan of Modernization and Equipment, Paris: Ramlot et Cie, p. 106
[742] France (March 1946), Commissariat Général au Plan de Modernisation et d'Equipement, *Données statistiques sur la situation de la France au début de 1946 (rassembleés en vue des négociations de Washington),* Paris: Imprimerie Nationale, p. 12

international comparisons are considered valid only at the level of trend analysis (i.e., not absolute levels) over long periods of time.[743] Clearly, though, for policy purposes, this caveat becomes easily lost: in the graph produced in 1946, the slope of industrial productivity between the United States and France appears nearly equal; however, what is discussed in policy papers, is not the trend, but the noted difference between the absolute levels[744] – exactly what is indicated to be incomparable. But the numbers do their work: they summon action in the name of productivity growth.

Numbers legitimized policy throughout the plans, and productivity numbers are particularly "productive," helping to cover labor issues as well as growth. In *Actions de Productivité,* at the beginning of the chapter entitled, "Social and human aspects of a productivity politic," it is asserted that, "A productivity politic exerts a direct influence on the life of a worker, first, because it sets in motion human capacity, whose results contribute to the growth of national wealth, through which the purchasing power of employees is increased." The text then goes on to describe how workers ascribe readily to the notion of productivity, not only because they will benefit from productivity gains, but also because it will grant them a greater desire to participate in guiding economic existence, which – through the use of reason, scientific progress and natural resources – will profoundly transform the human condition.[745] Productivity is a vehicle through which costless material benefit is created. The audience for whom this pitch is intended is clear: it is for workers to understand their responsibility in growing the economy. All workers need to be on board, unified towards a collective goal. And, a committee was created to help carry out the task: *Délégation Générale à la Promotion Sociale* (through the *Centre Français de Productivité*).[746]

These different consultative bodies served as links to the government, as well as a means through which to spread productivity practices. In *Actions de Productivité,* it is noted that firms receiving financial aid to

[743] In an e-mail exchange with BLS economist, Aaron Cobet, from the International Labor Comparisons Program, 5/20/2010.
[744] See, for example, the reference cited in footnote no. 698.
[745] Ibid., p. 105
[746] Numerous additional bodies were created to help instruct workers, producers and consumers about productivity and production processes, including the *Centre Confédéral d'Education Ouvrière et de Formation des Militants de la CGT-FO, l'Institut Confédéral d'Etudes et de Fomation Syndicale de la CFTC, Centre Economique et Social de Perfectionnement des Cadres, Le Centre Intersyndical d'Etudes de Recherches de Productivité, Organisation Générale des Consummateurs.* Ibid., pp. 106-109

modernize their plants must also, in parallel, undertake measures to help spread the benefits thereby achieved to workers. For example, since 1955, fiscal and social exemptions were accorded to firms, which had signed incentive agreements between employers and union representatives spelled out in legislative decrees.[747] The *Centre Français de Productivité* also promoted ideas about productivity by sending young trade union members to the United States to learn more about productivity and its "mechanism of action."[748] This section of the *Actions* concludes with a cautionary note that workers will participate in the process of generating higher productivity levels only when they better understand the evolution of technological effects *and their measurement*.

Productivity statistics figured centrally in the government's effort to present the results of the modernization efforts. For example, the *Centre Français de Productivité* created the *Groupe d'Etudes et de Mesures de la Productivité* in 1960 to study all issues relevant to the measurement of productivity. Measures are considered necessary in order to: conduct economic planning, determine the level of employment, explore possibilities to reduce work hours, estimate needed investment levels, and establish a wage policy based on productivity improvement.[749] Productivity measures, then, formed the basis of most important economic decisions. In the *Actions de Productivité,* a summary chart of productivity measures is presented. Productivity concepts are divided into three groups: physical productivity, speed of development and "economy of means."[750] Physical productivity refers to industrial branches producing one single product (or products that can, through "technical coefficients" be reduced to one product), measured in terms of physical units, such as weight, surface, and so forth, divided by "work," for which either man-hours or number of workers are used as proxies. For the speed of development, measures include national product plus imports divided by "work" (brute labor productivity). Final productivity is calculated as gross domestic product divided by "work," and net productivity is calculated as gross domestic product minus "amortization" divided by "work." All products are measured in constant prices to provide a "volume"

[747] Decree no. 55.994 (May 20, 1955) and decrees no. 55.1223 (September 17, 1955); these decrees were later repealed, though a January 7, 1959 ordinance, by extending exemption earnings to other incentive formulas encouraging productivity growth. Ibid., p. 110
[748] Ibid., p. 111. In this same work it is noted that special bodies were set up to study socio-psychological effects of automation, such as *l'Institut des Sciences du Travail*, Ibid., p. 118
[749] France (1963), pp. 9-10
[750] This latter concept really corresponds to "overall productivity," or total factor productivity.

estimate. "Global productivity" is calculated as gross product divided by the sum of work, purchases and amortization – which essentially measures the product in relation to factor costs (or a rough estimate, thereof).[751] The figures are aggregated and similar to those proposed in the United States – what is interesting is that a distinction is made between the measures and their different conceptions. Productivity is really limited to physical measures of a single product per unit of labor (either per worker, or per man-hour). The other values are getting at something different: development as measured in terms of aggregated product. In reality, the concepts are often lumped together; such illustrates the plasticity of the concept.

Curiously, under the national comparisons, the authors note that the values are "fictitious," because quantities for one country are weighted by prices from a different country. In a sense, weighting quantities in this way even within a country could be considered "fictitious" by similar reasoning: perhaps valuation differs from one time to another. Do borders make the valuation any different? Such issues reflect a kind of instability intrinsic to the discourse.

INSEE: the productivity discourse delivers a new mandate. The way in which industry production statistics became accepted in France adds further evidence to the hypothesis that the productivity discourse was powerful in its organizing ability and that ideas influence institutional configuration – and that change can be contingent. According to French historian Béatrice Touchelay, for example, the CNPF and INSEE were created[752] following the end of World War II to help shape a new modernization strategy.[753] But, it is interesting to note that the effort to collect industry statistics was not unchallenged. According to Touchelay, the *Poujadist*[754] movement – for one – persisted in its attacks on "American-style" modernization, of which statistical measures would be considered a key component; the author claims that

[751] Ibid., pp. 12-13
[752] Employers created CNPF and the French government established INSEE.
[753] The full names are *Conseil National du Patronat Français* (the National Council of French Employers) and *Institut National de la Statistique et des Etudes Economiques pour la Métropole et la France d'Outre-Mer* (National Institute of Statistics and Economic Studies for France and Overseas Territories), respectively. Béatrice Touchelay (April-June 2000), "*L'INSEE et le CNPF de 1946 à 1961:l'histoire d'une alliance modernisatrice," Le Mouvement Social,* 191, pp. 25-47
[754] Pierre Poujade (1920-2003) was a French politician. In 1953, he formed the conservative *Union de Defense Commercants et Artisans,* a group dedicated to the protection of small business in France.

this movement was successful in initially placing a break on efforts to gather a full industry census.[755] Industry itself was skeptical. Touchelay writes that the CNPF "deplored" efforts by INSEE to conduct an industry questionnaire in 1949, stamped by the Finance administration. But, the push to collaborate finally succeeded. How?

The way in which collaboration is detailed in this study provides a window through which to discern the raw workings of the increasingly powerful and potent productivity discourse. First, Touchelay claims that before the war the majority of producers refused to complete statistical inquiries; during the war, coercive methods were adopted.[756] If true, this would suggest that the eventual voluntary participation of industry in helping to complete a production census would amount to a break in the old discourse – or at least, indicative thereof, and the seeding of new discursive elements among industry. In 1948, INSEE uses an exhaustive list of all employers in France to begin a comprehensive campaign to reach the entire group and group the list by profession and geographical location – the posting of the list is welcomed by the CNPF, which the organization finds useful. The author claims that willing collaboration between the two organizations was greatly aided by the "productivity missions," with employers thereafter showing increasing support for statistical "tools."[757] By 1949 CNPF and INSEE express common concerns about insufficiencies in the data collected and the unevenness in terms of regional coverage. These concerns were intensified when those returning from productivity missions in the United States declared the institutionalization of statistics there to be "highly efficient." As published in the *Bulletin du CNPF* in 1950, a representative of the organization (Lebouleux) asserted that statistics were compatible with liberal economies because they facilitated improvements in production efficacy. The same representative then declared that the system functions well in the United States because of a "mutual trust" between the State and producers. Such charges are claimed to have pushed Emmanuel Mayolle, a once vice-president of CNPF, to reform the French system – later to be voted into law on June 7, 1951.[758]

[755] Ibid., pp. 25-26
[756] Ibid., p. 26
[757] Ibid., p. 32
[758] Ibid., pp. 34-35 and p. 37

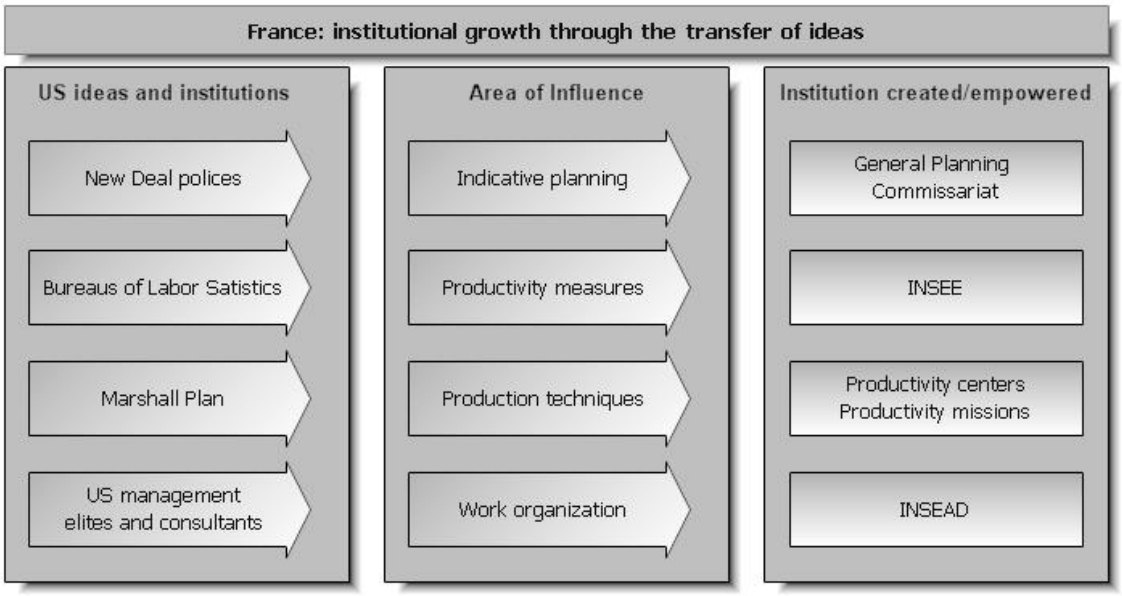
The *Poujadists* and popular press continued, however, to denounce statistics and their potential abuses and attempted in 1957 through a parliamentary group, *Union et Fraternité Française*, to repeal the 1951 reforms, but failed. The discourse was becoming more deeply implanted as employers became more involved with the effort, now successfully linked with economic expansion. Further pressure came from a study by the European Productivity Agency decrying the state of statistical documentation in France compared with other European countries, with less means at their disposal.[759] These "insufficiencies," according to Touchelay prompted the French government to provide INSEE with further resources still in 1961. By 1963 the first industrial census was carried out in France, allegedly owing to the perception that France lagged in statistical documentation compared to other countries.[760] By this time, the fourth plan had already been launched, and in this plan, the plea for more exact and comprehensive production measures appears to have at least not impeded the outcome.[761]

These developments square with those occurring in other areas of the French economy around this time. Like the concentration of the steel industry, which followed the call for productivity and lent urgency by the assessment that the French lagged the US in this particular regard, statistical production measures became institutionalized in France and accepted as a vital link to economic growth: the French pushed for reform in the face of competition from other countries. Clearly, alternatives were available, as represented by the *Poujadist* movement and the popular press; the French were wary of state intrusion, as reflected in the gathering of statistical data. It is somewhat ironic that the French elite, more used to a centralized system of governance, lost no time in using the liberal economy of the US to help legitimize a shift in how information would be shared. This example severely weakens the argument that institutional structures somehow direct outcomes. They may influence outcomes. But in this case, the way in which centralized information had to be developed strongly suggests that discourse and the exchange of ideas from other countries represent more potent organizing forces in the economy than institutions, as raw power structures.

[759] pp. 41-42 and pp. 45-46
[760] Ibid., pp. 46-47
[761] See discussion of this topic from the fourth plan on p. 211.

Figure 6.2 provides a broad-brush illustration of the way in which ideas influenced institutional growth and reconfiguration during the early postwar years in France.

Figure 6.2



Shifts in the discourse

The fourth plan, 1962-1965: is productivity delivering? The fourth modernization plan was signed into law on August 4, 1962,[762] passed by both the National Assembly and the Senate; unlike the earlier plans, the fourth plan was intensely debated in the parliament,[763] which provides an open view into how these plans were assessed by different political interests. The plan opens with a declaration of the climb in production over time, citing a 4.5% annual increase per capita in France over the past ten years. This rate, the commission reports, is directly linked to the country's effort to boost productivity – the growth level places France next to Italy and Germany and far ahead of the United States and Great Britain.[764] Even though the legitimacy of the comparison can be doubted – national accounting systems were not perfectly synchronized at that time, nor are they today – the claim is *legitimizing* in that it imputes growth to productivity. All early modernization plans in France pushed to increase productivity; now the results are in: it worked. But *how* did it work? The link between productivity and economic growth has never been completely understood, and *why* would the French be so far ahead in terms of growth compared to the Americans and Brits? In the text, the commissioners link their growth rate to a particular intensity of innovative effort, the rapidity of change, and scientific progress. It is reasonable to expect that higher production figures could still be traced to a "catch-up" factor, or a more intense effort to level the playing field. But, it is hard to buy the argument that France demonstrated higher productivity by innovative efforts that eclipsed the Americans and the Brits, for example. The French were beginning their efforts at a lower base and, essentially, adopting US ideas of production.

In this plan, like in earlier plans, commissioners are careful to parse the role between state and individual: the debate on dirigisme continues. The plan is not a directive or an obligation, they remark, but a way to include the participation of the total economic and social force that comprises a nation. The commissioners concede that planning is difficult for an open economy and one that faces unforeseen events, as all countries do. But, they continue, having a plan helps in such circumstances, because they can evaluate "contingency" in the context of long-range vision – an argument that will resurface in the eighth and ninth

[762] France (1963), p. III.
[763] The debate dates are listed in the plan document itself. Ibid., p. III.
[764] Ibid., p. 1

plans. In the fourth plan, this theme carries over to the plan objectives, both at the national and individual level. For the former, planning should promote state survival, solidarity, progress, and influence. For the individual, planning should promote better work conditions and a higher standard of living.[765] Increasing productivity can help accomplish these ends; in a sense, the productivity discourse is doubly potent in that it serves not only to legitimize policy – which it does in the US, as well – but is also legitimizes the planning apparatus. In the US, the discourse will serve to de-legitimize government intervention, and this difference is important to note. The productivity discourse has the power to serve both ends, precisely because the discourse is promising for the collective whole, but the way in which to achieve it, is elusive, or ambiguous.

In this discussion about the role of the state, the national priority of continued expansion precludes a shorter workweek. Diminished work hours remain a goal and a promise of the fourth plan, however. Indeed, the tone of this plan is perceptibly different from that of earlier plans in that concerns are expressed about "the consumer society," which the French believe to be promoted in the United States. In this plan, authorities write about the futility of blindly satisfying wants and the consequent malaise that follows. In order to balance these effects of mass production and consumption, the commission would like to ensure greater "equilibrium" among social groups.[766] It is hard to imagine how the push for productivity, whether in terms of investment or organization, would be diminished by this appeal – the issue really regards the extent to which the "fruits of productivity" are distributed among the French population. Does this matter in terms of the potency of the discourse? These developments are what the discourse promises. If a productivity agenda fails to deliver on its promise, does it break the discourse? If not, would this not suggest that the discourse is legitimizing – at a policy level – mostly because it is associated with competitive edge, and not so much with social prosperity and harmony?

In this plan, for example, production is predicted to rise by 4.5% per year. Agriculture is problematic. The commission suggests that the decline in the number of individuals in the agricultural sector will be more

[765] Ibid., pp. 3-5
[766] Ibid., p. 6

than compensated by an increase in productivity. In order that productivity does not create a surplus, which would exert a destabilizing effect on the French economy, producers will be encouraged to focus on products with highest demand. In fact, efforts in the fourth plan are targeted to develop new opportunities, enhance competitiveness (*presumably* trade balance), ensure equal development among agricultural regions and improve the standard of living for all, who are engaged in this sector.[767] This plan, it would seem, has shifted focus away from raw production to a "better" kind of production and greater social wellbeing. The question that needs to be investigated is whether this re-oriented discourse is truly producing new organizing effects in the economy, or whether it is intended to temper dissent, because the promise of productivity has not materialized for all social groups.

In fact, productivity remains a potent theme in the fourth plan. Chapter II of the plan, entitled, "Productivity," begins with the simple declaration that, "Productivity is sometimes considered to be an imprecise notion." But, the commission then summarily dismisses such indulgent musings by serving up the raw *fact*: domestic production in France has increased 67% from 1949 to 1960, while the population and the length of the workweek has remained, essentially, the same. [768] In what way did productivity cause this outcome? According to the commission, the source of productivity was diverse: the lion's share is attributed to tangible investments that resulted in a heightened use of modern techniques, as well as other more minor factors, such as work organization, work methods and so forth.[769] The growth rate is impressive, to be sure, but the link to productivity, elusive, or confounded by capacity issues. If the greatest source of productivity comes from investment, the increase in productivity is not free.[770] The investments are, for all intents and purposes, added inputs. It hardly matters, except for the fact that productivity is pitched, always, as generating something from nothing: more for less.

Three general objectives are listed in this chapter of the plan. First and foremost, the commission stresses the need to develop "exact" measures of productivity; this, to assuage the skeptics. These measures are

[767] Ibid., pp. 8-9
[768] Ibid., p. 169
[769] Ibid., p. 169
[770] Per Abramovitz' concept of "costless" total factor productivity growth – see chapter 4, p. 133.

needed at all levels – national, industry and firm – and can be used to support an abundance of policy objectives: economic growth, production and employment forecasts, evaluation of different factors of production, and price and wage policies. Importantly, these productivity statistics are also critically needed in order to gauge France's performance with that of other countries. These measures, the commission writes, provide the "objective diagnostic" needed to identify problems and remedying measures.[771] That the *notion* of productivity is providing the vehicle through which the French are organizing the economy, and that productivity statistics will serve as the roadmap, could not be clearer.

Interestingly, the second objective stresses the need to privilege intellectual investments over material investments. The commissioners claim that the former can achieve better results at less cost. New techniques, methods, and structures of organization: these modalities are to spread through the diffusion of ideas and information, and they are to correspond better with modern economic life. Results are to square with economic growth, higher standard of living, full employment and social objectives. All organizations mandated to promote productivity are called to disseminate new organizational forms of production.[772]

Third and last, the commission highlights the need to draw as much advantage as possible from unremitting scientific and technical progress; this is what "conditions" productivity growth.[773] The commission continues that productivity growth, in turn, influences nearly every important aspect of society, the ultimate consequences of which are not yet known. For example, at the time of writing in 1963, the French authorities express amazement over automation and the considerable levels of productivity thereby attained so as to render traditional productivity measures "meaningless." Productivity, in a sense, is carrying the country – with great promises – into uncharted territory, for which the past serves as no reference.[774] The commission urges that the evolution of automation in other countries be studied, to better understand its economic and psycho-sociological effects.[775] In conclusion, the commission notes that the most informed

[771] Ibid., pp. 169-170
[772] Ibid., pp. 170-171
[773] Ibid., pp. 170-171
[774] This sentence is interesting in the way it nearly foreshadows the difficulty statisticians will encounter throughout the remainder of the century, when technological changes occurs in leaps and steps, not progressively.
[775] Ibid., p. 171-172

entrepreneurs, management, farmers, academics, and unionists have *all* worked to adapt the French economy to the modern world through new initiatives in the name of productivity.[776] The commission presses for the continuation of efforts.

The commission then proposes a series of actions, most of which are linked either to education initiatives or the diffusion of information and ideas, as they relate to productivity. Gathering more accurate data to improve statistical measures counts as one priority. The commission is also concerned to spread information about the *results* of productivity-enhancing initiatives; this, because too large a section of the French population still adheres to outdated methods and structures.[777] Finally, the commission urges that productivity policies be carried out at all levels in the economy: firm, profession and region. At each of these levels, *an exchange of ideas* and experience are considered to be the most direct route to enhanced productivity. Productivity centers are to devote themselves to broader themes that impinge on productivity: concentration, organization of commercial services, specialization, structure and size of firms, product studies, simplification, standardization, and more, including economic forecasts and the diffusion of manufacturing guides.[778] If organizing effects were more linked to institutional structures, or other material constraints, why would the commission place so much emphasis on the spread of information and ideas? Because that is what works: the successful implementation of the 1963 industry consensus in France[779] supports the claim that practices, once unpopular, can shift through rhetorical powers and ideas that slowly begin to seed themselves and later resonate with those empowered to carry out the ideas.

The fourth plan and parliament: legitimization and contestation. Parliament may have played no substantial role in the approval of the first or third plan,[780] but public debates covering the fourth plan were extensive and revealing. The debates took place between May 22 and June 22 1962, with 110 speakers participating in the debates.[781] By this time, the language of productivity had clearly become widely

[776] Ibid., p. 172
[777] Ibid., p. 175
[778] Ibid., p. 177
[779] See section on institutionalization, beginning on p. 202, for an overview of productivity centers.
[780] See p. 182for a discussion of the minor role played by the parliament for the second plan.
[781] Hackett and Hackett (1963), p. 192

disseminated in the French economy. The modernization plans reveal the extent to which the concept of productivity was used to generate organizing effects of the economy: industries, such as iron and steel, began to concentrate; French companies adopted American management practices; institutional bodies worked to collect production data; education and training programs were established, at all levels, including the founding of a graduate institute, such as INSEAD. These effects represent what "worked" through the productivity discourse. Public debates,[782] by contrast, tend to reveal what did not materialize as promised, and for whom.

On May 23, 1962, Henri Fréville,[783] spokesperson for the committee on cultural, family and social affairs, opened the debates with a discussion about the distribution of national income. Fréville explains that national income is projected to increase by 64 billion French Francs (FF), with investment's share planned to increase from 20 to 22 percent; consumption by 43 billion FF; economic facilities by 10 billion FF; social facilities by 6.5 billion FF; with the remainder going to administration. According to the spokesperson, the cumulative increase in productivity had been estimated at 5.5%. How this rate contributes to the increase in national income is not indicated (nor how this rate was calculated), but it is linked to the fact that consumption will claim 67% of national income in 1965 – an amount that is unsustainable with monetary stability and the amount of investment needed to maintain proper productivity rates. In order to frustrate this result, Fréville argues that it is morally and politically imperative that policies favoring the underprivileged be initiated.[784] In this case, productivity levels must be maintained to ensure the wealth of the nation, but the way in which the wealth is distributed will affect economic stability. The productivity discourse was potent precisely because it promised more for everyone, at no extra cost. In these debates, that promise is queried. Now, it nearly appears as though social justice must

[782] Debates only from the French National Assembly are here considered. National Assembly members are directly voted into power, in contrast to Senate members. Moreover, the National Assembly wields more extensive powers than the Senate: when there is no agreement between the two governing bodies, the ultimate decision falls to the National Assembly. Per a 2009 discussion with Ms. Nicole Atwill, Senior Foreign Law Specialist, the Library of Congress, Washington DC.
[783] Henri Fréville was a history professor and member of parliament (1958-1968), as well as a member of the Senate (1971-1980). He was a member of various centrist parties (such as the *Centre Démocratique* from 1962-1967). For all biographical information regarding national assembly members, see: www.assemblee-nationale.fr
[784] France (May 24 1662 [sic]), *Journal Officiel de la République Française, Débats Parlementaires, Assemblée National, Séance du Mercredi 23 Mai 1962*, no. 33, p. 1262

first be delivered in order to ensure that productivity rates continue to rise – a rather interesting reversal in the causal arrow. Either way, the concept plays a critical role in how policy makers assess economic strategies. It can be inferred from the fact that the discourse is beginning to shift, from "produce at all costs," to now, "produce but with social equity in mind," that touted collective benefits of productivity growth have not been satisfactorily distributed.

Fréville revisits the issue of *social distribution* in subsequent remarks. For example, he suggests that industry concentration – presumed to deliver productivity gains – has limits. The spokesperson then remarks that the first three plans were dedicated to production, but the fourth plan switches focus to consumption, or rightly, he believes, to standards of living: *how* are people living in France? Has accelerated production improved the lives of all social groups? Already, at this early juncture, the discussion turns to the portion of the population predicted to be over 65 in 1980 and ready to retire. Are sufficient funds being placed aside to support a growing proportion of elderly in the population? The fear is that France will consume the fruits of its labor. Similarly, the "problem of automation," concerns the way in which work is parceled out, weekly and, in fact, throughout the course of life. These are issues that must be resolved at a policy level, not through the market. With production, come decisions. With decisions, come politics.

More fundamentally, what has thus far transpired, at the social level, has produced disappointing results, according to Fréville. For example, new housing has lagged need and does not seem capable of satisfying the projection in twenty years of 15-17 million new households, even if the planned increase of 350,000 new accommodations per year were to be built. The situation is rendered dire by the fact that rural dwellings were typically crowded – much of the housing stock, generally, in France is considered to be dilapidated and beyond repair. The spokesperson paints these circumstances to challenge the fourth plan's optimistic outlook signaling the "imminent end of shortages." Failure is not linked to the politics of

productivity, but to the inability of (centralized) authorities to properly distribute the wealth produced, or promised investment credits.[785]

Shortages, thus, do not de-legitimize productivity as a source of economic growth; shortages here described de-legitimize constraining institutional structures. But, the issue is not so much whether the French economy became "more productive" after the launch of the first modernization plans. The issue is that the "idea of productivity," largely imported from the United States *at that time*, legitimized the goal of producing more. Consumerism in this debate is being queried. Was wanting more inevitable? More is relative to what someone else has – in this case, other countries. But even if we were predestined to want more, the way in which productivity was to be achieved and how, in what manner, it contributes to economic growth has never been fully evident. The ambiguity produces latitude for policy passage. Even the way in which *the idea of* social disequilibrium is used in this debate to suggest it can threaten productivity levels illustrates, again, the power of this concept to endorse action: here, redistribution.

Fréville believes the solution to lie in defining a national income politic. More statistics are needed to understand to what extent "real" salaries are increasing over time in different economic sectors. But even with good numbers at hand, Fréville wants to debate how productivity gains should be distributed, as several options are possible: uniform wage increases; wage increases based from productivity differentials; price reductions; or a general redistribution of wealth through fiscal policy.[786] Here, the apolitical pitch for productivity loses resonance – certainly, smack in the middle of the *Trente Glorieuse,*[787] productivity appeared to have delivered. It had delivered growth. But the debates make it clear that with growth, politics enter: not every group is benefiting to the same degree. Fréville charges that lower prices do not always follow high productivity, nor does compensation always correspond to the service rendered. Indeed, he goes on to remark that during periods of rapid expansion, inequalities among sectors and regions tend to

[785] Ibid., p. 1263
[786] Ibid., p. 1263
[787] *Trente Glorieuse* refers to the postwar rapid growth in France and other industrialized countries that continued until the mid-1970s.

widen.[788] The charge that productivity has not delivered for all, and that consumerism threatens future stability, represents key points of contestation.

It is curious that, during this debate, the appeal for better statistics is made repeatedly; policy makers need proper productivity statistics in order to gauge levels in different industry branches, and only then can coherent transfers be made.[789] The idea that productivity does not operate as an organizing principle autonomously is noteworthy. In this debate, for example, the spokesperson asserts that, even if wages in private industry reflect productivity levels, it is clear that such does not apply to the nationalized sector, where wages remain "rigid and sclerotic." This situation must be addressed immediately, with public sector employees being treated equally as privately employed individuals, lest the nation finds itself in worse difficulty.[790] Fréville remarks that the fourth plan is not called a "modernization and facilities plan," as previous plans, but an "economic and social development plan." He questions whether the new title is "optimistic."[791]

Fréville is followed by a second spokesperson for the committee on cultural, family and social affairs, Noël Chapuis,[792] with a similar message: the plan has not delivered the social services necessary for national equilibrium, and like his colleague, claims the fourth plan has been misnamed.[793] This spokesperson, too, believes that economic development should be pursued only in accordance with social aims. Chapuis is quick to quote from an English media source, stating that excellent results have been achieved with the French planning system through a "…mixture of coaxing and intellectual clout." Such references to how the planning process is perceived by other countries surface in these and later debates. The idea that countries were watching each other and measuring up against one another is important to note. The organization of 20th century economies was set for discussion – a kind of forum, at least, among industrialized economies. It would seem to suggest that ideas could shape structure.

[788] Ibid., pp. 1264-1265
[789] Ibid., p. 1265
[790] Ibid., p. 1265
[791] Ibid., p. 1265
[792] Noël Chapuis was a member of the National Assembly from 1958-1967 and was affiliated with various centrist parties.
[793] Ibid., p. 1269

If it is assumed that the new focus on social development represents a shift in the earlier discourse on productivity, whereby production totals were privileged, the question remains how successful this shift actually was. Did it succeed in challenging the postwar focus on raw productivity? Probably not. As one example, a third speaker on behalf of the same committee, Jean-Robert Debray[794] urged the Assembly to consider what *kind of man* did the plan want to serve? For Debray, an essential development for the "man of the future" would be a reduction in the number of work hours needed to earn his living – the 35 hour work week is reviled, according to Debray, by economists. It did not transpire.[795] Even were the workweek to diminish, Debray argues that meaning in life had to be linked to work and continuing education – not merely free time and consumption. But, here, the speaker says, the plan is deficient, both in terms of resources set aside for the task, as well as how the goal is articulated by the commission. Using Oppenheimer as a reference, Debray argues that the goal of preparing 10 million young Frenchmen to fulfill future economic needs, per the text of the plan, evades the need to "explore *meaning* and what man wants."[796] Such is a subtle challenge to the postwar discourse insofar as the productivity discourse is predicated on certitude and a meaning, essentially, of "more." The spokesperson is offering a competing discourse, but one that cannot yet challenge the dominating productivity discourse and the production of more. His challenge is more direct when he later charges that the plan has made no attempt to address the need to protect environmental balance in the face of increasingly "devouring" industrialization and "technocratic" economy, which includes deforestation and the destruction of eco-systems.[797] Like the 35-hour week, this allusion to environmental threats is a new, competing discourse that cannot quite seed itself against the drive for productivity and production, *at this time.*

[794] Robert Debray was a member of the National Assembly from 1958-1962 and was affiliated with the conservative party, *Indépendents et paysans d'action sociale*.
[795] Later in the speech. Debray suggested that a 25 to 30-hour workweek may be possible Ibid., p. 1274); in fact, the 35-hour workweek was not passed into law in France until 2000; it continued to be debated as late as 2008. See chapter 9 for a further discussion of a reduced workweek.
[796] Ibid., p. 1270
[797] Ibid., p. 1272

The president of the production and exchange committee, Maurice Lemaire,[798] follows Debray and begins by suggesting a plan is a "rate of expansion" – economic development conditions social and cultural movements, the major expression of man's destiny.[799] The plan must stay focused on increasing production and *country comparisons* must be the guide. In a telling section of his report, Lemaire states that the United States is commonly known to have attained the highest standard of living in the world, but that what is attained, is not sufficient: "The power of accelerating speed … the dynamism of an economy is more important for a nation's psychology than the standard of living at the moment, which already appears to be part of the past."[800] Lemaire then goes on to describe how in the Soviet Union, what used to be the Russian way of life later – erstwhile satisfactory to the Russian population – has now been bolstered by the hope that soon they will reach the same standard of living as in the United States.

America does not rest, according to Lemaire, and neither should France. Certainly, exports are projected to increase in France from 1959 to 1965 by 55%, but imports are forecast to climb even higher, by 137%. Lemaire claims that some sectors, such as iron and steel, are doing quite well, but others lag in competitiveness. Agriculture, as always, is singled out as problematic – only productivity can save the sector and equalize the farmer's economic and social standing with that of his industrial counterpart.[801] For inspiration, Lemaire quotes John F. Kennedy, who in a recent message to Congress rallied for a new political strategy in agriculture – one that will be acceptable to farmers, consumers and taxpayer, too. Lemarie wants to track this policy, not stated. But, it indicates, again, this continual glance across the Atlantic and to other countries in the common market, underscored by Lemaire's conclusion that whenever France increases its productivity, other countries such as Germany will do the same:[802] that is, there is no room for complacency.

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[798] Maurice Lemaire, a Gaullist, was a member of the National Assembly from 1951-1978; he held several ministerial posts during his political career.
[799] Ibid., p. 1274
[800] Ibid., p. 1274
[801] In fact, Lemaire's statement is at odds with a later statement suggesting that productivity cannot lift the standards of French farmers, as all sectors are increasing their productivity, with a play in relative prices that effect profits in both agriculture and industry.
[802] Ibid., p. 1275

As an example, Lemaire points out that even with "the atom," France must procure more sources of carbon, because the fact that the United States and the Soviet Union both have "the atom" is not preventing them from developing these sources. Italy has just signed an agreement with Tunisia, and France worries that soon an agreement will be reached with Algeria. What will France do? Accept American coal at "defiant" prices, far below European levels?[803] Such battle cries can either imply that the way in which France decided to promote productivity and expansion was inevitable – a mere function of competitive survival – or that economies did not self-create, but were shaped by elites with decision-making power, emulating what they discerned as operating principles in other countries. Farmers must be productive before they can attain standards of living comparable to their industrial counterparts. True? False: farmers can be subsidized. Or, farmers can find new markets for their products. Or, farmers can leave agriculture and go to sectors, where they can be "more productive" and hence better paid. The output of coal must expand continually. True? False: the fourth plan actually calls for a decrease in coal production from 57 million tons in 1960 to 53 million tons in 1965. [804] Alternative energy sources are available. Continual expansion may dent productivity levels, if there are diminishing returns to scale. Does higher productivity lead to higher wages or lower prices? No one knows; hence the effect on competitiveness is ambiguous. Lemaire suggests that France should follow America's example and build enormous shopping centers, open from 6:00 to 11:00 pm, in the suburbs, where they are likely to offer good deals and decongest the city center at the same time. Should they? Is it productive to spend time driving out to the suburbs and shop? Lemaire suggests that the rhythm of sales must correspond to the rhythm of "machines."[805] Must it? "More" is not an inevitable human wish, nor is productivity – were it definitively definable – necessarily the only path to more. More is a goal: the way in which more is to be produced results from a political decision. If not the later, why would there be policy? Why would the "meaning" of consumption be debated in parliament, if it were clear that everyone wanted more? The 1960s were years of relative prosperity for France – quite recovered from the immediate postwar years. Certainly, impending competition from other countries can spur action. But, first, populations had to have an idea that it is in their interest – they have to decide it is in

[803] Ibid., pp. 1275-1276
[804] Ibid., p. 1275
[805] Ibid., p. 1275

their interest – to re-organize their economies to achieve standards of living attained in other countries. That the politics of productivity and expansion occurred at the same time across the industrialized world makes competitive determinism – a linearly progressive movement – suspect.

Lemaire notes his surprise that the plan calls for 290,000 new immigrants in order to fulfill manpower needs, when automation, relevant to an increasing number of applications, could be developed instead. A machine, for example, consisting of standardized elements is less expensive than individual machine tools – the expense of the former pays off two, four or fifteen times more quickly. This example is used to express further wonder why France has not created a Ministry of Automation, as Khrushchev has. In fact, this leads Lemaire to announce that the Soviet Union has adopted ideas that will move the country forward and unexpectedly pose an economic threat to the "Occident" – a prediction Lemaire refers to as having been made by Professor Oules from the University of Lausanne. Why? Khrushchev had adopted a strategy of automation. In just a few years, the power of automation will transform the country into a competitive producer of heavy industry. Productivity, though, did not save the Soviet Union – or automation did not. Such also helps underscore the power of idea transfer – do what the other countries are doing – there was nothing intrinsic to automation that was essential to survival. It was a production choice, made at the expense of alternatives that could have organized economies in other ways.

The debates continue to the end of May and resume in June; themes repeat, and it is noteworthy that discontent was expressed across the political spectrum. On June 7, 1962,[806] for example, Eugène Claudius Petit[807] presses the point that, "everyone loves what costs," as a way of urging the commission to be bolder and ensure that "heavy" investment will be able to cover the promises made in the areas of urbanism, culture and housing. To promise a shorter workweek before 1965 is dismissed by Petit as imprudent.[808] This diatribe, delivered by a centrist, speaks to the idea that the promise of more for less is an empty

[806] France (June 1962), *Journal Officiel de la République Française, Débats Parlementaires, Assemblée National, Séance du Jeudi 7 Juin 1962*
[807] Eugène Claudius-Petit (1907-1989) was the Minister for Work and Social Security in 1954 and a member of the National Assembly from 1958 to 1962 and from 1967 to 1978. He was a member a various centrist parties (*Union Démocratique et Socialiste de la Résistance, Entente Démocratique, Union Centriste*, among others) and involved with high-profile urban development projects.
[808] Ibid., p. 1552-53.

promise: France wants more. A second speaker, Jacques Douzans,[809] warns that regions falling outside the "central spine" of the country, such as those located in the south-west region – Midi- Pyrénées and Languedoc – risk becoming atrophied without greater effort to connect them with economic centers. The region lacks big industry – most industries are family owned, according to Douzans, which condemns the youth in the region to unemployment, or under-employment.[810] Marie-Madeline Dienesch[811] follows and expresses her disappointment that, while France requires pedagogical reform, in the plan pedagogy is discussed only *in relation to productivity*, which she finds "significant." She delivers the rebuke, "… it shows that we attack problems at a fundamental level only per economic necessity – all other human and social needs appear to be less pressing."[812] Another parliamentarian, René Billères,[813] remarks that France lags in education spending as a percentage of national income (four percent), compared with that in the United States (six percent).[814] Parliamentarian René Cance[815] picks up the charge, deploring France's backwardness in education compared with the Soviet Union, where scientific researchers number 310,000 compared with France's 20,000 – and whereas France produces 9-10 engineers per 100,000 inhabitants, for Great Britain, the United States and the Soviet Union, the numbers are 24, 20 and 60 per 100,000, respectively. Numbers, unverified, once again serve purpose. Cance declares: France is not "the head of the pack," as claimed by the President of the Republic.[816] Cance delivers his final blow when he declares the government to oppose the education of the masses – too dangerous – for a society in need of specialized workers serving "monopolistic capitalism."[817] Productivity was to benefit the collective whole, but parties across the political spectrum challenge the claim. The economic expansion has been "inequitably"

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[809] Jacques Douzans (1914-1995) was a French civil servant and politician and a member of the National Assembly from 1958 to 1962 (*Entente Démocratique*) and from 1967 to 1973 (*Progrès et Démocratie Moderne*) – centrist to center-left parties.
[810] Ibid., 1554-1555
[811] Marie-Madeleine Dienesch (1914-1998) was a French politician and the first woman to preside as president of a parliamentary commission. She served in the National Assembly from 1945 to 1981 and was allied to various parties (*Mouvement Republican Populaire, Démocrat Christian, Rassemblement pour la République*) – centrist to center right parties.
[812] Ibid., p. 1557
[813] René Billères served in the French parliament from 1946-1983, and was the Minister of Education from 1956-1958. He was affiliated with various left political parties, such as the *Parti Répblicain, radical et Radical-Socialiste*.
[814] Ibid., p. 1564
[815] René Cance (1895-1982) served in the National Assembly from 1962-1967. The son of an *Ouvrier Sabotier,* he was a member of the left party (*Communiste*) and the secretary of *Friends of the Soviet Union*.
[816] Ibid., p. 1564
[817] Ibid., p. 1565

distributed, according to Jean-Louis Chazelle,[818] and that the fourth plan promises to do no better than past performance.[819] He concludes that a better balance must be achieved between "… the exigencies of expansion and productivity and … the necessary presence of the mother at home."[820]

During the second session on June 7, 1962, the debates continue and are opened by Michel Sy,[821] who quotes the French political commentator, André Siegfried,[822] "Only culture can save technology and with that, man."[823] For Sy, the question to be asked is what should astonish us the most: the superior knowledge of the specialist in his domain or, rather, his ignorance of other fields, even those that are close to his field of specialization.[824] This statement contests a core value of productivity – specialization – and infers that progress may need collaboration, or a rounder form of expertise. Implicitly, Sy is offering an alternative to "progress"; specialization severs the connection with culture. Parliamentarian René Cassagne[825] alleges that the plan has exacerbated inequalities. He cites the example of Aquitaine, with 500,000 inhabitants, having been "sacrificed" as a result of the plan, provided with "a couple of hectometers of highway," but no provisions included to enlarge waterways, and is now in danger of losing its largest industry, naval construction.[826] Cassagne identifies the major losers to be workers – to increase global income, 75,000 jobs in agriculture are to be eliminated each year, without compensation specified in the plan. More specifically, Cassagne believes that the politics of wages, prices and profits render the plan difficult to realize. The charge is classic: the benefits of productivity are not accruing to workers either in the form of higher wages or lower prices, and not even to more investments, but to higher capitalistic profits – the alleged politics of Michel Debré.[827]

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[818] Jean-Louis Chazelle (1911-?), member of the National Assembly from 1958 to 1962, representing a centrist party (*Républicains Populaire et Centre Démocratique.*
[819] Ibid., p. 1567
[820] Ibid., p. 1570
[821] Michel Sy (1930 -?) was a member of the National Assembly from 1960 -1962 and represented the right party, *Indépendents et Paysans d'Action Sociale.*
[822] André Siegfried (1875-1959) was a French political writer and commentator.
[823] Ibid., p. 1571
[824] Ibid., p. 1571
[825] René Cassagne (1913-1968) served non-communist left parties (*Socialiste* and *Fédération de la Gauche Démocrate et Socialiste*) in the National Assembly (1958-1968)
[826] Ibid., p. 1573
[827] Michel Debré (1912-1996) was the French Prime Minister, under De Gaulle, from 1959-1962. He had been succeeded by Georges Pompidou at the time of these debates.

Towards the end of this session, parliamentarian René Sanson[828] provides the counterarguments to these expressions of discontentment, first by pointing out France's favorable trade balance during the past three years.[829] More fundamentally, Sanson charges that the fourth plan "… does not propose distribution reform but envisages an adaptation of the commercial 'machine' to the needs of consumers and predicts the need to take into account growing urbanism and the requirements of mass consumption."[830] Government politics are not inspired by a thesis, *a priori*, but by objective studies of the realities at hand. To date, enterprises are noted to have financed their needs on their own, but that they would need support in the future – particularly small- to medium-size firms – commercial exploitation through concentration[831] needs to be held in check. Sanson reminds parliament that public loans have increased from 15 million FF in 1959 to 177 million FF in 1960 and are now, under the fourth plan, set to increase to 700 million FF per year. These loans are favored for enterprises having a "rational plan" of geographic distribution and agree to practice sales methods representing "progress" in commercial techniques.[832] Finally, Sanson uses the fact that the French planning system has been covered in the last April issue of *Business Week,* with 10-pages devoted to dirigiste capitalism to conclude the how the "French way" has solicited the attention of Washington. Kennedy, the Gaullist remarks, has asked that a study be done to detail the foundation of France's recovery and economic health.[833] With this, Sanson declares the French system to strike a balance between totalitarianism and systems that veer towards "disorderly license." France provides hope and the currency of tomorrow: "liberty, coherence and discipline."[834] The discourse is thusly legitimized and is accorded recognition by the hegemonic power through its most popular business magazine. It is a powerful response to detractors, and it helps lock the teetering discourse in place.

Summary points and relevance for "truth claims

[828] René Sanson (1910-2004) served in the National Assembly from 1958 to 1962 and was a member of the Gaullist party, *Union pour la Nouvelle République.*
[829] Ibid., p. 1580
[830] Ibid., p. 1581
[831] Here, concentration appears to refer to commercial stores.
[832] Ibid., pp. 1581-1582
[833] Ibid., p. 1582
[834] Ibid., p. 1582

This chapter on the postwar policy discourse for France helps advance arguments being made for this dissertation in several critical ways. The key supporting evidence is summarized as follows:

1. The call to stave off decline and spread of ideas about productivity to different social "locations," namely in policy documents and new institutional configurations. That French elites were calling for productivity to deliver the country from imminent decline – as though bringing the theoretical predications of Polanyi and Hirschman to light – is clearly evident from official documents. These calls to avert decline are reiterated in the first two plans, with reports on the second plan declaring the plans to have succeeded in countering decadence. The discourse on productivity in France is clearly conceptualizing productivity according to the scientific discourse and that taking place in the United States at this time. French policymakers, for example, link productivity with efficient production *processes.* As a specific example, quality is associated with standardization and the lowering of cost price. Finally, ideas about productivity moved quickly from policy documents to institutional reconfiguration and empowerment, shown most forcefully by new productivity-oriented mandates conferred on INSEE and the new productivity centers that were created throughout France.

2. The rhetoric of productivity moves policy forward. It is hard to imagine policy outcomes to have occurred without a clarion call to promote productivity. Industry organization, such as that provided by the steel industry, and investment made in factory modernization are linked to rhetoric on productivity, as well as comparisons made with other countries. As the first two plans were not presented to parliament, it is difficult to gauge the extent to which these ideas resonated with a larger representative body. Still, French elites had to have embraced the arguments to provide the incentives necessary to promote industry concentration and modernization investment.

Compellingly, the early plan documents reveal that the French wish to promote productivity by infusing the ideas of the Americans in order to gain self-sufficiency. Such a declaration provides counter evidence to the

charge that the French adopted US ideas in order to secure foreign aid. French elites have one goal: to secure their place of prominence in the world economy, not to garner aid.

3. Contestation and implications for the rhetoric of productivity. Evidence of contestation is only available during debates on the fourth plan – the first time the plans were extensively debated in public. From these debates, it is clear that French parliamentarians query the way in which the "surplus" has been distributed, both in terms of wage levels attained, as well as how resources have been distributed to less advantaged regions. Social services have allegedly been neglected. Hence, the promise that more would be available, at no opportunity cost, for the collective whole appears to have not been completely delivered. Contestation exposes cracks in the discourse and suggests how it may be intrinsically unstable. But, contestation also provides evidence for the claim that alternative ideas about the dominating discourse can gain traction. As a more specific example, the pujadists clearly countered efforts on the part of INSEE to enlarge its statistical collection powers. In sum, contestation demonstrates that alternative interpretations of productivity and its effects are possible.

The Gaullists continue to support the plan as written, suggesting that it is the only way to survive against competitor nations. Parliamentarian Le Maire also counters challenges to the French planning system by pointing out US interest in the system. Comparisons among countries provide legitimization and help counter contestation. But comparisons also suggest that new ideas can be imported; hence, paving the way for changes in the dominating discourse.

Transition

As was shown in this chapter, by the early 1960s in France, parliamentarians began to question whether productivity programs had delivered on their promises. For the French, failure was linked to poor social distribution of whatever surpluses productivity growth had generated – the raw notion of productivity, as "efficiency," still held currency, but dissent about its effects on the collective wellbeing of the nation was evident: not only were social groups claiming that effects had been inequitable or non-existent, for

example, but some in parliament expressed concerns over a creeping American-inspired consumerism in France.[835] At one level, then, the deployment of rhetoric relating to productivity growth for the benefit of all had lost authority – it did not happen. There is, however, no indication that France reverted to a post-consumerism society after fissures in the discourse were brought to the fore in parliament. A full-blown American-style French consumerism may or may not have been held back by social or cultural values, as betrayed by doubts articulated in the debates over the fourth plan. It is not important. What is important is that the productivity discourse could still be used in a competitive way; higher productivity measures – or what effectively translated into a higher production of goods and services compared with other countries – remained a legitimizing force in French policy. The international standardization of national accounting methods is one way to show its importance. If the French did not wish to compare production with other nations, the country would not have adopted the accounting norms. In the next chapter, the way in which the productivity discourse influenced economic organization in the United States during the early postwar years is presented.

[835] See p. 215 of this chapter.

Chapter 7: The productivity of "process" during the postwar years (United States)

Postwar policy discourse in the United States: overview

Many of the points regarding theory and outcome discussed for France apply to the United States as well. The neutralizing power of the productivity discourse – transcendence or progress, the achievement of more or greater results than what had been before possible – is an apolitical message. As such, we would expect the potency of the concept to exert equally strong legislative and institutional effect in the US as in France. But the US is not France, and its relative world position differs from that of France. It is important to consider the time under study. At the end of World War II, the United States emerged as victor and efficient military power; France took note.[836] As such a power, we would expect US legislators, political, business and academic elites to export production ideas to a war-devastated and recovering France, and not the other way around. That is, we would not expect to find a great deal of curiosity about the ways in which the French have developed their own particular production models, at this particular historical juncture.

This chapter follows the rough outline of the previous chapter on France. The US, of course, has no formal economic plans; instead, influential pieces of legislation with historical consequences are analyzed to discern whether the scientific discourse on productivity – and its emphasis on labor-cost minimization – is reflected in congressional debates on selected bills. How the discourse influenced institutional development, and the sequencing of developments, is also investigated.

France is war-devastated and looking to the US as a model and competitor, but the US is locked in a bi-polar power balance with the Soviet Union. How might these critically different aspects of the "social context' translate into outcome? We would expect the ideological differences between the Soviet Union and the US to play in role in how meaning is attached to productivity: free enterprise aids productivity; state involvement impedes productivity. To credit the productivity discourse as a facilitator of policy

[836] This general point is discussed in chapter 6.

passage, the way in which the Soviet threat is discussed must be detailed in order to discern whether it was fear of the Soviet Union that drove policies forward or the promise of productivity. In other words, the arguments that cut across divisive political interests must be identified.

Productivity rhetoric and the Marshall Plan

It is well noted that passage of the Marshall Plan, formally titled the European Recovery Act (ERA), was anything but assured – many competing interests were at play.[837] What then helped to resolve the divisiveness, transforming a diplomatic initiative on the part of state-department officials, William L. Clayton and George F. Kennan, into a legal Act? The lengthy public hearings preceding its passage in April 1948 reveal essentially overlapping arguments that are used to persuade Congress of the urgency at hand, namely, the need to secure growing markets in Europe, not only to help rebuild Europe and develop the continent into a viable trade partner, but also to strengthen Europe as an ally on the front lines facing the "Soviet menace." It is noteworthy, of course, that the Soviet Union scored a communist coup in Czechoslovakia two months before the ERA became enacted. This section argues that the perceived Soviet threat may have become more entrenched by this event, but that the threat was already long front and central to the debates before the coup: passage remained uncertain all along this time. Moreover, the role to be played by the "communism card," as will be shown in the labor legislation covered, is ambiguous.

A more compelling argument can be made for the role played by the productivity discourse in speeding passage of the initiative. With divisive interests vying for government funds, the productivity discourse acted as a strong guarantor: productivity measures were not only the vehicles through which Europe would grow wealthier and stronger; they would also ensure that foreign aid to Europe would be transitory. And importantly, because productivity and production could be measured, or at least statistical measures were accepted as legitimate gauges, the concept provided a benchmark for action; the attainment of productivity and production goals would signal when progress was being made and, ultimately, when foreign aid would no longer be necessary. In contrast, by what particular gauge would the "Soviet menace" indicate when to

[837] See, for example, Michael J. Hogan (1996), "The Marshall Plan" in *The Cold War in Europe: era of a divided continent,* Charles S. Maier, ed., Princeton, NJ: Markus Wiener Publications

terminate funding for the European continent? Productivity, then, not only helps to combat the Soviet menace, by strengthening Europe, but it grows markets for the US, and it also provides the concrete measures and goals needed to guide policy implementation and termination; the call to promote productivity provides a credible exit strategy.

Productivity as a concept is often tied to the notion of democracy itself. In a statement issued by the President of the Congress of Industrial Organizations (CIO),[838] the benefits of democracy are its most effective endorsement, stating, "Our organization gives full recognition to the fact that under the democratic process, we have developed more extensively than any other Nation in history our present high productivity."[839] Either democracy causes productivity levels to rise, or high productivity levels ensure its survival – no matter: both are linked in the discourse. Labor, according to the statement, plays a key role in the process, and, again, its role is tied with productivity: "By force of its productivity and by its mass of numbers, labor properly organized can help the peoples of the world achieve freedom from fear and want and live in security and in peace."[840] Organized labor, then, is on board.

That production figured top and foremost among the goals to be achieved in Europe cannot be doubted. In a statement delivered by Earl O. Shreve, President of the Chamber of Commerce, he underscored the commitment of the 16 nations attending the conference on European economic cooperation in 1947 to "… engage in a strong production effort," as its first of four objectives. As proof that these countries will honor their commitments, Shreve then claims that both Belgium and Holland are already well on their way towards restoring their productivity, "…and France has indicated that in 1947 they reached 95 percent of their [coal] production of 1938, as against about 79 percent for 1946…."[841] These numbers, for Shreve, indicate that participating countries are committed to working and are not standing by passively to receive aid. Without the numbers, there can be no gauge, no guarantees. He goes on to say, "… if Europe is to raise

[838] The statement was presented during the hearings by James B. Carey, Secretary-Treasurer of the CIO. Philip Murray (1986-1952) was a steelworker and prominent labor leader in the United States.
[839] United States (1948), Congress, *European Recovery Program,* Hearing, Part III, January 29, 30, 31, February 2, 3,4, and 5, 80th Congress, second session, Washington DC: Government Printing Office, p. 1298.
[840] Ibid., p. 1306
[841] Ibid., p. 1343

her standard of living to a satisfactorily self-supporting basis and we ultimately to be relieved of the burden, American business should extend to the fullest practicable degree assistance in the form of manufacturing and management techniques."[842] Not only resources, but also ideas are to be exported to Europe. Is there contestation? Yes.

This statement, in fact, follows on the heels of that delivered by Agnes Waters, made famous (or infamous) for calling the Marshall Plan "treason,"[843] later charging that the plan serves only to penalize the victors of the war. For Mrs. Waters, the plan signified a divestment of "…properties, materials, resources and security." [844] In her statement, she frequently alludes to the Europeans as vulnerable, arguing that the resources delivered to the Europeans could easily become confiscated by the Soviets.[845] Although it is difficult to judge whether these ideas resonated with a significant proportion of the American population, the fact that Mrs. Waters is accorded a speaking platform at least suggests that these ideas – a counter discourse to the notion that a stronger Europe would ultimately benefit the Unites States – were recognized on the part of Congress. To address these dissenting voices, Congress needed to show that productivity growth in Europe would over the long term prove to be an investment, not a disinvestment, and that a stronger Europe would provide protection against a Soviet take-over rather than make Europe more attractive to the enemy. The essence of the argument delivered by Mrs. Waters is simply that aid is a zero-sum game: more resources for the Europeans meant less for the Americans. Productivity – and its property of providing more with less – helped to counter the charge. The Europeans could pay the Americans back.

But even were Congress to buy the argument that productivity growth in Europe would eventually buy them economic independence from the United States, the question still remained: why did the onus fall upon the shoulders of the United States? Secretary of State George Marshall responded, "The answer is simple. The United States is the only country in the world today which has the economic power and

[842] Ibid., p. 1343
[843] Ibid., p. 1333. Agnes Waters was a prominent and vocal member of the Mothers' Movement, a conservative, isolationist group founded in the late 1930s in the United States.
[844] Ibid., p. 1336
[845] Ibid., pp. 1335-1336

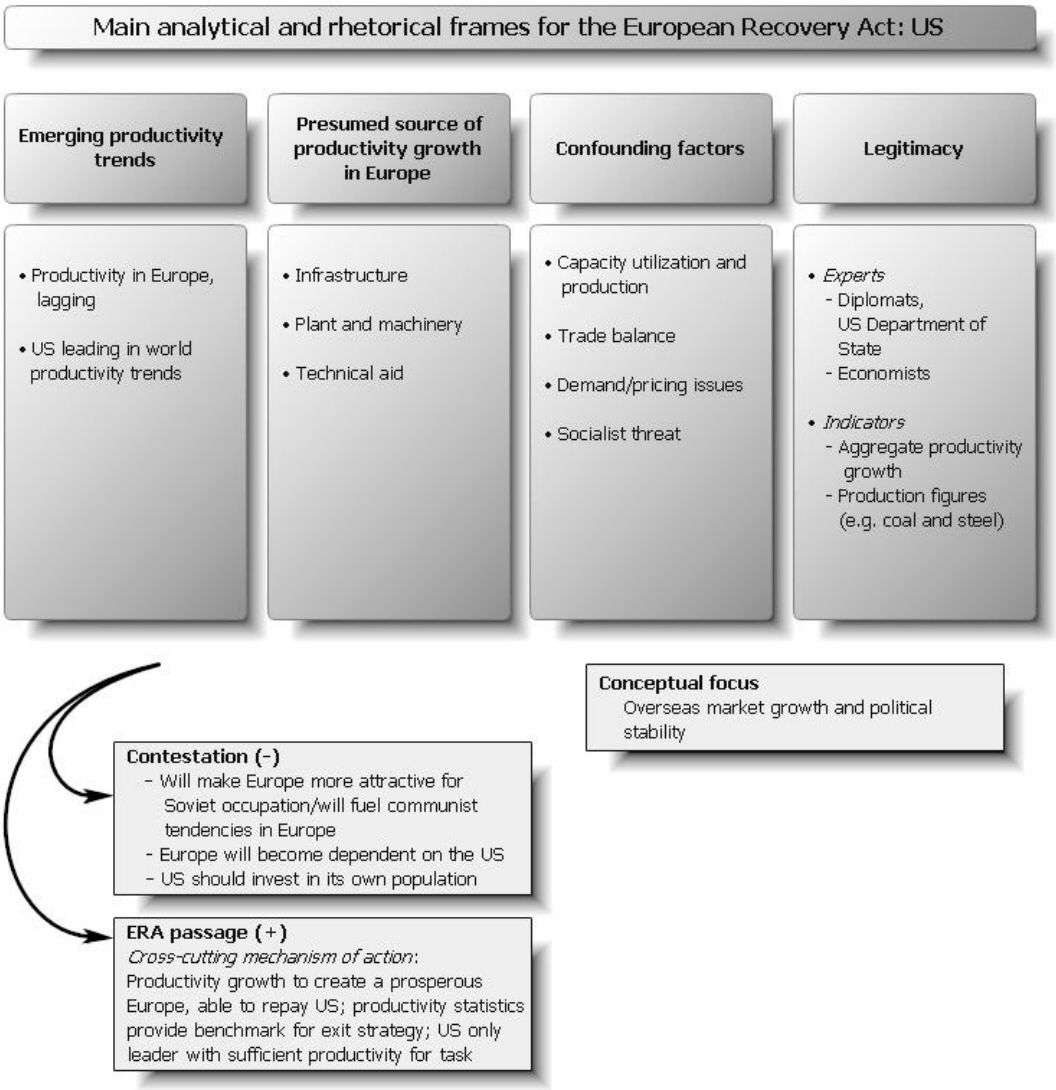
productivity to furnish the needed assistance."[846] Productivity, and the meaning attached to it, then, not only secures repayment, but it also provides the source of supply. Productivity confers leadership on its purveyor; with leadership, presumably, comes prestige. Only America can afford to perform this act – no other country can.

After lengthy and contentious debates, Congress passed the Economic Cooperation Act in April 1948, laying the basis for the Marshall Plan. It is noteworthy that Republicans controlled Congress at the time of passage, while the re-election of the beleaguered Democrat, Harry S. Truman, was considered a dubious bet.[847] There is no watertight way to explain the outcome by appealing to power interests. The fact that representatives from both labor and business bought into the idea of productivity and its promises for both Europe and the United States provides some indication that the discourse was politically neutralizing. A counterfactual, always problematic, at least helps to understand the way in which this discourse exercises its force: without the concept of productivity and its measurement, no benchmarks could be provided – "stability" is difficult to gauge. With productivity targets and benchmarks, on the contrary, goals could be set; once attained, aid could be terminated. This one aspect of using statistical measures as a way to gauge objectives was certainly effective in quelling disputes about over-extended aid and the risk that Europe would become dependent on the US. There can be little doubt that the discourse effectively helped seal the deal and delivered the act.

Figure 7.1 summarizes the arguments leading to the passage of the European Recovery Act as they relate to the discourse on productivity.

[846] United States (1948), Congress, *European Recovery Program,* Hearing, Part I, January 8,9,10,12,13,14, and 15, 1948 80th Congress, second session, Washington DC: Government Printing Office, p. 4
[847] See, for example: http://www.trumanlibrary.org/whistlestop/BERLIN_A/MARSHALL.HTM

Figure 7.1



Legislative initiatives: the focus on labor

Key legislative acts during the postwar years, such as the Employment Act of 1946 and the Taft-Hartley Act of 1947, were linked to labor issues. This outcome is not surprising, given the concern over lost

production days due to strike activity at this time in the United States. The productivity discourse was not only critical in terms of helping to shape and speed policy passage, but policy at that time exerted influencing effects on the way in which productivity was conceptualized and measured. As noted in the previous chapter, productivity statistics during the postwar years incorporated wage costs as a way to gauge input. Labor costs were important during a time of powerful labor unions and cost was a way of providing a benchmark for wage adjustments: unit labor costs during this time were directly linked to productivity, as they continue to be today, though in subsequent time periods, debates became more focused on total factor productivity and pricing issues (related to quality, for example) – shifts that parallel movements in the scientific discourse.

The Employment Act of 1946

In congressional hearings leading to the enactment of the Full Employment Bill of 1946,[848] productivity was directly linked to employment issues. First, full employment was a precondition for maximum production and, consequently, a high standard of living. In a statement to the Chairman of the Committee on Expenditures in the Executive Departments, Carter Manasco,[849] the office of the Secretary of Labor, Lewis B. Schwellenbach[850] declares that the country's "… productive capacity is sufficient to provide all Americans with the material basis for a good life."[851] Productivity must be related to remuneration in order for maximum production to be attained under conditions of full employment: "If this result should actually occur, then a larger number of wage earners would be protected against possible exploitation, and wage levels would more faithfully reflect any increases in labor productivity." The point being made is that full employment could, effectively, encourage greater instances of collective bargaining. Here, however, this "fear" is overcome by linking wage demands to productivity – objective measures that properly reflect the fruits of labor. In addition, heightened productivity, if so rewarded, also expands consumer expenditures,

[848] The Act eliminated "full" from the bill title.
[849] Carter Manasco (1902-1992) was a Democrat, representing Alabama, US House of Representatives (1941-1949). For all biographical information regarding US congressmen, see: http://bioguide.congress.gov/biosearch/biosearch.asp
[850] Lewis B. Schwellenbach (1894-1948) was a democratic Senator, representing Washington from 1934-1940 and was Secretary of Labor, under Truman, from 1945-1948. The memorandum from the office of the Secretary was signed by Frances Perkins.
[851] United States (1945), Congress, *Full Employment Act of 1945,* Hearings September 25, 26, 27, 28, October 2, 9, 10, 16, 17, 18, 19, 23, 24, 25, 26, 29, 30, 31, and November 1, 5, and 7, 1945 79th Congress, first session, Washington DC: Government Printing Office, p. 15

which brings the equation full circle by securing that which keeps employment "full."[852] Last, full employment guarantees are necessary to mitigate concerns that new, more efficient technologies could displace jobs and workers;[853] if the cycle is followed, the machine keeps rolling, with growth benefiting all sectors of society.

Full employment assurance, and its social "meaning," *is contested by the claim that government will thereby hinder individual enterprise.* Indeed, at the end of this statement, more effort is called upon to stimulate demand, as a way of ensuring, "… productive employment."[854] What is termed "useful employment" is equated with jobs that result in "useful products."[855] This argument is made, explicitly, as a way to limit government intervention: jobs cannot be created for their own sake. Once again, as with the passage of the Marshall Plan, the Employment Act of 1945 uses production as a way to benchmark end goals and confine government action to that which results in *useful production* and more production – per consumer demand. Without the benchmark, "useless" jobs could be created *ad infinitum.*

The idea of limiting government involvement is a theme that is repeated throughout the public debates – again the productivity discourse helps to subdue the distrust of government intervention, as well as legitimize its action. Harold D. Smith, Director of the Bureau of the Budget, [856] for example, opens his statement by declaring that, "We have made tremendous progress in building up our productive capacity, in improving our technical efficiency, and in raising our standard of living. But we have not yet succeeded in overcoming the economic insecurity that has attended that progress."[857] Productivity contributes to progress, but it also creates the conditions for *government oversight*: "The ups and downs in employment and production are no longer regarded as natural catastrophes."[858] Markets, then, cannot clear on their own.

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[852] Ibid., p. 15
[853] Ibid., p. 16
[854] Ibid., p. 19
[855] Ibid., p. 19
[856] Harold D. Smith (1898-1947), a Democrat, served as Director, Bureau of the Budget from 1939-1946. The Bureau later became the Office of Management and Budget.
[857] Ibid., pp. 58-59
[858] Ibid., p. 59

Thus, the particular role to be played by government is contested. Supporters of the bill, such as the Director of the Budget Smith, are careful to describe this role in broad terms: This bill before you establishes a procedure for presenting to Congress the Federal Budget in its general economic setting."[859] Private enterprise is accorded the primary role in creating full employment; government is there, essentially, to ensure that depressions are averted.[860] Smith underscores this main contentious points by conveying, "… I can better understand those critics who say there is not enough substance in this bill than those who say that it provides for too much. Still I think it wise to refrain from the inclusion of specific Government programs in this legislation."[861] Hence, here is someone, who might be prepared to define a more specific role for government, but clearly believes that specific mandates would confer too much power on government. A vaguely worded bill might obviate this.

There is no consensus about this point. To argue that the role of government was to be minimized while granting it vague powers to ensure full employment during times of expected rapid transformations – Smith alludes to productivity increases from technology and atomic energy as two factors fueling uncertainty[862] – begs the question: how? In fact, the Chairman of the committee, Manasco, refers to a historical prediction made by the Harvard Economic Service in November 1929, suggesting that the then recent downturn would not deteriorate into a protracted depression, as a way of driving the point home that statistics and forecasting were of dubious use. How would the President, then, make the decisions necessary to ensure full employment?[863] This question concerns many formidable factions opposing the bill, of which there were many.[864] The contestation underscores the fear that having a measurable policy goal, like *full* employment, would set an unstoppable machine in motion: big government.

[859] Ibid., p. 60
[860] Ibid., p. 61
[861] Ibid., p. 62
[862] Ibid., p. 63
[863] Ibid., pages 64 and 68.
[864] This point is discussed in Stephen Kemp Bailey (1950), *Congress Makes a Law: the story behind the Employment Act of 1946,* New York: Columbia University Press. The opposing factions are identified as the National Association of Manufacturers, Chambers of Commerce and the Committee for Constitutional Government, among others.

Chairman Manasco points out that the National Socialist Party at first advocated free enterprise, but then, to ensure full employment inaugurated programs that were forced upon the people – those in opposition were "liquidated in one of the concentration camps."[865] The same could happen in America, were everything to be planned from "… the cradle to the grave."[866] The link between big government and either totalitarianism, communism or socialism is repeated throughout the debates.[867] Still, these concepts cannot quite be measured; the link is inferred, but thus far, the process through which this bill would transform the United States into a totalitarian state is unclear, or at least not articulated. The rhetoric may resonate with conservative factions debating the bill – or even with the Chairman, a Democrat – but it is difficult to trace the rhetoric to what actually happened to the bill; there are simply no cross-cutting arguments about it. Like with the European Recovery Act, the alleged peril of communism enters the debate on full employment. But, also similar to what was revealed during the public hearings on the ERA, there is another element, more concrete, more measurable that needs to be safeguarded to keep the threat at bay: increasing labor productivity.

With the ERA, labor productivity would not only provide an "exit strategy" for US aid in Europe, but it was also presumed to ensure the economic stability necessary to thwart Soviet influence. For the case of the Full Employment Act, labor productivity could break what was decried as an insidious cycle of domestic government intervention. This reasoning becomes clear with the debates that follow and begin with the claim by William Whittington[868] that the effect of the bill, as currently worded, provides disincentives to work by virtue of government guarantees.[869] Indeed, this bill could encourage strike activity by offering alternative employment opportunities – as reasoned by representative Robert F. Rich.[870] The debate also concerns the added burden to national debt that such a bill would likely create. Would the government need

[865] Ibid., p. 69
[866] Ibid., p. 69
[867] For example, see Ibid., p. 78 and the discussion by Willford I. King, pp. 130-144.
[868] William M. Whittington (1878-1962), a Democrat, was a US Representative from Mississippi.
[869] Ibid., p. 91.
[870] Robert F. Rich (1883-1968), a Republican, was a member of the US House of Representatives from Pennsylvania. See, Ibid., pp. 124-125.

to borrow more money to pay for the unemployed, asks Walter Judd?[871] The key offered by Wright Patman:[872] maintain national income growth to pay off the national debt and provide employment at the same time.[873] Productivity growth, then, renders government guarantees useless.

The testimony delivered by Willford I. King,[874] Chairman of the Committee for Constitutional Government, provides key evidence for the potency of the productivity discourse to speed policy passage by cutting through divisive conceptual points and serving up, instead, a neutralizing, benchmarking equation. The reasoning provided by this NBER economist answers the doubters, provides an alternative interpretation of how the bill could be rendered sustainable – with his evidence sealed by his stature as an economics expert and scientist.

King first decries the ambiguity embedded in the bill and the way in which "abuses" could lead to ruinous outcomes.[875] Importantly, King then argues that labor would not support a measure promoting "full employment," which could imply higher work hours per week, but desires, "… that minimum of toil which will result in production sufficient to enable the typical worker to earn an adequate real income."[876] King wants to circumscribe the debate to how much work, what kind of work and what pay for the work delivered – while markets remunerate work at the "value of production," governments generally follow fixed rates. The link between this practice and threats to private enterprise thus becomes clear: "… the proportion of the Nation's working force employed by the public measures the extent to which socialism has displaced free enterprise … if the term 'remunerative' is interpreted to mean some definite figure, the result might well be to substitute in our economic system, more or less inadvertently, statism for private

[871] Walter H. Judd (1898-1994), a Republican, was a representative serving Congress from 1943-1963. See, Ibid., p. 130
[872] Wright Patman (1893-1976), a Democrat, was a representative of Congress from 1929-1976.
[873] Ibid., p. 130
[874] Willford Isbell King (1880-1962) was a noted statistician and economist, serving as the Chairman of the Committee for Constitutional Government – a conservative body opposing a majority of New Deal legislation. King wrote, *The National Income and its Purchasing Power* in 1930 for NBER, as well as numerous other works dealing with employment and income issues. In 1927 King took on an academic career, as professor of economics at New York University.
[875] Ibid., p. 130
[876] Ibid., p. 130

enterprise."[877] Wage rates must correspond to abilities – such a formulation, according to King – would speed passage of the bill.[878]

Importantly, King does not advocate complete *laissez-faire* politics – such could also make America vulnerable to totalitarianism: "… the American people were thoroughly disgusted with the unemployment situation in the 1930s and that there is grave danger that, if such a situation again recurs, they will choose the security which they believe they can obtain under socialism in preference to the freedom to be unemployed which they would have under free enterprise."[879] The conundrum that needs to be solved, then, is how to achieve a "proper" level of employment, using informed government measures? King offers: "If the Government is to improve conditions it is not sufficient for it merely to act; its action must be based upon a *logical and scientific course of procedure*."[880] In other words, debates so divisive need arbiters: economists and productivity measures are served up as candidates.

The potentially devastating economic scenario painted by King essentially assumes that government needs to fund the program. However, he continues, because whatever money the government raises from the private sector – through taxation or bond sales – its spending power decreases by the same amount: what employment is gained through government means is exactly cancelled by employment losses in the private sector. Thus the only option left: print money and generate inflation, thereby obliterating private savings incentives.[881] King wants guarantees against such action but suggests that, by doing so, the bill would diminish its appeal to current supporters. King argues for a way out by explaining, "Figures are now available which show conclusively that the number of hours of employment given by all the factories in the United States depends almost entirely upon the size of what we may refer to as the '*key ratio*.' This is the ratio of total net new spending power to average hourly earnings of factory workers."[882] A gauge is thusly provided. How is this ratio derived and what is the relationship to productivity?

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[877] Ibid., p. 131
[878] Ibid., p. 131
[879] Ibid., p. 132
[880] Ibid., p. 132
[881] Ibid., p. 133
[882] The key ratio: (*total take home pay)/(average hourly labor costs*) = *employment hours*. Ibid., p. 134

The key ratio

First, in terms of derivation, once the assumptions are made, the logic follows: "Since the total 'value added by manufacture' is dependent upon the aggregate net new spending power in the Nation, and since wage workers receive an almost constant fraction of the value added by manufactures, it appears inevitable that the total 'take home pay' of all factory workers must depend on the volume of net new spending in the Nation"[883] – such is the numerator. King then states what falls out from the math: that total employment hours available are determined by average hourly labor costs – the denominator – in relation to total pay (total pay divided by the average hourly factory rate).[884] True to the math, and as King points out, employment can increase if either the numerator increases, or the denominator decreases.[885] And so: either net new spending must rise, or average labor costs must decline in order for employment hours to increase.

King has already assumed that labor is receiving a near-constant fraction of the value added produced by manufacturers. Does it not then follow that average labor costs would increase in line with rises in value added? It depends on the definitions used. If yes, then the ratio would seem defined so as to remain relatively constant over time. In the article by Frederick Mills,[886] value added is considered to be a proxy for the sum of total product sold; King does not define value added. King presents a chart, "chart 1," [887] which shows labor's near-constant share in the US of the "consumer's dollar," as well as of the "product of all our factories." For "net new spending," King is drawing from a table, indicating the variable as being the "sum of realized national income (as estimated by the National Industrial Conference Board) and

[883] Ibid., p. 137. King presents "Table III" in his statement, p. 136, showing data of "net new spending' "value added" in the United States from 1919 to 1939. Movements (increases/decreases) in the data correlate.
[884] Ibid., p. 137
[885] Ibid., p. 137
[886] See chapter 4 for a review of this article.
[887] Ibid., p. 136

changes in the combined volume of demand deposits and money, as shown in Federal reports."[888] In national accounts, national income can be calculated either by calculating incomes (remuneration of the factors of production) or through expenditure, GDP, which is equal to income by assuming that income is spent on production. The ways in which these data are assembled is not noted. What is important, for the purposes of this debate, is the meaning attached to the ratio.

If the ratio is to be useful, at all, it must be shown that production can increase without causing a subsequent increase in average labor costs – that production increases do not stem from productivity growth (or that wages do not follow productivity growth). If wages are assumed to rise with labor productivity growth, it then follows that the increase in production that is not accompanied by an increase in average wage costs [bracketing capital – which was largely the practice during this time period] can only come about by employing larger amounts of labor: more employment hours. More labor must be available. And demand must be growing to accommodate the increased production. Alternatively, if production stands still, but average labor costs decline, more employment hours will be available. Would such an outcome be desirable for an economy? It wouldn't seem so, nor is the mechanism by which this would occur intuitively obvious.[889] The jury is no longer out: the goal is to increase production, with the average wage rates remaining stagnate, or rising less quickly than the rate of increase in production.

The math, of course simplifies a complex reality of multiple labor qualities and diverse forms of capital. But, most importantly, the math simplifies the political calculation: "The feeling seems to be widespread that it is the duty of manufacturers to give employment to all would-be workers released from war jobs, and that, if they fail so to do, the conclusion is inevitable that private enterprise has broken down. However, table IV proves that factory employment is merely a function of net new spending and wage rates."[890] From this seemingly apolitical point of view, arguments can be made in favor of increasing employment hours by putting a brake on minimum wage legislation: "Even if the demand for a given class of products is so

[888] Ibid., see footnote 1 for table IV on page 137.
[889] Economists have traditionally argued, in any event, that wages are sticky downward.
[890] Ibid., p. 141

intense that any increase in wage rates can be passed on to the consumers without noticeably lessening sales volume, the arbitrary wage increase still causes unemployment," essentially because consumers will then have less money to spend on other goods.[891] But consumers are, presumably, wage earners, too; the argument is empty.

Later in the text, King uses the ratio to argue that labor monopolies (read: unions) must therefore be prevented (by government!) from, "… shoving up wage rates faster than the productive power of labor increases."[892] Employment insurance, however configured, encourages these wage spirals that, then, create unemployment by forcing employers to compensate labor for more than the value produced. History, according to King, has shown us the dangers of following this path: "In England, this system made from one to two millions of workers abjects [sic] of public charity for almost the entire period from World War I to World War II. In Germany, the volume of idleness created by unemployment insurance was proportionately even greater, and the resulting discontent brought Hitler into power and paved the way for World War II."[893]

At this point in history, labor productivity was largely measured by the reciprocal of labor requirements, and, in some papers, by the reciprocal of deflated labor cost.[894] Here, the argument is being made that only productivity can justify wage increases: "… higher hourly or piece rates not justified by increases in productivity, increase expenses per unit of output, raise the selling prices of products, diminish sales volume, throw people out of work, decrease the total wage bill in the Nation, lower the national income, and reduce the net volume of spending power."[895] King proposes that the government can avoid this scenario by "encouraging" employers to adopt the practice of paying labor a "definite fraction of the distributable income of the enterprise in place of paying laborers fixed rates per hour."[896] This passage is important because it reveals that sides agree something has to be done – a law needs to be legislated and

[891] Ibid., p. 141
[892] Ibid., p. 142
[893] Ibid., p. 142
[894] See, for example, discussion on productivity measures during the early postwar years in chapter 4.
[895] Ibid., p. 142
[896] Ibid., p. 142

King, in fact, admits as much, adding that some "guarantees" can be made without compromising private enterprise.[897] But, King's suggestion implies as much market manipulation as fixed wage rates.

King is essentially telling Congress that the way to pass this bill is to amend it by neutralizing its terms. Still, it is no small irony that King's appeal to scientific – neutral – reasoning is marred by his own argument: productivity increases and deserved subsequent wage hikes could lead to decreases (or no change) in the level of employment, if the "key ratio" is serve as our mathematical guide. The assumptions made can also be challenged, surely. Do workers receive a relatively fixed percentage of value added, as defined at that time?[898] Issues familiar to the productivity statistical debate at the time – such as differing qualities of labor[899] – here plague the analysis – average wage rates, and in particular, un-weighted average rates, hide more than they reveal. At this early juncture, capital inputs are bracketed for convenience; surely this omission, alone, renders the exercise tentative, at best. Scientific reasoning may require parsimony, but policy affects a complex reality.

Even though the simplified logic presented can be queried, it does not matter to the vote outcome. The debate has been neutralized by seemingly objective benchmarks, and congress cannot – or does not – mount a challenge. What is important is that an *idea* about production and productivity makes it seem *as if* breaks can been placed on the government and free enterprise thereby safeguarded. As if the above arguments were not sufficiently strong to convince all doubters, King offers a last push, illuminating for the way in which productivity is thrust at the center of the debate: "The idea advanced by labor leaders and others that the great improvements in production occurring during the recent World War tend to generate unemployment is wholly without foundation. The larger the volume of production, the greater is the quantity of goods sold, and therefore the larger becomes the national income and the net volume of new

[897] Ibid., pp. 143-144
[898] Although an abundance of literatures does suggest that labor's share of income has been relatively stable over time, some scholars question measurement and definitions used to traditionally calculate this share. In addition, more recent scholarship and policy work have noted a marked decline in labor's income share with the onset of globalization. See, for example, Alan Krueger (March 1999), "Measuring Labor's Share, NBER Working Paper no. 7006; http://www.nber.org/papers/w7006 and Ann E. Harrison (October 2002), "Has globalization eroded labor's share? Some cross-country evidence", UC Berkeley and NBER: http://www.econ.fea.usp.br/gilberto/eae0504/Harrison_Glob_Labor_Share_2002.pdf
[899] See the analysis of the work by Frederick Mills covered in chapter 4.

spending power … the more spending power there is, the stronger the demand for labor."[900] In order for more goods to be sold, *ceteris paribus*, demand must increase in like measure. King continues that greater spending power will increase the demand for labor. From this point, he argues that since, "… labor tends automatically to get a fixed share in the value product, it follows that doubling the average productiveness per man-hour automatically doubles the average hourly pay of workers per man-hour."[901] Workers, now in increasing demand, do not lose their jobs – they grow wealthier.

Mills has shown in his article[902] that productivity changes affect economic players in different measures, depending on a host of conditions that he enumerates in his paper – productivity does have distributional implications, far more complicated than those detailed by King. Yet, even if this point were bracketed for the sake of simplicity, King goes on to suggest that government should not, therefore, legislate for fewer work hours as a way of ensuring that workers do not become displaced by productivity. Here, King suggests that workers, themselves, now paid more highly, will voluntarily opt for fewer work hours: "As labor becomes more productive, real pay per hour automatically tends to increase … the utility to the worker of the dollar of pay diminishes, and he begins to consider more favorably the idea of substituting leisure for pay."[903] Clearly, then, at least two competing forces result from increasing labor productivity: (1) higher pay, but fewer hours of (chosen) work, in which case the overall effect on employment hours cannot be determined; (2) labor demand increases because of heightened production and spending power, in which case, either more hours will be offered and workers will want to fill those hours, or the increased productivity will be sufficient to cover the added demand, in which case, employment hours do not necessarily increase.

King may not be arguing for increasing hours of employment – he wants to show that productivity growth is a win-win situation for all parties. Again, King appeals to "facts" that have been explained by

[900] Ibid., p. 144
[901] Ibid., p. 144
[902] Mills (June 1937), which is covered in chapter 4.
[903] United States (1945), p. 144. The argument, ironically, is similar to one made by Weber, as noted in the introduction, that labor is not essentially constituted to want more, materially. Here, however, King is implicitly arguing that labor is essentially constituted to not want more materially, than the standard of living to which he has gown used.

mechanisms no more complicated than the driving force of Adam Smith's "invisible hand." But, King is not against legislation: "It is to be sincerely hoped that the full employment bill, if enacted, will be in a form which will dispel the fears of those who think of it as an instrument for increasing the Government debt, furthering inflation, destroying thrift, and fastening upon the Nation a system of regimentation and totalitarianism."[904] Instead, King urges that, "By amending the bill along the lines suggested above, it would be possible to gain for the bill the support of all those classes of citizens interested in advancing the welfare of the laboring class, that class making up the largest single group of our population, and hence entitled to primary consideration."[905]

King's testimony is representative of other economists called to deliver statements about the bill. Professor Hudson G. Hastings, an economist at Yale University, for example, declares the fallacy of the common assumption that technological efficiency creates unemployment, a point on which all economists agree.[906] And Hasting, like King, believes that work guarantees will unquestionably lead to, "… a complete totalitarian economic economy with a dictator running it."[907] The benefits of growing productivity are not contested, but the dangers of subsequent unemployment are, as are the distribution politics. William Green, President of the American Federation of Labor, states the key contested point so clearly: "It is only when we produce a surplus that we have much unemployment and that is because we are so efficient in the production field and not efficient enough in the buying field. Wages must move up with production."[908] And the dissent was not limited to labor representatives. Representative Outland[909] expressed the idea that, "Assurances of job opportunities would break down this fear of increased production, would eliminate resistance to technology."[910]

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[904] Ibid., p. 144
[905] Ibid., p. 144
[906] Ibid., p. 669
[907] Ibid., p. 670
[908] United States (1945), Congress, *Full Employment Act of 1945,* Hearings July 30, 31, August 21, 22, 23, 24, 28, 29, 30, 31 and September 1, 1945 79th Congress, first session, Washington DC: Government Printing Office, p. 512
[909] George E. Outland was a democratic congressman, representing California from 1943-1946.
[910] Ibid., p. 138

The argument does not cross any divides. The push for useful, productive labor wins the day, and assurances – rights – to employment are linked to disincentives to work and creeping communism. On the day of bill passage in the Senate,[911] Joseph H. Ball[912] speaks to these ideas when he stated, "… if we as individuals are to turn over to the Government our obligation to produce something, to do our part of the job of achieving security for ourselves and our families, I fear that inevitably we shall also turn over to the Government a large part of our individual liberties and freedom."[913] The rhetoric, coming from a Republican in a Democratically controlled congress, is as crosscutting and prevalent in debates as that championing productivity as the ultimate guide of wage levels. The lingering shadow of the Great Depression is sufficient to garner majority support for government oversight and attentiveness to problems of unemployment. But guarantees are anti-productive. It is difficult in the passages documented to discern whether it is the rhetoric of work disincentives or the threat of totalitarianism, or a fear of ballooning government expenditures, that is at work – or a combination thereof.

The path to passage was long. According to Robert M. Collins, the bill underwent several revisions, each version more diluted than its predecessor, and reviewed by the House Committee on Expenditures in the Executive. Collins, as becomes clear by analyzing the statement of King, notes that conservative elements agreed on the need to legislate policy for government oversight; but no specific mandates are conferred.[914] The slightly modified Senate version – S.380 – of the original bill introduced by Patman overwhelmingly passed the Senate. But, according to Collins, this version had deleted the commitment to "full employment."[915] The revision is important as it removes an official benchmark to be reached by the government, assuming "full" can be defined. Collins then goes on to recount that an alternative version, more liberal in content, was introduced by a House version introduced by Republican Charles La Follette. This version was rejected, and, according to Collins, with greater vehemence. [916] A subcommittee was

[911] United States (1945), Congress. "Full Employment Act of 1945," *Congressional Record: Senate,* 91, September 28, 1945, Washington DC: Government Printing Office, pp. 9110-9154.
[912] Joseph H. Ball was a Republican senator serving Minnesota from 1939-1948.
[913] Ibid., pp. 9131-9132
[914] Robert M. Collins (1981), *The Business Response to Keynes, 1929-1964,* New York: Columbia University Press. See discussion on pp. 102-103
[915] Ibid., p. 104
[916] Ibid., p. 104

subsequently formed, with Whittington[917] serving as the "swing man," playing a major role in drafting the legislation that would not consider full employment a "right," but would enable employment of those willing to work.[918] The Employment Act was signed into law in February 1946, without guarantees of full employment or "planning mechanisms."[919] It is interesting to note how the final act is worded. Stephen Kemp Bailey has published a version of the final policy declaration, using different type sets to identify revisions by the Senate, the House and the Joint Conference Committee. Words and phrases that differ from the original bill are underlined in figure 7.2 below.[920]

The difference between promoting maximum employment and guaranteeing full employment may not appear readily obvious; however, the way in which the entire text is worded clearly indicates that the role of government has been eviscerated. The government is here mandated to promote free enterprise, *through which* the outcome – maximum employment and maximum production – will materialize. Work must be useful and be "afforded" under conditions only to individuals "willing" to work. The fact that work must be linked to production and purchasing power falls out from the productivity math provided by King. According to Bailey, conservatives celebrated the law as a victory, leaving other interest parties, such as the CIO, infuriated.[921] The enactment of this law, in and of itself, exemplifies that *laissez-*

Figure 7.2

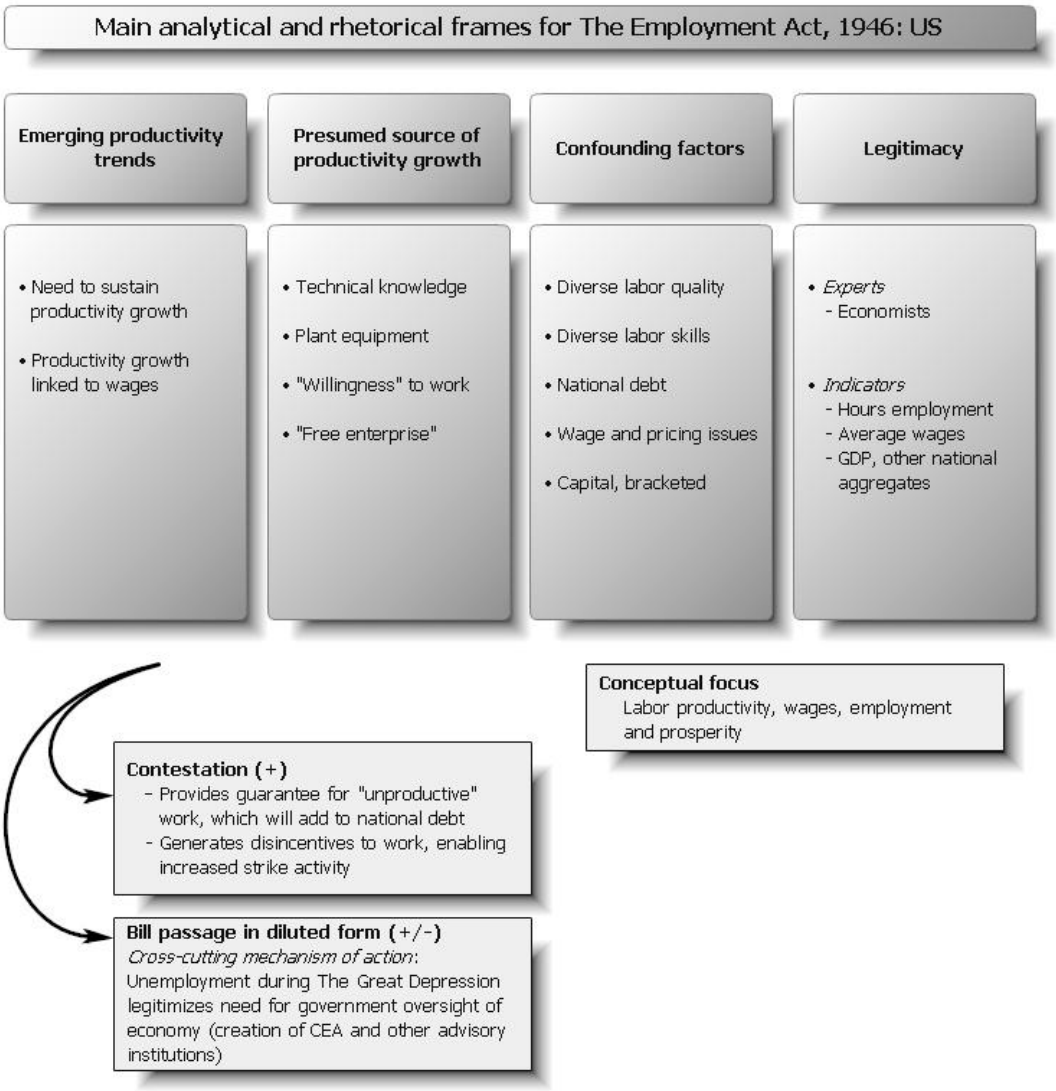
Sec. 2. The Congress hereby declares that it is the continuing policy and responsibility of the Federal Government to use all practicable means consistent with its needs and obligations and other essential considerations of national policy with the assistance and cooperation of industry, agriculture, labor, and State and local governments, to coordinate and utilize all its plans, functions, and resources for the purpose of creating and maintaining, in a manner calculated to foster and promote free competitive enterprise and the general welfare, conditions under which there will be afforded useful employment, for those able, willing, and seeking to work, and to promote maximum employment, production, and purchasing power.

[917] Collins describes Whittington, whose debates are covered earlier in this text, as a "moderately conservative Democrat." Ibid., p. 104
[918] Ibid., pp. 104-105
[919] Ibid., pp. 107-108
[920] For a breakdown of the changes by specific legislative body/committee, see Stephen Kemp Bailey (1950), *Congress Makes a Law: the story behind the Employment Act of 1946,* New York: Columbia University Press, p. 228
[921] Ibid., pp. 233-234

faire capitalism, however understood, has to be framed. If not, there would be no driving force for the law.

The productivity discourse was pivotal in bringing about a change in the way the law became framed – productivity and its rewards were linked to an ever-expanding market, with labor being justly remunerated for its efforts. Without productivity, there could be no benchmarks in order to define "useful work." Moreover, productivity, in this debate, provides workers with the higher incomes necessary for continued and increasing consumer spending. The latter ensures employment. Should the government encourage increased productivity? The policy declaration does not make this clear, but the way in which the text is worded could certainly provide the raw argument for such encouragement – productivity enhancement could be linked to heightened competitiveness, or the basis for improvement in the "general welfare." It is important to understand the way in which the argument of productivity undergirds the passage of this law. Presumably and in accordance with public statements made during these hearings, legislation is needed only to avert crises – specifically, a second major Depression. How was this concern to be addressed by the act? The concern was to be addressed through more potent legislation effectively prohibiting collective bargaining on an industry-wide basis: The Labor-Management Relations Act of 1947. Key components of the productivity discourse that influenced the passage of the Employment Act are summarized below in figure 7.3

Figure 7.3



Labor-Management Relations Act, 1947[922]

[922] The Act is more popularly known as the Taft-Hartley Act after the bill's sponsors. Robert Taft was a Republican Senator for Ohio (1939-1953) and Fred A. Hartley Jr. was a Republican representative for New Jersey (1929-1949). The bill amends the National Labor Relations Act (NLRA) passed in 1935. The NLRA is sometimes referred to as the Wagner Act, after the bill's sponsor, Robert F. Wagner, a Democratic Senator from New York (1927-1949).

On the day when the US House of Representatives passed bill HR 3020,[923] a lively debate took place in Congress, with all major proponents and detractors voicing their respective opinions about the bill and what it would accomplish or destroy for labor relations in America.[924] At the start, opponents to the bill had reportedly leveled the charge that corporate interests had authored the bill.[925] Powell referred the House to the first witness called during the opening of the hearings, Dr. Harold Metz of the Brookings Institution, the economist whose work, *A National Labor Policy*, had laid the foundation for major sections of the bill under debate.[926] The fact that an economist was, in fact, so influential in the drafting of this bill is consequential, for it, once again, helps to de-politicize the issue at hand: the economist-expert is neutral, or at least not affiliated with any particular political interests. And, from the statement delivered by Metz during congressional hearings, it is clear that his ideas and those of his co-author, Meyer Jacobstein, provide the groundwork for the bill.[927]

Metz opens his statement by declaring that, "… free collective bargaining rather than any form of compulsory settlement due to government interference is the preferred method of resolving labor-management dispute [principally because] … there are no really objective rules for determining the conditions of employment."[928] Metz then goes on to explain that arbiters may typically craft a compromise from the demands of the employer and employee, with both parties then proposing extremes in order to achieve a reasonable result. Whatever technique chosen, according to Metz, will be arbitrary and politically based. The economist also refers to the fact that compulsory settlements are often based on cost of living scales, calculated from base periods, which then do not incorporate benefits from technology – the source of heightened standards of living.[929] Productivity is not directly mentioned in this statement, although Metz obliquely refers to this argument when he makes his argument against industry-wide bargaining, a major

[923] The Senate version, S 1126, was passed shortly after passage in the House.
[924] United States (1947), "Labor-Management Relations Act, 1947," *Congressional Record,* 93, April 17, 1947, pp. 3614-3674), Washington DC: Government Printing Office.
[925] Powell was a Democrat from New York. Ibid., p. 3621.
[926] This is reported on p. 3621, Ibid. See, Harold W. Metz and Meyer Jacobson (1947), *A National Labor Policy,* Brookings Institution, Washington DC.
[927] United States (1947) Congress, *Amendments to the National Labor Relations Act,* Hearings, volume 2, February 11, 12, 13, 14, 15, 17, 18, 19 1947 80th Congress, first session, Washington DC: Government Printing Office, pp. 225-243
[928] Ibid., p. 225
[929] Ibid., p. 225

component of the bill and its most controversial element: "… it is impossible to relate the determination of wages to the capacity of different establishments to pay a given rate of pay."[930] In other words, fixing wages on the basis of what the least-performing firms can afford to pay will provide windfall gains to those more efficient firms that can afford to pay higher wages, while fixing wages according to latter's ability to pay will push the less efficient producers out of the market. Moreover, under industry-wide collective bargaining agreements, labor monopolies form, which renders the public vulnerable and invites government intervention.[931]

Metz specifically advocates that labor be subjected to anti-trust laws in order to forestall labor monopolies. By legislating against monopolistic behavior, which he defines as workers engaging in action against two or more employers in the same industry,[932] Metz argues that collective bargaining can continue without a need to invoke "Government machinery."[933] But Metz then goes on to address members of congress, "When public inconvenience is caused by a strike and continues over a long period, it is up to you gentleman to do something to settle the thing."[934] Metz is attempting to distinguish between legislating against such events and legislating to encourage government settlement, the latter leading to the development of a more intrusive government apparatus. Government must enforce laws, not engage in negotiations. Metz underscores this point by recalling events following the passage of the Railway Labor Act in 1926, when the emergency boards in place – designed to obviate blockage – were allegedly engaged more intensely than expected simply because the system was there and available for use.[935]

Metz is delivering an argument that squares with economic theory: government negotiating on behalf of labor and/or management distort markets; in the free market, workers are paid their marginal product – monopolistic elements interfere with the process of reaching equilibrium. The fact that industry-wide bargaining became the focal point of debates in Congress is telling in and of itself, because it rested on a

[930] Ibid., p. 226.
[931] Ibid., p. 226
[932] Ibid., p. 227
[933] Ibid., p. 233
[934] Ibid., p. 233
[935] Ibid., pp. 239-240

popularly held misconception of efficiency – the ability to reach maximum production. But, Metz takes the argument in another direction by suggesting that an industry-wide wage rate forces smaller less-efficient producers to close shop, or worse, to collude and abrogate anti-trust laws in order to "…meet the labor situation."[936] This reasoning suggests that workers receiving a wage lower than what they would doing the same work for a more efficient producer would be contented to stay employed by the less efficient producer, or that labor unrest would not ensue because workers understood that the market had reached competitive equilibrium and they accept their relative inefficiency; or, simply, that labor is fixed in place.

Metz does not address why industry-wide collective bargaining became problematic in the first place. If heightened productivity was to deliver higher wages and more goods (and/or leisure) for everyone, worker discontent could certainly provide evidence for a promise gone unfulfilled, as was seen in the French parliamentary debates on the fourth modernization plan. In fact, the charge is made during congressional debates that the bill disciplines labor, but leaves management free, evidence that power interests enter the equation of surplus distribution, though are conspicuously absent in productivity rhetoric, generally. Representative Marcantonio claims: "The gentlemen in control of monopoly industry and monopoly finance do not have to sit down formally to fix a wage policy, they do not have to enter into a written agreement among themselves; the understanding is fixed by community of their interests."[937] In fact, this idea that labor is treated unfairly is alluded to throughout the debates. Representative Celler, for example, reports record profit earnings during the first quarter of 1947 for corporations generally to infer that industry's gains are not being distributed to labor.[938] Representative Eberharter noted that one-third of national assets were owned by 200 of the country's largest corporations, a figure he reports to have climbed to 60 percent at the time of the debate.[939] The issue that labor is subjected to a double standard is divisive; it is a position fixed within the center-left.

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[936] Ibid., pp. 241-242
[937] United States (1947), *Congressional Record,* p. 3619. The citation is from Vito Marcantonio, a member of the American Labor Party during the 80th Congress, representing New York (membership varied between 1-2 members during this Congress).
[938] Ibid., p. 3619. Emanuel Celler was a Democrat representing New York from 1923-1973.
[939] Ibid., p. 3630. Herman Eberharter was a Democrat representing Pennsylvania from 1937-1958. A variation on this point is made by Adolph J. Sabath, a Democrat, representing Illinois (1949-1952). Ibid., p. 3633

But the charge that labor monopolies may have formed as a reaction to concentrated powerful industry[940] does not play strongly in the debates. Economic experts instead ground their arguments on the basis that *labor concentration thwarted productivity*, or at least placed a break on production, and was on the contrary a forceful argument in the debates leading to bill passage. This argument – the so-called "politics of more"[941] – overshadowed charges made that productivity had failed to deliver its fruits to labor. Indeed, nary a trace of the argument that more would be available for less can be found in the debates on April 17, 1947, the day of the bill's passage. In 1947, labor thwarted the productive capacity of the country, or the capacity to achieve maximum production – full stop. The shift in focus from productivity (efficiency) to production (more) may, then, be explained by the fact that productivity on its own did not appear to deliver; workers are unhappy. But the reason might be simpler still. The argument that a single wage cannot cover varying levels of productivity does bring the concept of productivity into the debate, and as will be argued below, it helps to focus the debates on this issue. But there is no consensus regarding the effect of a single wage on national welfare – the notion is too ambiguous to be a forceful mover of policy. Production maximization, by contrast, resonates across the aisle and can be singled out as the principle on which this bill passes. What is the evidence for this claim, and does it represent a discursive shift?

It is first important to note that following Metz' statement to congress, a summary of *A National Labor Policy* is presented. The summary of conclusions includes six sections, under each of which two-five separate policy recommendations and/or justifications are subsumed.[942] It is clear from the debates that took place on April 17, and, in accordance with Metz, that members of congress do not dispute recommended prohibitions for sympathy strikes, jurisdictional strikes and boycott strikes. It is equally clear that members of congress from both sides of the aisle agreed that industry-wide *strikes* were undesirable;[943]that labor monopolies place the public in a vulnerable position is not heavily contested. Again, the issue as to whether or not labor was receiving its fair share of productive effort was argued at the

[940] The concentration of the steel industry and its influence on pricing was debated in Congress at this time.
[941] The allusion is again to the work of Robert M. Collins (2000).
[942] United States (1947), *Amendments to the National Labor Relations Act,* p. 243
[943] Representative William Lemke, a non-partisan Republican, noted that labor leaders all supported the prohibition against wildcat and jurisdictional strikes, United States (1947), *Congressional Record,* p. 3631

margins. The contestation was not sufficiently strong to overpower the need to keep the production machinery moving. The *key split came down to how industry-wide collective bargaining should be regulated*. In a sense, then, linking wages to efficiency and the fact that an industry-wide wage obscures this relationship secures consensus about what issue is key to debate. But in terms of policy outcome, what needs to be shown is the *mechanism through which the split was overcome*.

Representative Hartley opened the debates on this day, describing the purpose of the bill to "… prescribe fair and equitable rules of conduct to be observed by labor and management in their relations with one another which affect commerce, to protect the rights of individual workers in their relations with labor organizations whose activities affect commerce, to recognize the paramount public interest in labor disputes affecting commerce that endanger the public health, safety, or welfare, and for other purposes." [944] Shortly after, representative George A. Dondero[945] betrays this seemingly mild-mannered wording by decrying the alleged effects of the Wagner Act: record-high strikes: 4,985 counted in one government report for 1946, or 116,000,000 "man days lost."[946] The loss is considered to thwart progress and underscores the way in which relations between employer and employee have seriously deteriorated, risking the health of the economy. At another level, the loss of work is equated with a loss of dignity and freedom, with individuals no longer willing to do "honest work." More to the point: "President Truman's statement that prices must come down or wages go up is fallacious and unsound. Production of goods at reasonable prices is the remedy. Strikes and slow-downs bring about the scarcity of consumer goods and the needs of our people for more goods result in higher prices for everything."[947] It is the simple arithmetic of "more," obscuring complex economic relationships between demand and supply, profits and wages, as well as production functions generally. Productivity as a measure of surplus – or process efficiency – is ceding territory to the satisfaction of growing consumer wants and needs.

[944] Ibid., p. 3616
[945] George Anthony Dondero was a Republican representing Michigan (1933-1957).
[946] Ibid., p. 3617
[947] Ibid., pp. 3617-3618

The loss of production allegedly comes from the concentration of power. Does this notion pass the bill? It does not seem to be the case. The bill being debated is argued to level the playing field by having both employers and employees subject to anti-trust laws.[948] Big capital, labor and government threaten the American way of life with "statism," such as that "… resembling the early days of the Mussolini regime in Italy," according to representative McConnell.[949] Although McConnell concedes that a return to "small" business and labor is no longer realistic, he claims a ban on industry-wide bargaining will mitigate the worst effects of concentrated power. This idea does not resonate across parties. For example, representative McConnell proposes that the bill *mitigates* the kind of power concentration characterizing the fascist regime of Italy; representative Smith, also a Republican, declares that the bill *promotes* government power: "And here it should be noted that the course which this act pursues is precisely the same that was followed by Communist Russia, Nazi Germany, and Fascist Italy."[950] Clearly, there is no agreement, even among representatives from the same party, as to whether this bill confers greater powers on government or breaks the power of labor concentration.[951] In a sense, this fact isolates the power of the production argument – it is about production. Rhetoric about fascist or communist regimes is a kind of flourish that cannot break the divisiveness apparent during these congressional debates the idea of big government may be a cross-cutting idea, but there is no agreement regarding *the way in which* big government grows bigger. Without this consensus, the discourse on big government cannot break the impasse.[952] The idea of production can.

Representative Thomas A. Jenkins,[953] for example, laments the failed policies of the New Deal, which he links to the production losses seen in recent years. However, Jenkins believes the legislation on the table goes too far in terms of its restrictions, and he expresses particular concern that the bill covers industry-wide bargaining, which he sees as having benefited the economy and uses the coal industry as an example:

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[948] See, for example, the argument of congressman Charles J. Kersten, a Republican representing Wisconsin (1947-1949), Ibid., pp. 3617-3618
[949] Ibid., p. 3618. Samuel K. McConnell was a Republican representing Pennsylvania (1943-1957).
[950] Ibid., p. 3620. Frederik C. Smith was a Republican representing Ohio (1939-1951).
[951] Representative Henry Cabot Lodge, a Republican representing Massacuhsetts (1937-1944), deeclared the act an "unwarranted" intervention by government. Ibid., p. 3634. The congressman voted in favor of passing the bill – another point in evidence that this issue was not a sufficiently high concern to thwart bill passage.
[952] Representative Ray J. Madden, a Democrat from Indiana (1943-1977), meticulously outlined how the bill would create obtrusive, non-effective government involvement. Ibid., pp. 3638-3639
[953] Thomas A. Jenkins was a Republican representing Ohio (1925-1959).

"When the industry-wide system was adopted it meant that the work around the mines was classified and the wages were agreed upon for the various classifications in accordance with the work done by the various classes. In that way, stability came to the industry and at the same time the employees were better satisfied because they were treated alike in the various mines and there was an incentive for the younger miners to improve their skill and ability to get out of the lower classes into the higher classes where the work was of a higher standard and where the wages were likewise of a higher standard."[954] This passage shows how conflicted members of Congress were regarding industry-wide collective bargaining; there was not even consensus on its effects. For Jenkins – a Republican – an industry-wide wage provides incentives and stability. Efficiency derived from stability and did not vary from mine to mine, but from jobs within the mine. It can, thus, be inferred from the statement made by Jenkins that productivity is a function of job class. And in reality, statistics during that time reflected this assumption: labor productivity was calculated from average wage costs.[955] The technical productivity argument – that some mines are more productive because they are larger and can afford greater capital investments in machinery, or attract more qualified labor – is too complicated to be cross-cutting in this debate. In the end, Jenkins votes for the bill. Given his objections to the bill, it can be inferred that the threat of production losses[956] was more compelling than the idea that multiple contracts with individual companies would be inefficient.[957]

Less surprisingly, democrats in Congress also argued that industry-wide collective bargaining could create social gain. Representative Donohue,[958] for example, suggests that this form of collective action removes wage rates from competitive pressures, which often subjects labor to unscrupulous practices by management: competition through lower wages, rather than through better efficiency, per se. Implicitly, the congressman is arguing that wages are not negotiated through the market on the basis of productivity: employers set wages. The representative further argues that competition should not be based on wages but

[954] Ibid., p. 3625
[955] See chapter 4 for a discussion of wage policy related in terms of average levels. See, also, Davis and Hitch (November, 1949)
[956] The idea and threat from production losses is expressed in numerous ways from both parties. Charles J. Bell, a Democrat (representing Missouri from 1935-1947) pointed to the "tragedy" that occurred in France due to strike activity: the munitions industry was consequently "…paralyzed by the virus of ungodly communism…" in the lead up to WWII, sealing defeat. Ibid., p. 3626
[957] Ibid., p. 3636.
[958] Harold Donohue was a Democrat representing Massachusetts (1947-1974) and voted against the bill.

on managerial efficiency, service and quality standards – process in other words.[959] Inefficiency is here clearly attributed to management, which can survive only by underpaying labor.[960] This notion of productivity is less compelling than one that shows its link to the production of more – such, in any case, can be inferred because it fails to resonate with either party sufficiently well to block policy passage.

In the end analysis, whether or not the shift in discourse from productivity to production can be traced to the fact that productivity failed to deliver on its promises – as evidenced by the widespread strike activity – is difficult to gauge. Certainly, however, the central, neutralizing appeal of generating more from less, at no sacrifice by any one social group, loses potency in a debate centered on lost production days due to labor discontent. As noted by Representative Helen G. Douglas, corporation profits had risen by 34 percent in 1946, prices by 19 percent, and wages only by 14 percent.[961] A more specific charge is leveled by Representative Chat Holifield, who exposes sections of the bill that would render illegal any strike activity linked to increased work loads without additional compensation – a direct assault on the idea that increased output per input would be justly compensated.[962] This point is taken up by representative McCormack,[963] who appeals to the original discourse in its pure form: "The free-enterprise goal of high production and high consumption can best be achieved through mass production of low-cost products, made possible by increasing our industrial efficacy."[964] He then argues that mass consumption is impossible unless workers receive like wages in line with price levels. Collective bargaining, according to McCormack, holds the key to keeping a lid on inflationary pressure.[965] Although inflation, per se, is another boogeyman, whose specter does surface in policy debates throughout the 20th century, it does not have the power to overcome fears of production losses. McCormack's argument thusly fails to persuade congress to rewrite the bill and safeguard collective bargaining. Whether the argument fails because collective bargaining cannot be linked

[959] Ibid., p. 3647
[960] Ibid., p. 3647
[961] Ibid., p. 3651. Douglas, a former actress, was a Democrat representing California (1945-1951); she voted against the bill.
[962] Ibid., p. 3660. Chet Holified was a Democrat representing California (1943-74); he voted against the bill. Voting patterns may *appear* correlated with regions; it is important to note, however, that in California only one of 14 Republicans, Richard Welch (serving from 1926 to 1949), voted against the bill.
[963] John W. McCormack was a Democrat representing Massachusetts (1928-1971); he voted against the bill.
[964] Ibid., p. 3663
[965] Ibid., p. 3663

persuasively to industrial efficiency, or because industrial efficiency, as a discourse, is losing potency, can only be inferred. But, the fact that the standard efficiency argument is conspicuously absent in these debates lends credence to the notion that it is the latter at work.

What was the final outcome? The House passes the bill following these debates, with 308 votes cast in its favor, 107 against, and 17 not voting.[966] At the beginning of the eightieth Congress, Republicans accounted for 246 seats of the House; Democrats, 188; and the American Labor Party, 1.[967] Clearly, the bill resonated with a portion of Democrats (and not all Republican representatives voted for the bill). Do the final votes and party affiliation matter? Not necessarily: labor stoppages brought new legislation to the fore, and the desire to reform the Wagner Act, or legislate to address the problem of work stoppages, was sufficiently strong to overcome divisive interests. The idea of productivity and its promise to promote the collective good, whereby everyone benefits and no one sacrifices, seemingly did not materialize. Nor was production maximization an inevitable outcome, or so it seems – the outcome had to be legislated, and was legislated, despite the myriad of reservations expressed over the bill.

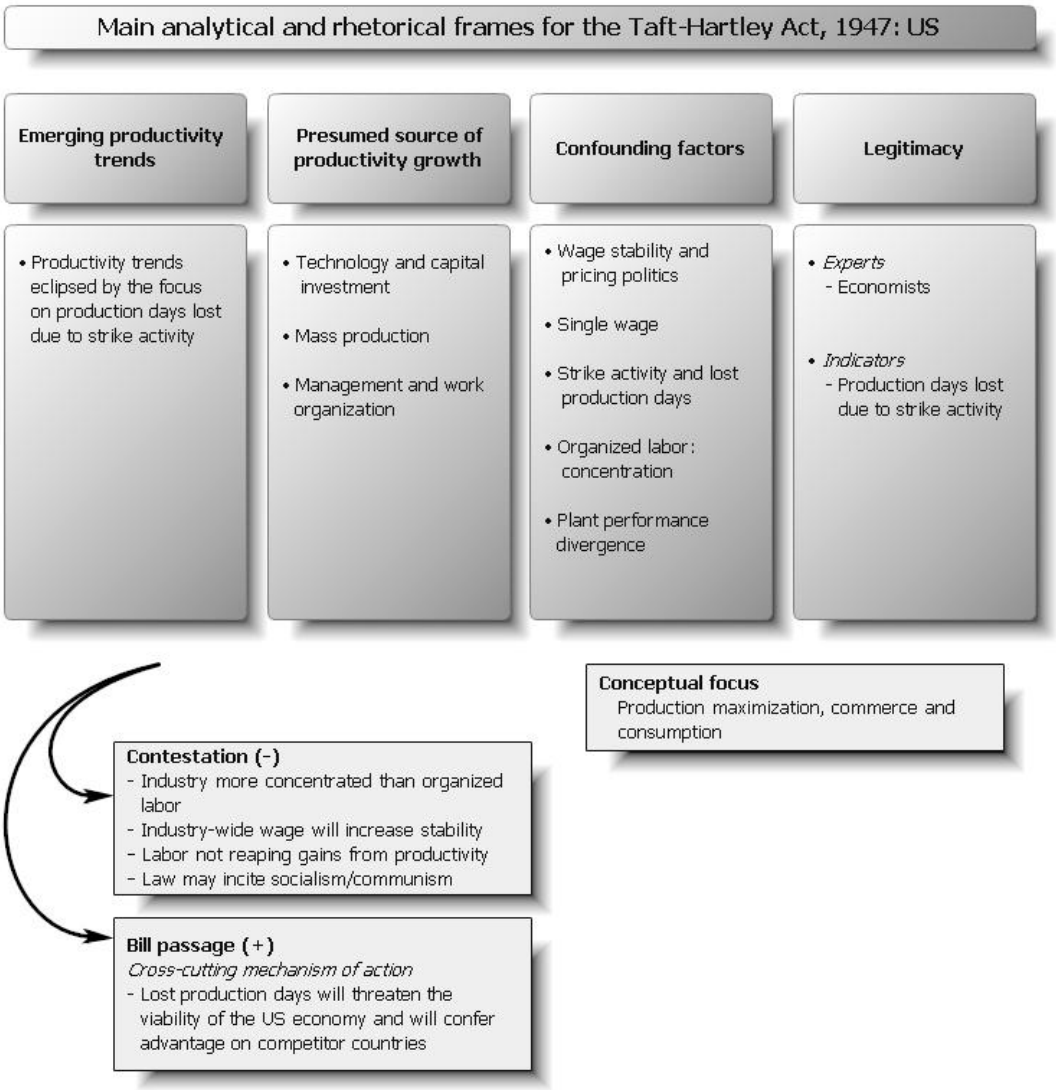
As is well documented, President Truman vetoed the bill, but the veto was overridden. In his address to the House of Representatives, Truman, like many who opposed the bill in the format written, concedes that a solution to labor-management issues is necessary.[968] Truman claims, however, that the bill "… would reverse the basic direction of our national labor policy, inject the Government into private economic affairs on an unprecedented scale, and conflict with important principles of our democratic society."[969] Throughout his message to congress, Truman levels charges that the bill threatens free enterprise and moves the US closer to a managed economy.[970] He further asserts that the divisive nature of the bill may threaten the nation's productivity[971] and spends much of the message detailing the manner in which

[966] Ibid., pp. 3670-3671
[967] Floyd M. Riddick (August 1948), "American Government and Politics: the first session of the eightieth Congress," *The American Political Science Review,* 42:4, p. 677.
[968] United States (1947), Congress. *Labor-Management Relations Act, 1947; Message from the President of the United States,* 80th Congress, 1st Session, June 20, 1947, Washington DC: (no publisher/printer listed), p. 1
[969] Ibid., p. 1
[970] Ibid., p. 2
[971] Ibid., pp. 10-11

workers would be treated inequitably, possibly raising the number of strikes overall, and leaving decisions to be made by "clumsy and cumbersome" government.[972] The arguments failed to convince congress. Scholars have suggested that the message delivered by Truman were too extreme to buy votes,[973] but it may be more plausible to claim that the arguments were too complicated, or too ambiguous to override the fear of production losses. No definition or benchmark could be attached to "clumsy and cumbersome" government, but production losses and man-hour losses come with numbers attached to them.[974] Moreover, there was no agreement among representatives on whether or not the bill would increase government involvement in the affairs of business or labor. In other words, only numbers provided cross-cutting arguments. The fact that Truman's vehement rejection of the bill, largely couched in terms of obtrusive government involvement, did not persuade congress, makes it ever more plausible that production numbers clinched policy passage. Figure 7.4 summarizes the issues key to Taft-Hartley that reflect the productivity discourse at that time.

[972] Ibid., p. 8
[973] Gerard D. Reilly (1960-1961), "The legislative history of the Taft-Hartely Act," *George Washington Law Review,* 29, *HeinOnline,* p. 300
[974] See page 253 for the number of man-days lost estimated by Congressman Dondero.

Figure 7.4



Institutional empowerment and the spread of discourse

Overview. The "idea of productivity" flowed more forcefully and consistently from the United States to France, as would be predicted by discourse analysis and the role in its diffusion played by a dominating

power; however, the way in which discourse influenced institutional structures in each country, not surprisingly, differed. For example, in France, as noted, institutional structures were developed to facilitate exchange programs, helping France to import American managerial ideas. The link between the productivity discourse and the development of institutional structures was, in this case, direct. The various institutions, conferences – all of which were created in the name of productivity – can also be handily linked with the importation of productivity ideas from the US to France. To answer the counterfactual that France would not have developed modernization plans without the diffusion of productivity ideas from the US would be a tentative claim.[975] It can, however, be asserted that these plans were later heavily influenced by American ideas, as argued in the preceding chapter. These institutional structures provided the main conduit through which ideas could be imported and implanted in France. The United States had no official planning commission as in France to articulate economic goals. There were no modernization plans. But there was a watch over the economy. Like in France, progress during the post-war years was measured in terms of growth rate; productivity would deliver the goal. The question to be addressed in this section is whether institutional structures in place influenced the development of the productivity discourse, or did the discourse morph and empower institutions, and what influence might these institutional bodies have had on economic organization?

The outcome of the Employment Act: the CEA and presidential reports. It can be argued that the Employment Act's single most important outcome was to establish institutional frames to oversee the country's economic performance. Specifically, the Employment Act of 1946 signed into law (1) the transmission of an *Economic Report of the President* to Congress at the beginning of each regular session (2) the creation of a *Council of Economic Advisors to the President* and (3) the establishment of a *Joint Committee on the Economic Report.* All three institutional bodies are intended to provide a diagnostic of the economy and recommendations for measures needed to secure the policy objectives outlined in the Employment Act. The CEA, as is known, is composed of three members, with rights to employ needed experts to help them "... analyze and interpret economic developments, to appraise programs and activities

[975] A claim is made in this dissertation, however, that the development of modernization plans was at least partly inspired by New Deal policies in the United States. This point is discussed in chapter 6.

of the government in the light of the policy declared in Section 2, and to formulate and recommend national economic policy to promote employment, production, and purchasing power under free competitive enterprise."[976] The CEA is tasked with five functions:[977]

- To assist and advise the President in the preparation of The Economic Report;
- To gather timely and authoritative information concerning economic developments and economic trends;
- To appraise the various programs and activities of the Federal Government;
- To develop and recommend to the President national economic policies; and
- To make and furnish such studies, reports thereon, and recommendations … as the President may request.

The economic policies referred to in these tasks relate to the achievement of policy, as written in section two of the law. As with the modernization plans in France, the US reports served to provide an overview of the economy and guide policy. The French parliament, from at least the fourth plan, had some say in way the laws were written; in the US, the economic reports could spur policy suggestions, or advice on the part of the CEA – policy measures had to be passed by Congress. To what extent did the *Economic Report of the President* and the advice of CEA help create policy through the weight they held in terms of legitimacy cannot be directly discerned. What can be argued, however, is that these institutional frames, in the very least, provided a conduit through which to continue to legitimize the discourse on productivity, as one example. With these reports having been published and members of CEA appointed, as decreed in the Employment Act, until the present day, its legitimacy can be inferred to be strong and sustaining. If the source is recognized as authoritative, we would expect the productivity discourse to be featured in these documents, as part of the "pattern of activity"[978] that characterizes discourse.

In fact, in Truman's second annual *Economic Report,* he begins by asserting, "The year 1947 has afforded a new demonstration of the tremendous productivity of the United States when our natural resources, our accumulated capital, and our able and enterprising labor force are used at high levels of activity."[979] Later in the text, productivity, defined as output per man-hour, is noted to be "somewhat" higher in 1947,

[976] Ibid., p. 229.
[977] Ibid., p. 230. The functions are here noted in abbreviated form.
[978] This, again, is the definition of discourse adopted for this dissertation, more fully explored in chapter 3.
[979] United States, Council of Economic Advisors (1948), *The Economic Report of the Presidetn as Transmitted to the Congress, January 1948,* New York: Reynal and Hitchcock, p. 1

compared with 1946, with production increases attributed mainly to an increase in capital equipment and employment.[980] The text declares the level of capital per worker to exert the largest influence on productivity. Given the increases in both capital and employment, the net effect on productivity for 1947 is slight, as noted – employment (labor) and capital increase similarly; capital as input is inferred in total product, but its costs are not accounted for in the equation.

Later in the *Report*, the way in which labor becomes more productive, is focused on what makes them *intrinsically* more productive "Even with modern factories, fertile fields, abundant sources of power and raw materials, and smoothly flowing arteries of commerce, the growth of our economy will depend ultimately upon the men and women whose mental and physical energies constitute its greatest wealth."[981] Labor efficiency, then, comes from increased investment in health care and education, for one. The automation of industry requires less physical exertion and more technical training – jobs that are lost in the process can be absorbed by the growing service sector, for which still higher technical skills are needed.[982] Finally, with investments in education and health, the *Report* suggests that individuals produce more efficiently when job security is accorded to the general population: "A national policy of vigorously promoting maximum employment will be the longest step toward the sense of individual security which is conducive to high productivity."[983] Here, we return to the language of the Employment Act – it is a question of promoting maximum employment, not *guaranteeing* full employment as a right. Stability in industry is insufficient to combat conditions brought on by major economic depressions; high productivity comes from averting economic crises. In this case, government action, carefully circumscribed to one of a vaguely worded "promotional" role, is nevertheless legitimized by its result: higher productivity, which means that the cost of the effort will be more than compensated by the production of more, for less. What this text suggests is that, true to the quantitative debate, man is not "given," but has become part of a larger process. Workers can be trained and their efficiency improved – the investment needed to reach this point

[980] Ibid., p. 15. Note that labor productivity continues to be defined as output per man-hour, as a raw measure, in this report.
[981] Ibid., p. 68
[982] Ibid., p. 69
[983] Ibid., p. 72

is not included in the math. In other words, labor can be made to be more productive, but this does not necessarily constitute growth per se, as is alleged by the rhetoric, because the math does not indicate the price paid for the added inputs (training, health care and social security) that may be traced to higher output (or output more efficiently produced). The CEA, then, can be seen to legitimize the discourse, as the discourse, in turn, empowers the CEA.

And, the discourse, through the CEA, spreads over time. With the outbreak of the Korean War in 1950, the *Midyear Economic Report to the President*[984] again avails itself of the productivity discourse. "We must make full use of our great productive resources, our ever-improving industrial and scientific techniques, and our growing labor force. We must redirect a part of these resources to the task of resisting aggression."[985] As noted in a few paragraphs down, productivity is linked, as it was during debates on the Marshall Plan, with "well-being and international security."[986] Fundamental to the attainment of productivity and the ever-expanding source of more, is the notion that the economy must operate at full capacity. If an economy is producing at full capacity, the reasoning goes, then it is "easier" to divert resources from one use to another than to enlist erstwhile unused resources for new purposes. Implicitly, this argument legitimizes the "politics of more,"[987] insofar as it challenges the notion of a "natural" rate of production, whereby needs are satisfied. More secures the future. And, the notion directly contravenes the theories of scholars, such as Albert O. Hirschman, that slack is needed in the system in order to house reserves for use in times of crisis.[988] In fact, the way in which it is "… easier to divert part of the steel which is now being produced to new purposes, than it would be to build the plants required to lift capacity…"[989] should not be taken at face value. Can a steel plant be more efficiently converted into a weapons manufacturing unit than building one from scratch? In the text, it is merely assumed to be the case.

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[984] United States, Council of Economic Advisors (1950), *The Economic Report of the President: transmitted to the Congress, July 1950,* Washington DC: United States Government Printing Office
[985] Ibid., p. 1
[986] Ibid., p. 2
[987] The allusion is to the work by Robert Collins (2000).
[988] See discussion in the literature review for a more detailed explanation of this concept.
[989] Ibid., p. 7

In fact, the argument is covered by the claim that productivity continues to increase: "The amount of the over-all increase cannot yet be statistically computed on a satisfactory basis. Nevertheless, it seems certain that a net increase in productivity is occurring … [which] reinforces the conclusion that, with full utilization of manpower, the total output of the economy can grow considerably in the months ahead without serious strain…."[990] This argument again provides a cover for the production of more; we are not at the limit of our resources, which could strain the economy by applying price pressures on scarce resources pushed to their limit, because we can increase our productivity, thereby easing the pressure. As was clear from the foregoing analysis, the way in which inputs are accounted for is not transparent. Therefore, with an economy at "full production," it does not necessarily follow that added inputs are available to increase productivity – or that resources are available to encourage innovation. This argument does not surface, or at least not prominently, in the policy literature – only later in the academic discourse.[991]

Full production, now needed for the war effort, implies an engaged labor force: "Labor should continue and enlarge its contribution toward increasing productivity, and toward even more effective use of manpower."[992] In this opening statement by Truman, workers are pressed to limit wage demands so as not to encourage inflation and to refrain from industrial action to keep the economy operating at full capacity. Wage increases in and of themselves are not proscribed; only increases that are not linked to productivity. Thus, although the Council of Economic Advisors could merely recommend policy and the *Reports* issued by them did not carry any legal implications or direct consequences, the way in which the institutional framework helped entrench and legitimize the (evolving) productivity discourse during this time cannot be disregarded.

The CEA and its legitimizing role as congressional hearing experts. A second way of tracing organizing effects in the economy to the CEA is simply to analyze Congressional hearings and infer the impact of expert testimony on policy measures implemented. For example, in the hearings conducted before the *Joint*

[990] United States, Council of Economic Advisors (July 1950), p. 55
[991] Capacity issues are explored in chapter 4.
[992] Ibid., p. 13

Committee on the Economic Report in 1951,[993] the role played by the CEA, generally, and particularly its then Chairman, Leon Keyserling,[994] in providing support for wage and price controls is clear. Keyserling, instrumental in the drafting of New Deal legislation, was not averse to economic "planning." Keyserling was careful to qualify his remarks as not in support of "planning" in the "controversial sense."[995] The chairman of the CEA advocated economic policy that looks at the whole of the economy, and not merely its parts.[996] This hearing primarily deals with wartime production and the need to keep production churning. As Keyserling points out, "Great emphasis upon production is valid, whichever assumption you take."[997] According to the Chairman, the best way to ensure production increases is through technology and know-how, or "… to make two blades of grass grow where one grew before."[998] In other words, productivity is key. And, in this particular instance, Keyserling names the US' productivity potential as the key "weapon" in its competition against the Soviets.[999] The fact that productivity resurfaces in the hearings, where it clearly plays a central role (because production is considered to the a point of emphasis, and productivity helps ensure production potential), is noteworthy insofar as the concept continues to wield influence. Policy, for this debate, is not centered on productivity-enhancing measures, per se, but price and wage controls. What is the link?

According to Keyserling, "Wage stabilization does not get away from the fact that wages are one of the devices which the American economy uses to get people to work efficiently and work in the right places."[1000] It is not exactly easy to interpret this statement, but following it, Keyserling suggests that wage levels attract employment levels, and that, in the time of war, these incentives may be directing workers to the "wrong places." Efficiency, in this argument, clearly links with the historical circumstance at hand: war. And markets cannot get to the correct equilibrium in this situation without the help of government. In fact,

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[993] United States (1951), *January 1951 Economic Report of the President,* Joint Committee on the Economic Report, Hearings, January 22, 24, 25, 26, 29, 31, 82nd Congress, First Session, Washington DC: Government Printing Office.
[994] Leon Keyserling (1908-1987) served as Chairman of the Council of Economic Advisors from 1949-1953.
[995] Ibid., p. 2
[996] See, for example, page 2 and 5, Ibid.
[997] Ibid., p. 6
[998] Ibid., p. 7
[999] Ibid., p. 7
[1000] Ibid., p. 12

this argument carries weight. Keyserling argues that free competition cannot work in periods of "mobilization"; therefore controls are needed.[1001]

Curiously, this reasoning is used to legitimize free-market competition. Keyserling assures the congressional committee that price and wage controls demonstrate that the American economy is free, relative to the Soviet economy, which is completely "dictated."[1002] Were we to have a system such as that which characterizes the Soviet system, "… there would be less reliance on the price and wage mechanism of adjustment. But we do not want that kind of system – ours is more efficient and productive."[1003] In this system, price and wage controls are legitimized, not only because they show that in using them, the US is *not* like the Soviets, but also because when government action is called for, such as during war mobilization, government action can lead to an efficient outcome. In other words, the concept of efficiency continues to propel policy forward, in whatever guise.

What constitutes efficiency is ambiguous, however. At one point, Senator Taft points out that wages are normally increased per annum, based on an assumption that productivity will increase by 3-4 percent.[1004] Interestingly, although the Senator concedes that this productivity increase "may or may not" materialize, he appears to be certain that it will *not* take place in a situation of wartime production.[1005] Why not? Senator Taft does not explain. Keyserling, the economist, corrects the politician by explaining that increased productivity *can* occur, but that should it happen, its benefits will not be channeled back to the population in the form of enhanced spending power, because the military would be appropriating the fruits of increased productivity.[1006] In other words, increased productivity is associated with greater spending power and more consumer goods. But the fact that, for the politician, productivity *cannot* occur during wartime production, betrays the fact that technology and efficiency are not so much at play, politically, as what consumers can buy. More importantly, an argument can be made that, because productivity is

[1001] Ibid., p. 8
[1002] Ibid., p. 13
[1003] Ibid., p. 13
[1004] Ibid., p. 19
[1005] Ibid., p. 19. It could be argued, of course, that to accelerate production, ever less "productive" resources must be enlisted in the production process. But, this argument is not made.
[1006] Ibid., p. 20

presumed elusive during wartime production,[1007] government intervention by way of price and wage controls[1008] is justified. Indeed, as noted earlier, price and wage controls reflect "*laissez-faire*" efficiency in times of crisis, because they are limited in terms of government intervention compared with the level of controls that would be applied by totalitarian states in similar circumstances – or, this is the implicit argument being made by Keyserling. The argument is interesting even at a subtler level: efficiency is always relative.

As is well known, price controls were applied during the Korean War (as well as during other episodes in American history).[1009] Did the arguments, largely by economists, delivered during these hearings on the CEA's *Economic Report to the President* lead to wage and price controls? Was this support *causal*? Again, the only way to argue this point is to reason through the question counterfactually. Clearly, the list of experts called to testify were members of the elite economics professions: of the 32 experts called to these hearings, 14 were professors of economics affiliated with prestigious universities – John Kenneth Galbraith[1010] from Harvard being one of them – with the vast majority of the remaining experts also being economists, employed in the capacity of administrators (such as members of the Council of Economic Advisors and the Federal Reserve Board), or economic advisors to various high-profile institutions, such as the Brookings Institution or and the National Industrial Conference Board.[1011] At the very least, it can be inferred that scientific opinion helped legitimize the policy proposal – as Willford King and Harold Metz were argued to have done for the Full Employment Act and Taft-Hartley,[1012] respectively – undoubtedly helping to secure its passage.

[1007] Later in the debates, Martin R. Gainsbrugh, chief economist with the National Industrial Conference Board, suggests that productivity, or output per man-hour did not increase during WWII, only production did. Ibid., p. 287

[1008] Marriner S. Eccles, member of the Federal Reserve Board, provides testimony that price controls are needed for critical goods as part of an effort to combat inflation, which "…causes unrest and dissension among people and thereby weakens our productivity and hence our defense effort." Ibid., p.155. Emphasis added.

[1009] See, for example, Hugh Rockoff (June 1981), "Price and wage controls in four wartime periods," *The Journal of Economic History,* 41:2, pp. 381-401

[1010] Galbraith testifies that price and wage controls are a necessary part of the total strategy to combat inflation. Ibid., pp. 353-355. See link with productivity in footnote 402.

[1011] Experts are listed on the front page of the *LexisNexis Congressional Hearings Digital Collection*.

[1012] In fact, in1959, the then Chairman of the CEA, Raymond J. Saulnier, made a case before the Supreme Court for terminating an industry-wide steel strike (Steelworkers v. United States, 361 US 39 (1959). Saulnier, having earned a PhD in Economics from Columbia University, served as the CEA Chairman from 1956-1961. See full text of case:

Institutional mechanisms: the United States versus France. That the CEA participated in congressional debates more or less implicates this institutional body as exerting organizing effects in the economy. For this dissertation, such a claim begs a counterfactual: would institutional structures, such as the CEA, be in place without the productivity discourse? Insofar as productivity is linked to production and the general welfare of the national economy and insofar as it formed a central unifying concept in the organization of the economy, the claim can be made that the discourse helped validate the creation of these institutions – benchmarks were needed to help elites guide the economy. Institutional structures such as the CEA, together with its economic reports, in turn, helped reproduce the discourse by serving as its key conduit through numbers and the experts they employed.

Can comparisons be made between the advisory role played by the CEA and the French planning system? Like the *Economic Report to the President*, the modernization plans in France served to define policy priorities and map economic goals, known as "indicative planning"; they were not laws, as documented earlier in this chapter. The clear comparison may stop here. Whether or not the relative influence of the CEA and the French modernization plans on economic policy is comparable is an empirical question that will not here be addressed. It is more relevant for the current analysis to acknowledge how critical these two institutional structures were to the delivery of ideas about productivity. In the United States, these institutional structures – through experts serving as witnesses during Congressional hearings and in the reports that documented the general wellbeing of the economy – ideas about productivity could be conveyed and reproduced. In France, the modernization plans served to introduce productivity concepts to government administrators and also provided the benchmarks needed (or constructed) to gauge planning success or failure.

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http://supreme.justia.com/us/361/39/case.html . The example shows the extent to which advisors played important roles in terms of influencing outcomes. In this case, the Supreme Court upheld Taft-Hartley, declaring the strike illegal.

The Bureau of Labor Statistics and NBER. The founding of the BLS is interesting for the fact that its first commissioner, Carroll D. Wright, upheld the belief that better industrial relations could lead to national prosperity and that machines – or modern industry – could liberate both men *and* women by affording them time to develop their intellectual and social standing.[1013] The stance was a precursor to the politicized pitch for productivity that filled Congressional halls during the early postwar years: that is, modernization could provide more or the same outputs with fewer labor inputs, and such would be liberating for the collective population. The idea was predicated on the notion that workers and management shared the same goal. It is interesting to note that efficiency, in this case, was not valued for the higher level of material goods to be made available, but for its promise to afford higher meta-physical achievements.

Shifts in the productivity discourse, and meanings attached to it, affected the organization of the BLS and tended to reflect the social exigencies at hand. For example, by the time of the New Deal, the fifth BLS commissioner, Isador Lubin, described to be a strong advocate of government involvement in economic matters, privileged the statistical documentation of wage earnings and employment patterns, as well as union activities, pricing and production patterns.[1014] With the imminent onset of war, the agency focused on cost-of-living indices, as well as indices for war-associated products – perhaps anticipated deficit spending was predicted to create inflationary pressures. Once published, these statistics became potential policy movers: government, employers and unions all used these indices to determine the "real" effect of wage controls on workers' incomes. To cite one example provided by study authors Goldberg and Moye, a 24 percent rise in the cost-of-living index in the face of a 15 percent wage hike in 1943 initiated debates and demands that cost of living indices be substituted for worker expenditure as a way to assess more accurately a standard of living.[1015]

[1013] Carroll D. Wright (1840-1909) was an American statistician and sociologist, who served in the Massachusetts Senate, as well as authored works on labor relations, wages and prices. At the time of his appointment in 1885, the agency he joined was called the Bureau of Labor, later to become the Bureau of Labor Statistics. See Joseph P. Goldberg and William T. Moye (September 1985), *The First Hundred Years of the Bureau of Labor Statistics,* Washington DC: US Government Printing Office, p. 6
[1014] Ibid., pp. 142-148
[1015] The wage hike was linked to standards held by the Little Steel wage stabilization formula. Ibid., pp/ 154-155.

What is important about this example is simply that wages were not linked automatically to productivity, per se (however defined), but that wages had, in some sense, to be gauged according to what could be purchased. It was a decision to be made by policymakers, not the workings of the market, necessarily. In order to help settle the dispute, then-acting commissioner A. Ford Hinrichs[1016] appointed the NBER economist and professor at Columbia University Frederick C. Mills[1017] to review the cost-of-living index. The authors cite Mills as declaring the index to be "trustworthy" but likely to be enlisted for inappropriate uses.[1018] What this exchange shows is the way in which economists were important in terms of reviewing BLS statistics and methods; they influenced outcome. Recall that Mills was later to become influential in his contributions to the understanding of not only such indices but also their role in productivity measurement as a price deflator. Did Mill's ideas about productivity then become influential in the way productivity statistics were compiled at BLS?

Mills' work showed that gains from labor productivity improvements involve distributional issues conditional to price and wage conditions: who was to benefit from higher efficiencies? Mills demonstrated that the answer was "it depends." Clearly, the way in which debates were centered on wages and costs and/or standard of living indices underscores the notion that policy was centered on distributional issues, and that these concerns translated into wage policies. The fact that Mills' work parallels this discussion at least suggests that ideas were being exchanged and that the ideas influenced policy directions. Were wages presumed to follow productivity trends and were distributional issues not of importance, it is doubtful that controls would have been legitimized and successfully implemented. In this case, the importance played by academic elites – economists from high-profile universities – in producing and shaping the discourse on pricing, wages, and productivity is key. The way in which they operate within institutional structures, such as the BLS, is also a critical element in the mechanics of discourse production and reproduction. The fact that both experts and numbers churned out by BLS played legitimizing roles during Congressional debates

[1016] Hinrichs succeeded Lubin, as acting commissioner. In 1940, Lubin was then appointed economic advisor of Sidney Hillman, who was Head of the Labor Division, National Defense Advisory Commission; shortly thereafter he become the special statistical assistant to President Franklin D. Roosevelt. Ibid., pp. 147-148
[1017] See chapter 4 for a discussion of Mills' work on labor productivity.
[1018] These historical details are described in Goldberg and Moye (September 1985).

further illuminates the way in which players and institutions worked together to generate legislative outcomes.

The BLS, then, was a critical element in the construction of an evolving – or shifting – discourse on productivity. But the productivity discourse, *in turn*, reinforced the institutional power of the BLS by serving up growing mandates. For example, Congress provided the BLS with funds in 1940 to establish a Productivity and Technological Development Division.[1019] As noted earlier, the chief of this division, James Silberman, was a key voice concerning productivity levels in Europe – so much was apparent in the way French documents portrayed his assessment of French production techniques.[1020] More specifically, Silberman was instrumental in developing the Technical Assistance (TA) program aimed at exporting American production techniques.[1021] Between 1948-1957, the TA program was said to spend $60 million on projects, which included study exchanges of Europeans to the United States, the loaning of US technicians for national programs in Europe, as well as a host of additional technical services.[1022] Through these activities, BLS developed trans-Atlantic networks and helped develop the multiple conduits through which exchanges on how to achieve and measure productivity took place.

An additional argument can be made that the nature of the debate surrounding productivity, and the meaning attached to it, legitimized these exchanges. The counterfactual in this case would be to ask the question: would the French have been as enthusiastic to import American ideas, had the discourse simply promoted *laissez-faire* capitalism? From an analysis of the public debates surrounding the European Recovery Program, it was claimed that the idea of productivity helped secure passage of the act. By providing statistical benchmarks, productivity measures aided in framing an exit strategy for the US,

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[1019] Wasser and Dolfman (2005), pp. 44-45.
[1020] See p. 173, chapter 6. This point is also noted in Wasser and Dolfman (2005), pp. 47-48
[1021] In 1948, a memo sent by Secretary of Labor, Maurice Tobin, outlined four goals for the recovery program, including "productivity targets, based on American performance standards, should be included as part of programs to increase productivity." Ibid., p. 49. Here the transfer of ideas and standards from the US to France is clear and meaningful: discourse is an export of the victor.
[1022] Based on the data available, a report by the International Cooperation Administration documents that roughly 19,000 European technical specialists and industry leaders had participated in the study exchange; 15,000 US specialists consulted for national programs in Europe; and thousands of mail and technical literature exchanges were also documented. Ibid., pp. 49-50.

thereby quelling dissent by those concerned about extended and limitless foreign aid.[1023] For French politicians, importing the idea of productivity from the Americans was not only a politically neutral proposition – technology, techniques and ideas that would grow the French economy – but it was also convincing given the US war victory: America was seen as an efficient power.[1024] Given the debates in the French parliament concerning the role of government and contestation (by some) regarding the American system, the importance of this neutralizing argument – efficiency and its measurement – cannot be overstated. Hence, not only was the productivity discourse *productive* in terms of settling disputes at home in America, but it was also a legitimizing force in terms of securing relations across the Atlantic. Statistics provided by BLS may have sped passage of the recovery program, but the recovery program again, *in turn*, helped secure the prestige and power of BLS.

BLS: experts. The BLS provided more than mere statistics to be used during congressional debates. Members of the BLS occasionally served as expert witnesses during congressional hearings. In this case, it cannot be claimed that the productivity discourse on its own generated this role for the BLS. But, the fact that experts from the BLS were summoned for these hearings lends credence to the claim that the role of institutional powers can grow in any one economy, further securing its influence and organizing capability in the economy. For example, just before the passage of the Defense Production Act, Edward W. Hollander, Chief, Price Statistics Division at the BLS is called as an expert witness to discuss the politics of the price index and what it might mean for a price-control policy under discussion.[1025] The exchange between this expert and the Senators participating in this debate is interesting insofar as the BLS expert warns of the power invested in the index as a kind of policy "trigger."[1026] Hollander wishes to drive the point home that "triggers" can be set in motion even when the event, that prompted the action was something completely, "fortuitous."[1027] Hollander, in fact, cites the example of New York transit fares, explaining that the rise in price for this service during the late 1940s would have been sufficiently

[1023] See p. 228, chapter 7.
[1024] This point is discussed at the outset of this chapter.
[1025] See, for example, United States (1950), Senate, Committee on Banking and Currency, *Executive Session,* Hearing, August 4, 1950 (S. 3936), Washington DC: US Government Printing Office, pp. 725-738. This testimony is also discussed in chapter 3.

[1027] Ibid., p. 728

influencing to inflate the price index, thereby calling into question the need to freeze prices. Whether or not the claim is valid, what is important is the fact that an outside expert is urging the Senate to weigh decisions and to factor into the decision-making process the idea that price fluctuations, also components of productivity statistics, can be fortuitous.[1028] Hollander's argument is persuasive: the Senators participating in the debate decide it is better to authorize the President to act, rather than secure in place an automatic adjustment mechanism.[1029]

Is this important? The example is simple and the ruling is not sweeping, but it shows how important institutional authority can be in matters as political as a price index. In this case, the index is used to gauge the necessity of controls, but the index is also used to deflate productivity indexes – the index is implicated in many decisions governing the economy. The exchange shows that decisions are based on discussions among congressmen and experts – equilibrium does not just happen – institutions legitimize the authority of the experts and the lawmakers. The fact that the productivity discourse was integral in developing the influence of the BLS illuminates one way in which this discourse spread its effects in the economy.

In the same way, it cannot be said that the productivity discourse created NBER, but it was influencing in terms of developing and shaping this epistemic community. Solomon Fabricant,[1030] in fact, authored an NBER paper outlining the founding principles and study subjects of NBER.[1031] In this article, Fabricant shows that the NBER was founded in 1920 by a group of intellectuals (and applied statisticians) as a private non-profit organization dedicated to the development of economic concepts and quantitative measures to aid policy.[1032] NBER's first study on national income essentially laid the foundation for the development of national accounts and secured the NBER's reputation.[1033] According to Fabricant, Simon

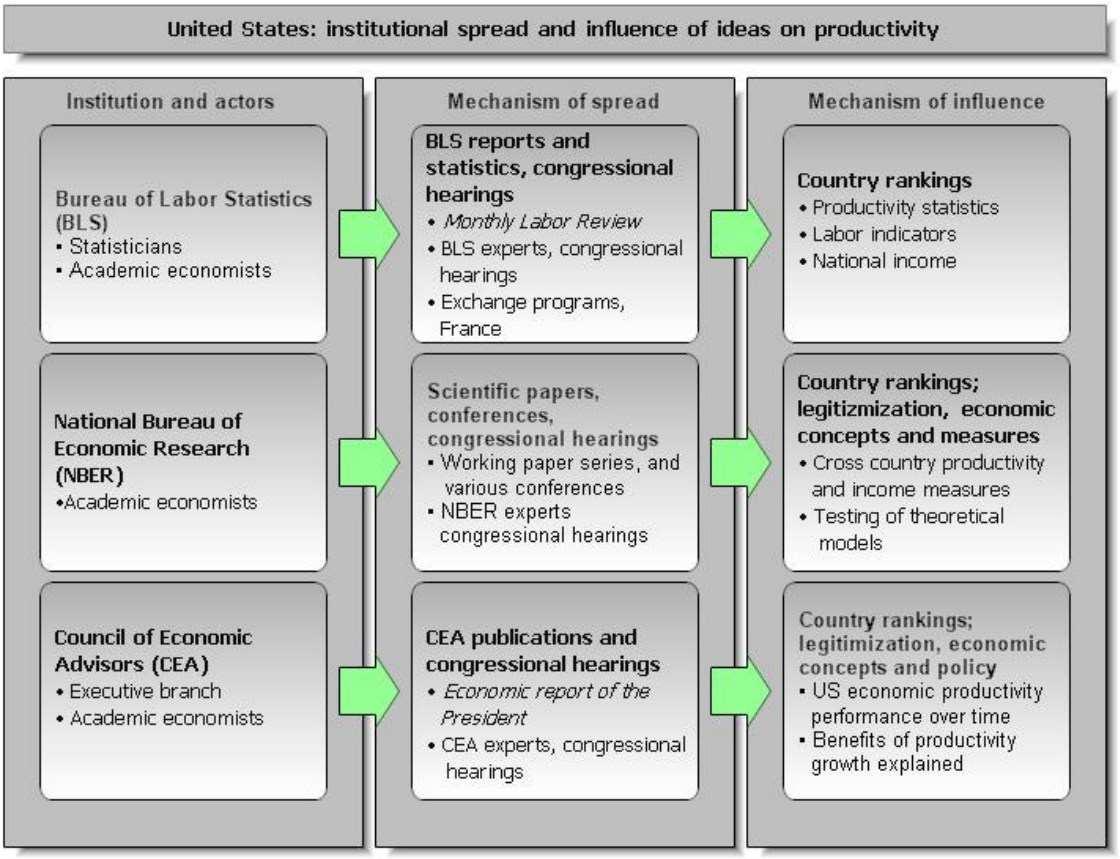
[1028] Senator Paul Douglas, a Democrat representing Illinois from 1949-1967, preferred to call the statistical benchmarks "safety valves," not "triggers," a concern that attest to the political sensitivity of the issue. Ibid., p. 733. Senator Douglas was also a professor of economics at the University of Chicago.
[1029] Ibid., pp. 733-737
[1030] The work of Solomon Fabricant is mentioned in chapter three.
[1031] See the NBER website, http://www.nber.org/info.html, under "History of the NBER." The 1984 article is titled, "Toward a firmer basis of economic policy: the founding of the National Bureau of Economic Research."
[1032] Ibid., pp. 2-7
[1033] Ibid., p. 11

Kuznet's[1034] following work in the 1930s on national income, savings and expenditures represented the next shift in the organization's focus and helped to grow, further still, its influence. Following the completion of these studies, the Department of Commerce requested help from the Bureau to provide estimates for a Senate resolution on national income measures.[1035] The influence of NBER economists in legislative debates, such as King's testimony during debates on the Employment Act of 1945,[1036] is one such example. The importance of NBER in terms of guiding legislation and economic organization can hardly be overstated. Fabricant notes that, at the time of writing the paper, roughly $6 million are spent yearly to support NBER studies carried out in the US and abroad.[1037]

Fabricant indicates that the Bureau first focused on national income and business cycles, and that Frederick Mill's work on the internal structure of the "price system," published in 1927, counted as a landmark "scientific study," whereby data sources collected from the BLS were documented and methods used, described.[1038] Fabricant also refers to NBER studies on the mechanization of labor and its importance to later studies on productivity. In fact, pricing studies (as well as the growth studies by Kuznets) would become important to productivity studies that did not begin to be published until much later as economists began to assume control of the scientific discourse.[1039] It is also noteworthy that the BLS' Productivity and Technological Development Division was created in the 1940s. As ideas about productivity begai to build, "activity" then converges and organizes around the concept. The development of the BLS and NBER during the post-war years provides evidence for this claim. As shown for France during the early postwar years, figure 7.5 illustrates the way in which ideas and institutions helped reproduce the discourse on productivity, as well as created the conduits for ideational change.

[1034] Simon Kuznets (1901-1985) was a Nobel Prize laureate in economics and professor of economics at the Wharton School of the University of Pennsylvania. He is most known for his work on economic growth.
[1035] Ibid., p. 14
[1036] See discussion of the Employment Act, beginning on p. 233.
[1037] Ibid., p. 35
[1038] Ibid., p. 27
[1039] Fabricant notes that one of the founders of NBER was Malcolm C. Rorty had been an engineer and later had become the chief statistician for American Telephone and Telegraphy Company before entertaining the idea of creating an organization that might study the constituent parts of national income. Ibid., p. 2 In fact, plant managers and statisticians form major contributors to the early (1920s-1930s) scientific literature on productivity, as argued in chapter 4. In fact, NBER author Dale Jorgenson claims that the economist George Stigler was the first to introduce the notion of total factor productivity (or "efficiency") in 1947. See Berndt and Triplett (1990).

Figure 7.5



Shifts in the discourse

In the United States, the fact that labor unrest dominated the legislative agenda during the late 1940s could well have foreshadowed that the discourse would have to shift in order to accommodate the reality of growing divisive social interests, as in France. The passage of the Economic Opportunity Act of 1964 – President Lyndon B. Johnson's initiative to eliminate poverty through the promotion of social services – in a backhanded way betrays the discourse's failure to deliver the equitable result promised by the rhetoric of productivity; it had to be legislated. But more fundamentally, in terms of how the discourse was morphing to accommodate a new social context, the American economy was growing and prospering: productivity became linked to greater living standards, exemplified by the accelerated production of goods and services.

The reflexivist research tradition would impel researchers to assess this shift in the social setting to ascertain its effects on the production of new meanings attached to productivity. It would not be counter-intuitive to expect the social meaning of productivity to differ in a setting of growing prosperity, compared with one, where growing labor strength threatened production costs and production levels, generally. Indeed, where efficient, cost-saving production processes defined the dominant discourse during the postwar years (as seen in the scientific literature and public policy debates),[1040] the ways in which the goods produced were *valued* gradually assumed more importance in discussions on the concept of productivity as material wealth grew in evidence, both in the United States and in France.

That productivity began to be seen through material products and their consumer value is clearly indicated in the congressional hearings covering the Stigler Commission in 1961.[1041] This commission was mandated to review possible price indices to be used, such as the consumer price index. Price indices had been integral to the calculation of productivity, as seen in chapter 4; however, with concerns about the market introduction of new products and products with what was perceived to be improved quality, price indices moved center stage in terms of their influence on productivity statistics (because input and output measures

[1040] This conceptualization of productivity is clearly apparent in the popular discourse, as well. See the appendix at the end of this page.
[1041] This commission is discussed already in chapter 4. The commission was formally known as the Price Statistics Review Committee of the NBER. George J. Stigler (1911-1991), a professor at the University of Chicago at the time of the hearing was also Nobel Prize laureate in Economics.

must be deflated by a price index to render *real* values). This notion is best revealed by Stigler himself in his opening remarks to Congress on May 1, 1961: "Finally, consider the industrial system – that complex of companies and products and services which constitutes the largest productive system in all history. Prices guide investment, incite research, govern the choice of raw materials, reflect the pace of innovation – in fact, pervade every aspect of the productive system…Yet we know nothing of the prices of business services, little of capital equipment and construction and inventory prices, and have misgivings on the reliability of prices on large sectors of the product markets."[1042] What is curious to note in this statement is that prices now guide investment, which in turn may translate into productivity growth; previously, the quest for productivity *itself* drove investment – modernization resulted in lower production costs.

In an exchange with Professor Stigler, Senator Douglas[1043] asks how quality change can be incorporated in price indexes in quantitative terms.[1044] To this question, in fact, Stigler refers to a "staff paper" describing how automobile quality differences can be specified by traits, with costs to consumers accordingly applied.[1045] That there is very little agreement about how to quantify quality is apparent in exchanges about the topic during the hearings. At one point, representative Curtis asks whether quality could be measure in terms of "saved time."[1046] Professor Boris Swerling, a member of the Price Statistics Review Committee, responds that, "In a sense, the productivity per man-hour estimates at least are consistent with this route, when one is considering the production side. When one considers the consumption side we don't go at it in these real terms."[1047] In this way, it becomes clear that, once the focus shifts from process to product, the way in which output becomes measured is packed with ambiguity. Consumer valuation obscures the math of productivity, or merely transfigures its social meaning. The shift is clear.

Summary points and relevance for "truth claims"

[1042] United States (1961), Congress, Joint Economic Committee, *Government Price Statistics,* May 1,2,3,4 and 5 1961, 79th Congress, First Session, Washington DC: Government Printing Office, p. 529
[1043] See footnote 961 for a biographical note about Douglas.
[1044] Ibid., p. 533
[1045] Ibid., p. 533. The paper being referred to is clearly the paper by Adelman and Griliches (1961) reviewed in chapter 4; Adelman presents expert testimony during these hearings.
[1046] Ibid., p. 548. Thomas B. Curtis, a Republican, was a representative from Missouri (1951-1969).
[1047] Ibid.,, p. 548. Professor Swerling was an economist from Stanford University.

As in the chapter covering the early postwar discourse on productivity in France, this chapter helps advance arguments being made for this dissertation in several critical ways. The United States is claimed to be the source of ideas about productivity. How these ideas took root in the United States, their relationship to the scientific discourse at the time, and their path of influence help explain the force of their organizing power. The key supporting evidence is summarized as follows:

1. The call to stave off decline and spread of ideas about productivity to different social "locations," namely in policy documents and new institutional configurations. The United States is not war-devastated, as is France, at this time. But the United States is locked in a bi-polar Cold War world and plagued by memories of the Great Depression. In the policy debates about the Marshall Plan, it is clear that productivity is seen as the key assurance against both threats. Productivity will grow markets in Europe and safeguard democracy. That the United States will do the spreading is articulated in these debates clearly; no other country has the productive potential to assume a leadership role, according to US legislators.

But, ideas about productivity are also spreading within the United States. The influence of the scientific discourse on policy debates is evident; debates center on wage cost and production efficiencies. The fact that economic elites, such as Willford I. King (NBER), Hudson Hastings (Yale) and Harold Metz (Brookings), played prominent roles in congressional debates exposes the direct link between elites and policy. Metz, for example, essentially wrote the policy outline for Taft-Hartley and links wages to productivity and congressman Donohue ties productivity to process efficiencies. The language and meaning of productivity has been cinched to production processes and wage cost; these terms dominate the discussion.

From the legislative chambers the discourse spread to policy documents, such as the *Economic Report of the President* to institutional bodies like the Council of Economic Advisors, new conduits of discourse was shaped and shaped the productivity discourse by tracking productivity growth in the United States, promoting its putative source and feeding information (and meaning) back into congress. Institutions that

had already been established, such as the BLS and NBER, adapted and grew their agendas to incorporate the transforming notions of productivity; the BLS was also instrumental in transferring ideas about productivity and its measurement to France, for one. Both institutions provided a pool of experts for congress to draw upon during congressional debates.

2. The rhetoric of productivity moves policy forward. As in France, the idea of productivity worked as a neutralizer of divisive interests, thereby facilitating policy passage. This chapter presents the argument that productivity helped to diffuse conflict by providing benchmarks and an exit strategy for aid to Europe; productivity provided the key to self-reliance and growing markets. The Soviet threat, by contrast, could not be benchmarked, nor clearly countered, and there was no agreement in congress about the effect of aid on this outcome.

In the case of the Employment Act of 1945, the concept of productivity is enlisted to dilute policy by linking government guarantees to work disincentives. King uses a "key ratio" to demonstrate that declining productivity increases average hourly labor costs, which, in turn, decreases employment hours; this argument has traction, it seems, even though increasing productivity is nearly always associated with employment worries (though contested by economists delivering testimony). Still, it is the "right" to employment that attracts the most dissent; rights involve heavy government machinery, the creation of "useless" (read: unproductive) work, and inflationary pressures. Guarantees can also encourage heightened strike activity, placing a brake on production. Productivity, by contrast, is both a by-product and engine of free enterprise. No one is against productivity, not even labor in this case (Green), which equates productivity with progress. The fact that productivity cannot be worked into the equation in support of the bill, as originally drafted, implicates the force of the concept to both ignite and preclude action.

For Taft-Hartley, production days lost to strike activity provide the benchmark, or alert, that unites the lawmakers. In this case, the rhetoric of productivity has ceded territory to raw production, which, it can be argued, is what the end goal had been all along – productivity, and its attendant promise of no opportunity

costs, provided crosscutting rhetoric, for sure. Productivity in the case of the arguments delivered for Taft-Hartley essentially distinguishes between fair wage increases and wage increases based from a "colluding" labor monopoly. The effects of industry collusion on production efficiencies do not, similarly, resonate across the aisle. One reason for the incongruous debate may simply be the way in which productivity was framed at that time, as related to wage costs and not the way in which capital is factored into the equation. Last, it bears noting that the then CEA Chairman, Leon Keyserling, unquestioningly, used a production efficiency argument to legitimize wage controls during the Korean War.

3. Contestation and implications for the rhetoric of productivity. As in France, contestation surfaces in some of the US public debates, indicating that the concept of productivity is either not completely delivering on its promises, or is not fully resonating with all interest groups. For the full employment act, labor (Green) expresses concern that, without employment guarantees, workers will not readily adopt new technologies for fear of displacement. This point contests the idea that productivity will translate either into increased leisure time, or the production of greater amounts of goods and services, either because wages accordingly increase, prompting consumers to demand more, or prices decline, again exerting a positive effect on goods demanded. The point never gains traction; for the most part, even labor (Green, again) equates productivity growth with progress.

More contested is the idea that labor monopolies will harm the economy, but industry concentration will not exert a like negative effect. Labor monopolies, though, can place a break on production, which threatens economic growth. Profits are noted to have accrued to industry at a higher rate and level than wage increases during this era of relative prosperity and stated productivity gains. Still, distributional issues have difficulty gaining currency in an economy that was once besieged by production downturns as those that occurred during the Great Depression. This is an inferred claim, but the text evidence and ultimate vote count suggests that voices appealing to fairness and equity cannot compete with production days lost and other benchmarks that suggest prosperity may be threatened. Threats, as conceived in the theoretical frame of Albert O. Hirschman, bring action to order, not musings about social justice. For Polanyi, rapid growth

and consequent social dislocations *should* activate corrective forces. In this case, either theory fails to explain the outcome, or perhaps the "tipping point" had not been reached.

Most curious in these debates is the lack of consensus regarding an industry-level wage and its relationship to productivity and economic stability; contestation is apparent on both sides of the aisle. But, the arguments are too obscure to move the debate in either direction. Does an industry-level wage provide stability by equalizing labor? Does an industry-level wage, instead, force less efficient producers out of the market? Why is the latter detrimental to an economy bent of securing productivity gains? Others in congress suggested that an industry-level wage protects workers from exploitation; wages are not related to productivity, but are set by management. None of these arguments ring clear, or as clear, as the threat of diminished economic activity. It is the latter that secures the votes, from both parties, needed to pass the bill. Still, the fact that the link between productivity and wage levels cannot be clearly articulated suggests that the discourse is potentially vulnerable.

Arguments centering on government intrusion were, likewise, not crosscutting because "government intrusion" could not be benchmarked and defined. Most compellingly, Truman vetoed the bill, denouncing its probable impact as one that would invite big government to seize control of economic processes; yet, members of both parties successfully overturned the veto. Hence, it can be inferred that government interference was only weakly contested, though it shows that government's role in promoting production and productivity is ambiguous and, thus, exposes the discourse to further contestation.

Last, the fact that the first commissioner of BLS, Carroll Wright, linked productivity gains and prosperity with intellectual liberation suggests that alternative meanings can be attached to gains from productivity; productivity need not deliver a higher standard of level as measured in terms of goods and services. This counterfactual helps illustrate the way in which social meanings are contingent to particular points in history.

Chapter 8: The 1980s-1990s: the productivity of knowledge (overview)

The single greatest challenge facing managers in the developed countries of the world is to raise the productivity of knowledge and service workers. This challenge, which will dominate the management agenda for the next several decades, will ultimately determine the competitive performance of companies. Even more important, it will determine the very fabric of society and the quality of life in every industrialized nation.[1048]

Unless this challenge is met, the developed world will face increasing social tensions, increasing polarization, increasing radicalization, and possibly even class war.[1049]

Peter F. Drucker (1991)

This new economic order … will be a society that might be called "hyperindustrial" – a society in which services are transformed into mass-produced consumer goods … The astonishing new information technologies will unleash formidable leaps in productivity, generating vigorous economic growth for decades to come.[1050]

This new order will not put an end to history. It will not be a utopia, harmonious and placid. Indeed, conflict is more likely now that the Cold War has ended and the market has triumphed. For it is precisely because so much of the world now shares the same desire for choice that conflict will arise.[1051]

Jacques Attali (1990)

Overview: a shift towards ideational notions of productivity

During the postwar years and even well into the prosperous years that followed, Truman and De Gaulle had issued decrees to their respective populations, urging them to maximize their productive efforts and safeguard the future. Several decades later, the legitimizing concept of productivity continued to figure into discussions regarding economic outcome and social wellbeing – productivity growth remains the arbiter of social tension and the provider of hope. That hope, however, was beginning to prove elusive: during the 1970s, rapid productivity growth documented during the postwar years[1052] had slowed significantly.[1053] In response, economists, policy makers and business leaders – across industrialized countries – increasingly

[1048] Peter F. Drucker (1991), "The new productivity challenge," in Brent D. Ruben, ed., (1995), *Quality in Higher Education,* New Brunswick, NJ: Transaction Publishers, p. 37
[1049] Ibid., p. 38
[1050] Jacques Attali (1991), *Millennium: winners and losers in the coming world order,* New York: Times Books (Random House), pp. 10-11
[1051] Ibid., p. 12
[1052] See, for example, Jean Fourastié (1980), *Les Trentes Glorieuses: ou la revolution invisible,* Paris: Cameron and John W. Kendrick (1973), *Postwar Productivity Trends in the United States, 1948-1969,* National Bureau of Economic Research, New York: Columbia University Press.
[1053] See, for example, Zvi Griliches and Jacques Mairesse (1983), "Comparing productivity growth: an exploration of French and US industrial and firm data," *European Economic Review,* 21, pp. 45-81.

sought new ways to address the decline, an outcome that Polanyi and Hirschman might have predicted, and one that reveals the agency required to run a state.

At this time, of course, services had become a more important segment of these economies, generating new discussions about productivity measures and how they may compare across sectors. Do services pose a particular problem for economic measurement? It depends. Services, clearly, can range from simpler work, such as hotel cleaning to more complex tasks, like software development. But manufactured goods can just as easily span from mops to robotics – and the measures of productivity may be as elusive across this spectrum, as that for services. An NBER study conducted in the early 1940s,[1054] for example, revealed that a seemingly simple production process such as that for leather belts could easily grow surprisingly complex as ever more input costs were traced and factored into the equation. Like for manufactured goods, the inputs for services have to be circumscribed and defined; they have to be countable. Attali opined that services would be converted into goods, mass-produced – those countries, which understood this transformation and invested in innovation to achieve this end, would win the future. For Drucker, by contrast, service productivity in developed nations had to rise in order to compete with countries now "making and moving things."[1055] The prophetic distinctions drawn by these two prolific and popular intellectuals may not be important, although it is interesting to note the gulf in terms of *what* will deliver salvation. Social outcome is still allegedly determined by productivity – this despite the slowdown in productivity indicators at that time, something that attests to the sheer persistent potency that these measures represented in terms of gauging economic activity. What has shifted and is acknowledged by both Attali and Drucker is the purportedly new source of productivity growth: knowledge.

Drucker, curiously, describes the key to enhanced productivity in services as working "smarter,"[1056] and his reference model is Frederick Taylor. For Drucker, Taylor was asking the relevant question of how any

[1054] Joel Dean (December 1941), *The Relation of Cost to Output for a Leather Belt Shop,* New York: NBER. See: http://www.nber.org/books/dean41-1
[1055] Drucker (1991), p. 37
[1056] Ibid., p. 40

process could be made more efficient.[1057] According to Drucker, this one question of working smarter is not the sole way to enhance productivity in manufacturing, but it is the *only* way of inciting productivity growth in services and what he labels, "knowledge work." Presumably, productivity growth in manufacturing, in addition to "working smarter," can be achieved by modernizing equipment, or using pumps with interchangeable parts – to provide a more concrete example – as well as better organizing production processes. Are services so different? A bank teller may find a way to process requests more quickly by placing the paperwork in relation to the work station in a slightly different order, but he or she might also achieve productivity gains by switching computer software programs, where – as an example – exchange rates can be more readily accessed, thereby helping to speed the conversion transaction. In a sense, then, if clear lines cannot be drawn between manufactured goods and services – most goods contain services, and services require goods to be completed – and it is agreed that working smarter can enhance efficiency for either, an idea that had been around since the time of Taylorism, then the question becomes: why does the focus of productivity growth shift to knowledge production at this time?

It might simply be that traditionally manufactured goods – cars, refrigerators, and lawnmowers – were failing to deliver hopeful, sustaining productivity statistics, even in the wake of the IT revolution. The failure of a knowledge-intensive good – such as computers – to produce high productivity growth during the 1980s did not deter scholars and policy makers from continuing to champion innovation and knowledge as the key to growth. On the contrary, the productivity paradox, so aptly and famously described by Nobel laureate Robert Solow,[1058] created a pervasive discussion on the part of scholars and social commentators – each proffering interpretations of what could not be explained. The elusiveness of productivity growth instead fueled discussions about how new technologies, such as computers, were adding *latent* efficiencies to the economy, not yet discernable. When productivity statistics did begin to climb in the mid-1990s, for example, many scholars claimed that the numbers reflected the "learning effects"[1059] of using the new

[1057] Ibid., p. 40
[1058] This issue is discussed in chapter 4.
[1059] See, for example, Stephen D. Oliner, Daniel E. Sichel, Jack E. Triplett, and Robert J. Gordon (1994), "Computers and output growth revisited: how big is the puzzle?" *Brookings Papers on Economic Activity, 1994:2,* Washington DC: The Brookings Institution, pp. 273-334

technology. Unlike most products, it was argued that computers required firm re-organization and skills training before efficiency gains could be documented; hence the lag. Thus, it is possible that the new ideational components of product use, coupled with the growing proportion of non-storable, invisible services in the economy, helped shape novel meanings to productivity as well as focused the study of productivity on firm-level data, not industry or national aggregated data. The raw argument in this chapter, however, is that new meanings would not have been materialized had the old ones worked. If productivity growth no longer derived from cost-saving production processes, processes that translated into ever-higher quality consumer goods – then perhaps it could be secured by investing in the development of knowledge-based, high technology products and services.

In his book, *Millennium: winners and losers in the coming world order,* Attali takes this claim in another direction, by suggesting that high technology products would create a new level of personal autonomy, to then liberate individuals form workplaces and institutions, key to enhanced efficiency.[1060] Why has productivity growth not yet materialized? Attali blames recessionary times for obscuring progress in productivity – the ever-confounding factor of consumer demand.[1061] Countries that can produce "liberating" goods, or those that can, more generally, create industries that *sustain consumer demand* will dominate the world economy. These countries "… will be responsible for obtaining or ensuring the creation of technologies that automate production, as well as store and process information."[1062] Accessing information, then, holds the key to individual autonomy in much the same way that washing machines were liberating for those otherwise used to washing clothes by hand.[1063] What is key to understand is that Attali is not talking about enhancing production process efficiency, necessarily; he is talking about production of goods – *products with intellectual or knowledge content* as the new driving force of productivity growth.

[1060] Attali (1991), p. 11
[1061] If neo-classical theory serves as a reference, recessionary times might increase productivity, as less productive resources are let go in the production process, as demand slows.
[1062] Ibid., p. 127
[1063] Ibid., pp. 10-11

America, according to Attali, will not figure as part of this dominating core of powers because the country is mired in debt and cannot compete in these knowledge industries with investment in these technologies lagging (particularly the Pacific region).[1064] Where France once looked to the United States as an exemplar of efficiency, the country's intellectuals now question the basic sustainability of the US economy. Curiously, neither Drucker nor Attali mention China – today's low-cost producer of both high- and low-technology items – as a potential leader in the new world economy. Drucker had predicted that nations "making things" would challenge countries, whose economies were services based – the developed world therefore needed to ensure that services could make us "work smarter." Today, it is not certain that the US service industry is working smarter or that such would help the US win against the "maker of things," China. Nor is it clear that high-tech production has liberated the individual, severing allegiance to institutions, the work place, and country.[1065] The real difficulty with the predictions made is that no outcome to substantiate the claims can be easily measured. In fact, the claims made by Attali and Drucker would seem to be most accurately reflected in trade figures, not productivity, per se.

Conflating productivity with competitiveness

As shown in chapter 4, economists affiliated with prestigious universities in the United States began looking at firm-level productivity in an attempt to discover where presumed productivity gains from IT investment had gone; gains could perhaps be evidenced in disaggregated data. Some of the scholarly work using firm-level data also broadened the performance measures under study, such as profits and market share, rather than exclusively focusing on productivity, per se.[1066] Did economists begin to conflate competitiveness with productivity? Paul Krugman suggests that they did and much to the detriment of the field.[1067] Economists, then, appear to have been at least partly complicit in merging the raw productivity discourse with a discourse on competitiveness, a shift that is amply evidence in the French plans, US legislation and public debates of the 1980s and 1990s. The spread of the discourse to an institutional level

[1064] Ibid., see, for example, pp. 41-45. Note that at the time of editing this chapter, February 29, 2012, Apple was stated to have achieved greater value than Poland. See: http://money.cnn.com/2012/02/29/technology/apple_market_cap/
[1065] See, for example, Attali's chapter on "Nomadic Man," Ibid., pp. 87-113.
[1066] See coverage of the work of Brynjolfsson and Hitt in chapter 4, for example.
[1067] Paul Krugman (March – April 1994), "Competitiveness: a dangerous obsession," *Foreign Affairs,* 73:2, pp. 28-44

is also well exemplified by the numerous government documents, such as the *Report of the President on US Competitiveness.*

In parallel to a general conflation of productivity with competitiveness, high technology indicators began to populate the productivity discourse, a (claimed) direct result of the growing focus on knowledge production as a source of productivity growth. In fact, it has been posited that the Bureau of Labor Statistics and the National Science Foundation provided the criteria for the development of such indicators around this time; the OECD is credited with then helping to disseminate their worldwide spread. [1068] Here, the way in which the US continued to direct discourse and help it proliferate, as claimed by scholars close to the development of such statistics, exposes the ability of elites to shift, redefine, and promote a new, or morphing, discourse as the social context shifts. New indicators could help develop the discourse by providing new benchmarks for needed action and gauges of success.

But, would we expect the productivity discourse to be completely eclipsed by the new indicators and rhetoric just because productivity measures were not delivering? Hardly. Because of its fundamental legitimizing principle – that more can be had for less – productivity would continue to provide social meaning and help, in turn, legitimize the new indicators. In fact, the link between productivity, competitiveness and high technology is quite clearly drawn by the National Science Foundation, which in a 2002 document providing an overview of science and engineering indicators. The agency reports that, "… the country's international economic competitiveness ultimately rests on the capacity of its labor force for innovation and *productivity*.[1069] The agency goes on to claim that, "high-technology industries are also associated with high value-added production, success in foreign markets, and high compensation levels," all of which lead to *higher productivity* and business expansion. [1070] In the concluding paragraph, the report links R&D expenditure to innovation and *increased productivity*, which raises per capita income.[1071]

[1068] Benoît Godin (2004), "The obsession for competitiveness and its impact on statistics: the construction of high-technology indicators," *Research Policy,* 33, p. 1219.
[1069] United States, (2002), National Science Foundation, *Science and Engineering Indicators, 2002*. See: http://www.nsf.gov/statistics/seind02/c0/c0s1.htm, p. O-7. Emphasis added.
[1070] Ibid., p. O-8
[1071] Ibid., p. O-16

Not every economist agrees with these links. Krugman, for one, questions the relationship between high technology and high value-added production, showing, indeed, that value added per worker in cigarette production (1988) reached $488,000, while that documented for electronics totaled $64,000.[1072] Krugman's chief complaint is that prominent economists are not doing the math and that their endorsement of competitiveness, as a principle, can lead to bad policy moves – he points out that MIT economist Lester Thurow, for example, argued for a reduction in the Japanese trade surplus with the US because such had caused a shedding of high-paying manufacturing jobs.[1073] It will be shown in the chapter covering French planning during the 1980s that policy elites there, too, seemed to have foregone the neo-liberal notion that trade is a win-win situation, with a focus on competitiveness helping to revive neo-mercantilism. Does this happen all because of alluring rhetoric? Krugman suggests, "yes."

Krugman would no doubt accept the legitimizing, if dubious, link between competitiveness and productivity, which is surely one of the ways that the productivity discourse morphs and adapts to new historical contexts and continues to exert effect. In fact, Krugman essentially makes this point when he asks, "Even if you know that the benefits of higher productivity have nothing to do with international competition, why not describe this as a policy to enhance competitiveness if you think that it can widen your audience?"[1074] A wider audience does not necessarily equate with more sensible policy measures – this idea can be inferred from Krugman's article.

But, Krugman's focus on competitiveness and its conflation with productivity, should not detract from the more fundamental claim being made in this study that productivity, like competitiveness, is riddled with ambiguities and may potentially – because of its allure and neutralizing effect – lead policymakers to push "bad" policies forward. Or: it may simply prevent elites from fully reasoning through policy decisions because an indicator – productivity – and its link to economic success are taken for granted. Krugman

[1072] Krugman (1994), p. 37
[1073] Ibid., pp. 35-36
[1074] Ibid., p. 44

suggests that "competitiveness" works in this way: "People who believe themselves to be sophisticated about the subject take it for granted that the economic problem facing any modern nation is essentially one of competing markets – that the United States and Japan are competitors in the same sense that Coca-Cola competes with Pepsi – and are unaware that anyone might seriously question that proposition."[1075]

Krugman cites the definition of competitiveness by the then Chairman of the Council of Economic Advisors, Laura D'Andrea, which effectively combines growth in the standard of living and the production of goods and services that can compete in the international marketplace – productivity and trade, then.[1076] Even if countries can be productive without trading – an argument made by Krugman – policymakers nevertheless assume productivity to be critical in improving trade prospects – trade concerns could alter policy and be legitimized by this link with productivity. And although Krugman argues that countries do not compete like companies, cross-country comparisons of productivity levels are common among policy elites, as a way of legitimizing productivity-enhancing policies – much like "competitiveness" comparisons, as though productivity were also a zero-sum game.

Are high technology and knowledge-based products different from ordinary goods?

During the 1980s and 1990s, policymakers considered high technology and knowledge-based products to be the drivers of productivity growth and competitiveness, however conflated. It bears remembering that the scientific discourse, at this time, looked increasingly at technology and R&D investments as the source of productivity growth, perhaps because gains from information technologies appeared elusive; the latter, as has been argued earlier, generated a protracted dialogue among economists and business scholars that stretched well into the 2000s. The transfiguring discourse influenced policy initiatives. The question is: was there a sound basis for legislative initiatives that targeted R&D investments and innovation promotion?

First, what is the link to productivity growth? In an earlier paper by Griliches, it was claimed that the total benefits of R&D investments were difficult to track and no doubt underestimated in productivity

[1075] Ibid., p. 29
[1076] Ibid., pp. 31-32

statistics.[1077] The outcome of investing in R&D, then, is not quite known, but believed to be beneficial; we know that research produces material effects, such as the development of new products. But the real difficulty in answering the question is what the goal of R&D is: product research or process research, or both? Did policymakers during the 1980s and 1990s aim to increase production efficiencies based in high technology, or launch new, high-tech products onto the market?

If new products contain elements of "high technology," and consumers buy them, are we more productive? Are firms more productive? Did cell phones make us more productive? It would depend on how we define productive outcomes: cell phones may help us connect more quickly to another party than through a pay phone, thereby speeding transaction, but does the easy access detract users from engaging in other activities, equally or more productive? Or, are consumers simply switching their product mix? In fact, one issue that is rarely parsed in the public debates covered in this dissertation is whether new technology is needed to make production processes more efficient, or whether new technologies make the development of new goods and services possible, or both. One may enhance productivity, while the other may improve trade balance, or satisfy ordinary consumer wants – the outcome is not the same, though in public debates, outcomes do not appear to be differentiated.

Indeed, before assessing public policy debates for the role to be played by innovation and technology (knowledge) in productivity growth, it may be useful to think about what is actually meant by these terms. Is the development of a computer chip during the last century is any more technologically revolutionary than the invention of the wheel circa 3500 BC, or electricity in the 1880s, or flight, a century ago?
The use of "high-technology" – or knowledge-based goods – as a *new* purveyor of productivity growth in the 1980s and 1990s has constructed sense, but no real, or essential, sense. In the 1980s and 1990s economies produced goods and services, as in any other decade, but the bundle of goods and services demanded were different. Did investment in information technologies allow the economy to produce more of these goods and services with fewer inputs, relative to the previous decade? Productivity measures had

[1077] Griliches (Fall 1988)

difficulty capturing the effect. Washing machines, too, no doubt exerted an enormous effect on household productivity, or the quality of life of those charged with doing the wash – another advance most likely not revealed in official productivity statistics.[1078] And, so, even though technology has long played a role in terms of defining human progress, in the 1980s and 1990s, business scholars, economists, and government elites revived the idea that salvation – as negotiated through the ever elusive productivity surplus – could be found by advancing technology and innovation, as if that idea had never before found currency with philosophers, policy elites, or, even, the population at large.

Evidence that would support claims: the policy discourse in France and the United States during the era of "knowledge production"

Scholars posit different ways in which discourse transfigures over time, or across space. Howarth, for example, describes a play of insiders versus outsiders; the latter renders the dominating discourse at any particular point in time vulnerable.[1079] Clearly, by the time of the French parliamentary debates in the early 1960s, only the Gaullists continued to defend policies pursued in the name of productivity – the promise of collective benefit, from workers to regional authorities in France not well connected to its concentrated center, had not been completely fulfilled; these groups fell outside the discourse frame in the sense that they had been excluded from the distribution of productivity's fruits. Outsiders, not vested in the program outcomes, are free to challenge the discourse.

On the basis of this scenario, we might expect that new political parties in power during the late 1970s and 1980s would promote alternative social meanings of productivity. If it were to be found, on the contrary, that productivity remained linked to prosperity and well-being for all, we would have unearthed further evidence, still, that the concept is politically neutralizing and crossed political divides. We might be tempted to infer that the *idea of productivity* continued to resonate across the social spectrum, but we would want to know how contestation was dealt with in a changing social context.

[1078] Indeed, Robert Lipsey has written about the difficulty of incorporating "convenience" into productivity calculations. See coverage of his work in chapter 4.
[1079] David Howarth (2000), *Discourse,* Buckingham, UK: Open University Press, pp. 8-10.

It is perhaps useful to reconsider the way in which Jackson describes how "patterns of action" – his broad conceptualization of discourse – may influence outcomes throughout time: "The basic analytical bet is that similar patterns of action in different contexts and in different sequences will generate different outcomes."[1080] This frame of reference would lead us to expect that policy initiatives during the 1980s and 1990s, which aimed to promote productivity, would be differently focused than what characterized policy during the early postwar years. Such might help explain the staying power of productivity as a concept: its plasticity helps it evolve with the transforming social environment. Whether the particular mechanism at work is an insider-versus-outsider calculus or some other transformative mechanism is perhaps not as important to document as the extent to which a shift can be discerned in different discourse locations, with parallel changes evidenced in the "discursive elements" of the scientific literature, policy debates and popular press – for example. We would anticipate that a new social context during this later time period in both France and the United States would, indeed, influence the transformation of an older discourse that may be fissuring as a result of new challenges to its legitimacy.

The historical trajectory following the end of World War II bears repeating. At a time when labor was relatively strong in both France and the United States and elites from both countries were urging maximum production, debates centered on labor-saving production processes. As the labor movement began to weaken in the United States, union membership in France was concurrently declining: a peak had been reached in 1947, only thereafter to decline.[1081] During the intermediate postwar years, prosperity grew in both countries.[1082] A claim could be made that a booming economy bringing consumers cash to spend, reworked the notion of productivity, now reflected in a growing bundle of diversified goods and services, not low-cost production processes. A productive society was one that produced countable, diverse, visible goods – this is the main message delivered during the prosperous interim years leading up to the discourse

[1080] Jackson (2006), "Making Sense …", p. 276.
[1081] Professor Gerald Friedman (Professor, Department of Economics, UMass, Amherst) confirmed that labor activity in France experienced a major shift in terms of strike activity in the 1970s – per a phone interview on May 25, 2011. Professor Friedman also noted, however, that union membership does not necessarily reflect labor movement strength in France, where union agreements extend even to non-union workers. But ILO statistics show strike days lost in France in 1971 totaled 4,387,781, declining to 1,522,900 in 1980 and then to 528,000 in 1990. See: http://laborsta.ilo.org/STP/guest
[1082] See, for example, Dan Ben-David and David H. Papell (November 1998), "Slowdowns and meltdowns: postwar growth evidence from 74 countries," *The Review of Economics and Statistics,* 80:4, pp. 561-571

on "high technology." The fact that US congressional hearings and scholarly papers focused their attention on prices indices and new parametric approaches to appraise consumer good qualities, such as the development of hedonic indices, lends support to this interpretation.

But the discourse on productivity during the 1980s and 1990s – how productivity growth could be achieved, by whom and for whom, shifts once again, as noted in the introduction. The shifts are similar in France as in the United States, and not unexpectedly, as the French economy had come under similar strains. Half a decade had past since the end of the *les trentes glorieuses,* new competitors had entered a globalizing economy, Bretton Woods had collapsed and oil shocks served to undermine the confidence of industrialized countries. Despite the age of computers, productivity growth was documented as slowing in most industrialized countries.

If we do premise the analysis on the idea that different social context produce different patterns of [discourse] activity, we would expect some of the emerging economic and social challenges to be factored into a transforming discourse on productivity – in the same way that prosperity during the 1960s may have helped switch the meaning of productivity from cost-savings to goods production.

With productivity declining in both France and the United States, we would anticipate calls for action on the part of both the French and US governments to stave off decline. Elites would continue to play an important role in formulating the way in which productivity growth could be secured, although a compromised [established] discourse on productivity could intuitively provide an opening for new sources of authority to legitimize a transforming productivity discourse; new indicators and sources of economic performance could well figure as part of this transformative process. We would expect the rhetoric on productivity to shift in order to implicitly address the failure of the earlier discourse to secure prosperity and wellbeing for the economy as a whole. For one, with the US lagging in productivity growth compared to emerging high performers, such as Japan, the US would be likely to lose some authority in terms of

advancing the discourse on productivity, ceding ideational territory to the countries posing new competitive threats.

This dissertation explores the force of ideational change. As such, and as argued in previous chapters, ideational concepts of productivity should resonate across space. Challenges to established institutional powers could be contested in public debates; however, with productivity growth levels declining in both France and the United States, *ideas about productivity and how to reverse the downward trend,* should provide the crosscutting rhetoric for change, not the safeguarding of established institutions, per se. The former would be evidenced by an adoption of similar ideas across institutional configurations and the development of *new* institutional powers reflecting ideational changes – in that order. In other words, institutional configuration should not impede the flow of new ideas about productivity and its claimed source of growth. Last, contestation at an ideational level, regarding the meanings attached to the transforming discourse on productivity, as well as the aftereffects of its organizing power, would expose vulnerabilities in the dominating discourse, a feature of discourse and the driver of continual transformation.

Chapter 9: The 1980s-1990s: the productivity of knowledge (France)

France: what theory tells us to anticipate as productivity growth rates slow

When De Gaulle addressed his population in 1961, he spoke to a country that had successfully pulled through war-wrought devastation: the continued production of "more" embodied a clarion call to its citizens. At the launch of France's eighth modernization plan in 1981 – coinciding with the election of François Mitterand as France's fourth President of the Fifth Republic – the call had shifted. At this time, French elites privileged two objectives for the survival of their country: diminished reliance on foreign sources of energy and the development of competitive industries. The latter would be secured by investing in high-technology research.[1083] The word "productivity," ever so pervasive in official French documents following the end of World War II, surfaces in these documents, but it does not drive the discussion to the same degree as seen in the earlier plans. In fact, in the later plans, productivity appears to have been consigned a new role: as a conduit through which *competitive* outcomes would be achieved. Such may have been the implicit meaning of the word featured in the early modernization plans – to grow more rapidly than reference countries, or to grow exports. The difference is simply that productivity, as an *outcome on its own*, was prominently used to gauge economic performance (and direct policies); in the latter plans, national productivity, as an economic indicator – and *rhetorical resource* – begins at this time to vie very seriously with other indicators, such as the competitiveness of firms, measured in terms of market share and profits, among other indicators. Policy initiatives at this time reflect the shift.

This shift does not mean that national aggregate measures of productivity disappear from policy and academic circles: they do not. It is interesting to note that during the oil shock crises of the 1970s, France's productivity figures fared relatively well compared to those documented for the United States. In a paper by Griliches and Mairesse, for example, aggregated total factor productivity growth rates for manufacturing in

[1083] France (1979), *Rapport sur les Principales Options du VIIIe Plan (Project Soumis par le Gouvernment à l'Avis du Conseil Economqiue et Social,* Paris: *La Documentation Français,* (Introduction).

France posted superior results consistently, for the time periods, 1967-78; 1967-73; and 1973-78.[1084] In other words, productivity growth slowdowns had been documented for both countries, but the slowdown in France was less pronounced than in the United States. Whether or not these rates can be legitimately compared, an issue that surfaces in all discussions surrounding cross-country comparisons, is not important to parse here. What is critical to discern, is whether such discrepancies prompted a scholarly discussion about why such differences had been documented. It did.[1085] Scholars had clearly linked slowed performance to the way in which the oil crisis had been managed – the way in which the crisis had been managed, in turn, was traced to institutional structures and energy needs. Ikenberry, for example, claims France and other European countries were more dependent on OPEC oil than the United States, and this helped fashion the policy response.[1086] Whereas the US chose to deregulate the industry, relying on markets to find equilibrium solutions, France pushed policies to heighten national energy self-sufficiency.[1087] The former requires little state intervention, while the latter, a "neo-mercantilist response," involves state planning[1088] – the goal of energy self-sufficiency is exactly what is revealed in France's eighth modernization plan. Was this policy choice inevitable? Institutional structures may have made some policy decisions more likely than others for France and the United States, but there is no evidence to suggest that France *had* to pursue a policy of energy self-sufficiency; it was a choice.

The next question to be asked is whether this discussion about differing productivity rates achieved altered the discourse *about* productivity in France, compared to that in the United States. It did not. In fact, productivity differentials between France and the United States were probably not sufficiently high to attract the attention of policymakers; productivity – growth – had slowed, and this in itself set off an alarm. In France, as in the United States, ideas about how total factor productivity growth was to be jumpstarted were similar. Innovation was key, and firms could help deliver the goal. That is, disparities in the institutional configurations of the two countries did not alter the discussion on the new components of

[1084] The difference between French and US rates were documented at 1.3, 1.0 and .07, respectively – a positive number indicating higher levels in France, compared with the US. Griliches and Mairesse (1983), p. 47
[1085] See, for example, G. John Ikenberry (Winter 1986), "The irony of state strength: comparative responses to the oil shocks in the 1970s," *International Organization,* 40:1, pp. 105-137
[1086] Ibid., p. 107
[1087] Ibid.,, pp. 111-112
[1088] Ibid., p. 112

productivity growth, or the new highlighted role of firms, or even the switch in the rhetoric from productivity proper – clean and simple – to competitiveness, innovation and high technology: ideas floated freely across the Atlantic.

But, given the different responses to the oil crises, we might expect a debate on the role played by institutional structures in productivity growth, competitiveness, or any other rhetorical resource being deployed at the time to drive policy forward. It bears remembering that Griliches had earlier addressed the puzzle of slow productivity growth during the beginning phases of the IT revolution, concluding that the oil crisis could be held responsible. Consumer demand became depressed, as real wealth declined due to energy price increases. Depressed demand was exacerbated as the government attempted to control inflation.[1089] Here, the analysis focuses on consumer demand as it relates to productivity – inflation policy does not necessarily relate to institutional structures.

Subsequent attempts by scholars to explain slowed productivity growth provided innumerable potential hypotheses; Griliches' explanation was but one possibility.[1090] Did theories looking for explanations connect productivity levels to institutional structures? Not really. Even in then newly emerging literature on economic organization, such as the varieties of capitalism literature, the influence of institutional structure on productivity is not a central theme.[1091] In this literature, domestic institutional structures are theorized to confer comparative advantage on types of industries – such would result in particular patterns of specialization. This literature is curiously devoid of links to productivity figures – "profits" and other "performance" measures would appear to be the new outcome measures of interest – in line with what was happening at the level of the scientific discourse and policymaking.[1092] In fact, that a "statist" economy – France – and a "liberal" economy – United States – both make a concerted push for investment in high technology challenges the basic assumptions of the VoC literature. Still, because in both French and US

[1089] Griliches (Fall 1988), p. 249
[1090] See chapter 4 for a discussion of how the "productivity paradox" was explained by different theories.
[1091] The possible relationship between institutional configuration and total factor productivity has, though, been explored in the literature. See, for example, Stefano Scarpetta and Thierry Tressel (2002), "Productivity and Convergence in a Panel of OECD Industries: do regulations and institutions matter? *OECD Economics Department Working Papers,* no. 342, Paris: OECD
[1092] See, for example, Hall and Soskice (2001).

legislative debates, their own institutional structures are championed as the surest way to facilitate productivity growth, we might expect some contestation among policymakers in France regarding the role of the state in this "new" endeavor to secure growth.[1093] Such challenges surface in public debates.

In sum, it is important to bear in mind that institutional structures between the two countries differed, policies in reaction to the oil crises varied, and productivity growth levels diverged. What matched between the two countries were the *ideas* about how to grow their economies, face new competition and secure a higher standard of living for their respective populations – productivity receives mention in these endeavors, but not exactly explicitly (at least not in the French documents reviewed). It is nearly an implicit assumption that new technologies – particularly information technologies – are key to productivity growth. The scholarly literature was making the same assumptions; the productivity paradox, or fact that the effects of information technologies were not discernable in productivity measures, would otherwise not have been puzzling to the scores of economists, who for so long attempted to solve the paradox without ever reaching a consensus on the answer.

The eighth, interim and ninth French modernization plans

Whereas the first modernization plans privileged productivity growth as one of its most important goals, ***the eighth plan***, covering 1981-1985, begins by alerting French policymakers and the population at large that the country's dependence on foreign energy sources threatened its survival, and the choice was clear: "adaptation or ruin."[1094] The words of peril, once again, serve to legitimize policy. France must mobilize resources to produce its own energy supplies to contend with new threat from oil exporting countries.[1095] But the plan also paints an alarmist picture of how geo-politics have changed, serving up further challenges for the French economy. Not only is the global economy welcoming new competitive entrants, such as countries in southeast Asia, but the country also must contend with the established competition: the United

[1093] In the French parliamentary debates of the 1960s, for example, several references are made to the merits of France's particular indicative planning system, while in the US congressional hearings, references to the productive benefits of its *laissez-faire* principles are many.
[1094] France (1979), p. 5
[1095] Ibid., p. 10

States, Germany and Japan. Competition between these countries is particularly heightened because of "unremitting innovation."[1096] The plan states that research and innovation will be concentrated in a few countries, citing that both Germany and Japan have increased their research budgets over the past three years by 30 percent.[1097] It is curious to note that French authorities, at this time, view the Soviet Union and the United States as relatively fixed in their positions. The jockeying for positions is taking place among others countries, such as France and other mid-sized countries, which are trying to maintain their alignment through innovation and new technologies. In particular, information technologies are singled out as key to the development of a new mode of production, helping to reconcile economic efficacy with developing aspirations – to attain more than what is had at present.[1098]

Is this productivity? The assumption being made is that new technologies – particularly information technologies – will safeguard the future by keeping France competitive and able to aspire to new modes of production; higher standards of living, however defined, can thereby be achieved. This *is* the discourse of productivity. The conduit has shifted: from labor and manufacturing processes to invention and ideas. The shift in policy follows the shift in the scientific discourse and all the efforts that were being made to unravel the productivity paradox during the IT revolution. But the idea stays the same: something that transports us beyond our current constraints.[1099]

The way in which the discourse has shifted can be just as well discerned by analyzing what is not communicated in the eighth plan. What is so obviously missing in this plan is a call to workers to step up to the plate and refrain from striking, as had been done in the early postwar plans by asserting that the collective whole would gain by sacrificing and working more productively. In this plan, on the contrary, the French working force is commended for having achieved and maintained a high level of productivity

[1096] Ibid., p. 10
[1097] Ibid., p. 10
[1098] Ibid., p. 13
[1099] The issue of transcendence and its importance as a "material need" of human nature is discussed in Wendt (1999), pp. 131-132. See chapter one for a fuller discussion of this concept and how it could be discerned to relate to the productivity discourse.

growth – the surest gauge of steady progress.[1100] So, here again, the text – or in this case, the absence of text – helps us to understand that productivity has taken on new social meaning; the focus is off labor and directed towards innovation. Growth, through innovation, generates employment needed to sustain the economy. Is this because the level of average worker productivity has achieved a satisfactory level?

It could be argued that the war-devastated economy had greater need of production – of raw goods – simple enough. Workers were needed to step up their efforts to replenish an emaciated economy; under-utilized capacity had to be filled. In fact, French planners articulated a more complex reason for the switch to innovation: the nature of progress – another word for the productivity surplus or residual – had been transformed. Whereas previously advances were made through limited "axes," that enabled the discovery, for example, of new products, progress for the late 1970s and early 1980s had acquired a more general presence. Progress was reflected not only in new products, but also the way in which these products were conceived, manufactured and adapted to infinitely diverse demands.[1101] Productivity had achieved a more ideational and intellectual "essence." Planners thereafter assert that what is scarce is not material product, but the *logic* needed to create such products.

Importantly, only few countries will master this new component of progress, or productive surplus. Planners point out that France lies just behind the United States and in front of Japan in terms of information services and know-how. Again, what is scare and precious is not the capability to manufacture constituent parts of a high quality, per se, but the intellectual capacity to adapt these services to precise needs.[1102] Stated otherwise, logic trumps material as a primary resource.[1103] For the French, mastering this know-how represents the country's third major challenge, created by the 1973-74 oil shocks, the first being post-war reconstruction and the second, entry into the Common Market. Each breakpoint in the country's

[1100] France (1979), p. 13
[1101] Ibid., p. 15
[1102] Ibid., p. 15
[1103] Ibid., p. 15

history has challenged France to progress and "live better."[1104] For at least two of those breakpoints, production – or changing the manner of production – is key to overcoming the challenge.

Once the new territory had been defined, the French planning commission laid out the prescription to meet its goals. In fact, the commission outlined six areas of importance:[1105]

- Reduction in dependence on energy and raw materials
- Develop competitive industries
- Strengthen agricultural sector and food industry
- Strengthen employment policies
- Develop social safety networks for families
- Improve the general living environment

As noted, the crisis, or challenge at the time, stems from the oil shocks of 1973-74, which is why, presumably, the plan privileges self-sufficiency in energy as its first goal. Productivity measures play into this scenario because they had allegedly become depressed due to the oil shock. Next comes the development of a competitive industry in the face of the so-called new geo-political "situation," largely framed in terms of new competitors entering the globalizing economy. Prescriptions outlined to address this particular goal involve a mix of measures, the development of incentives to innovate, being one of them. In effect, many of the other measures link to innovation, as industry is considered to be the main engine of economic growth and achievement of higher living standards, precisely because of its ability to invent.[1106] Industry is the main supporter of new technologies, which lead to these outcomes – productivity growth – a benefit – has worked to diminish some employment opportunities – a loss. But planners counter that such a fact should encourage industry to do more in terms of creating new jobs.[1107] Innovation is certainly assumed to help spur productivity growth. It must also create (presumably) new products and/or industries that can replace lost jobs, a conundrum long associated with productivity growth.[1108] In fact, French

[1104] Ibid., pp. 25-26
[1105] Ibid., p. 49
[1106] Ibid., p. 56
[1107] Ibid., pp. 56-57
[1108] The promise of productivity to shorten the workweek in France – evident in the early postwar modernization plans – proved elusive. The 35-hour workweek was not approved until 2000, with the law to be repealed already in 2005. http://www.msnbc.msn.com/id/7265807/ns/business-world_business/t/french-bid-au-revoir--hour-workweek/

planners suggest that unions are essentially on board with the idea of promoting innovation, but note that care must be taken to help them understand how employment levels will be secured, as a result.[1109] Making this connection between innovation and threat to employment provides evidence that innovation is largely equated with productivity, or the growth, thereof.

One way for this goal to be achieved, according to the prescriptions cited, is to help "develop" the role played by consumers in the national economy. In particular, French authorities press the need to promote the quality of French technology to consumers – claimed to be underestimated by French consumers, who are opting to pay a higher price for the same product made by foreign competitors.[1110] And so: technology not only holds the presumed key to productivity growth by making work organization more efficient, it also creates a new set of product mixes demanded by consumers, and firms must compete to provide these goods. This passage makes clear the key role attributed to demand.

Many of the prescriptions presented in this section are clearly oriented towards firms. This orientation represents a shift from the early postwar years, when calls to action targeted the nation as a whole or industry, more generally. Prescriptions in this plan directed to firms – *des enterprises* – for example, call for incentives to help finance firm expansion. The rational was that firm profits in France were judged to have been mediocre compared to "some of our European partners" during the period 1966-1976.[1111] The focus on firms represents a shift. Previously, calls had been made to promote industry consolidation – in steel, for example – as a way to improve productivity levels. In this plan, interestingly, French planners call for policies that encourage the development of small and medium-size firms.[1112] And, the rational is to make them more competitive. Here firms are urged to invest in innovative technologies, not only to become more productive, but also to become more profitable. This shift in policy orientation squares with that observed in the scientific discourse at this time. Scholars began increasingly observing micro-processes of firms and working with disaggregated data. The claim being made in this study is that the switch can be

[1109] France (1979), p. 59
[1110] Ibid., p. 62
[1111] Ibid., p. 58
[1112] Ibid., p. 58

linked to the productivity paradox and the difficulty economists were having in explaining the elusiveness of productivity growth during the IT revolution.[1113]

That firms moved front and center in discussions about productivity is supported by that fact that the *Commissariat Général du Plan* had commissioned the Boston Consulting Group to help them develop preparations for the eighth plan. In 1973, the American Bruce Henderson founded the Boston Consulting Group, which famously specializes in business strategy. Although the report[1114] addresses competitiveness on both the national and firm level, the privileging of the latter, at least for France, is clear in the conclusion drawn that, "In a way, the competitiveness of a country, small in size and without natural resources, derives from the competitiveness of its firms."[1115] Is France small and without natural resources? Yes, relative to the United States. The report also signals a switch regarding the types of experts gaining legitimacy in the discourse on productivity, when it claims that economists concentrate their analysis on the macroeconomic aspects of competitiveness, while it remains important to study microeconomic mechanisms[1116] – alluding, no doubt, to the emerging influence of business consultants in the debate – new experts are becoming authorized to speak about productivity and competitiveness.

Curiously, the report begins with the sentence that "Improvement in a country's standard of living depends on its resources and its productivity."[1117] The report then goes on to declare that only in autarky is the absolute level of productivity important; for countries engaged in international competition, it is the relative level of productivity that matters.[1118] And, in fact, the report points out that newly industrializing countries are experiencing rapidly advancing productivity rates, due in part to economies of scale, technology

[1113] In fact, many scholars themselves make the claim that they are trying to solve the "puzzle" by looking at firm-level disaggregated data. See, for example, Oliner et al (1994).
[1114] Boston Consulting Group (1980), *Les Mechanisms Fondamentaux de la Compétitivité: Etude Réalisée à la Demande du Commissariat Général du Plan pour la Préparation du VIIIe Plan,* Suresnes, France: *Editions Hommes et Techniques*
[1115] Ibid., p. 70
[1116] Ibid., p. 23
[1117] Ibid., p. 9
[1118] See chapter 8 for a more detailed discussion on the conflation between the concepts, "productivity" and "competitiveness."

transfers, and the like.[1119]The report attempts to disabuse readers of the notion that service-oriented industrial countries need lag in productivity levels compared to countries involved primarily in manufacturing industries. For example, the report suggests that France, has a relatively low portion of its economy devoted to services, compared with other industrialized countries, and that many services can experience productivity increases, such as banking.[1120] Unlike in the eighth plan, itself, references to productivity in this report, written under the guidance of an American consulting firm, are fairly abundant. It is not clear, though it would be interesting to understand, why the word virtually disappears in the French plan – but, as argued, the sense of productivity, its link to the standard of living, the provider of a competitive edge and hope for growth are clearly articulated in the plan, mainly through the use of the word, "innovation." In fact, in the concluding paragraph, the report advises firms to better invest and innovate if they want to be competitive.

At the end of the day, it is not altogether clear which concept produces what outcome. The report suggests that the three key elements of a firm's competitiveness are prices, costs and profits. Costs, for example, can be lowered either through (1) economies of scale, which justify productivity investments and permit specialization (2) "proper" professional training, which affects "work productivity" or that which improves systems and concepts and (3) innovation, which is different from professional training in that it involves concentrated research in a specialized area[1121] (presumably, costs are lowered through productivity gains thereby achieved). From this, it is clear that productivity is no longer the end in and of itself. It is a means to an end, competitiveness. But, the concepts are so clearly inter-related it is difficult to prioritize the goal: is it to increase productivity, innovation or competitiveness?"[1122] From the guide produced, it would appear that firms should simply do their best to cut costs.

[1119] Ibid., p. 9
[1120] Ibid., p. 16
[1121] Ibid., pp. 41-43
[1122] The way in which concepts such as innovation, high-technology, and knowledge industries are related to productivity is discussed elsewhere in this chapter – scholars have addressed this conflation, and their work is noted.

When the Socialists came to power, the eighth plan was discarded and a new one was drafted to cover 1982-1984. ***This interim plan*** – grounded in expansionary policies to counter stagnation – was later reassessed and austerity measures were instead introduced in 1983.[1123] It is, however, interesting to analyze an interim report on technology[1124] drafted by the new government to see if shifts in political power produced parallel shifts in the way technology and innovation were cast. It did not essentially change the discourse about technology, per se, but the interim report does appear to stress state support of research, as well as the important role in research development to be played by nationalized industries.[1125] Whether or not this represents a response to some criticisms leveled at the earlier plan by labor unions, for example, cannot be determined. It is essentially more important to note that technology remains the key link to survival in the international market, in this interim report written under a socialist government, as in the eighth plan, drafted by the center-right government of Giscard d'Estaing.

Noting that the government has chosen R&D investment as the main goal of the interim plan, the study group authors propose to expand government spending on R&D as a percentage of GDP to 2.5 percent by 1985, representing a 60 percent increase from current spending levels. [1126] The study is very clear about its main concern: France has fallen to fifth place, behind the US, UK, Germany and Japan in terms of its spending on R&D relative to GDP. This deficit – the lack of state support for research – has not been compensated by efforts from firms to invest in R&D – as a percentage of GDP, again France lags behind the US, Germany and Japan.[1127] Only 1,300 firms in France have documented an "interest" in R&D.[1128] France's competitiveness and growth depends on the country's ability to invent – full stop.[1129] What is important to note is that benchmarks – such as what was noted for productivity levels and growth – are relevant only to the extent that they can be compared with those of other competing countries. It is

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[1123] See, for example: http://www.nationsencyclopedia.com/Europe/France-ECONOMIC-DEVELOPMENT.html#b

[1124] France (1981), *Commissariat Général du Plan (Délégation Général de la Recherche Scientifique et Technique), Redressment de la Recherche et de la Technologie, Plan Interimaire, 1982-1983, Paris: La Documentation Française*
This plan was supposed to be presented to parliament in April 1982 (see p. 5)
[1125] Ibid., see the introduction, for example, pp. 17-24
[1126] Ibid., p. 13
[1127] Ibid., pp.17-20
[1128] Ibid., p. 22
[1129] Ibid., p. 21

competition all the way down, and following what other countries are doing.[1130] It is also interesting to note that, contrary to the advice provided by the *Conseil Economique and Social,* the interim plan for technological development stresses the need to privilege particular industry sectors in order to maintain international competitiveness.[1131]

The competitiveness of firms weighs heavily in this report, like in the eighth plan, and the study authors propose that firm-led R&D efforts nearly double by 1985.[1132] One would be hard-pressed to discern a difference in the aims and language used in this interim report, apart from the aforementioned focus on nationalized industry and its role in economic development – but it may be window dressing, in any event. In the report, the study group proposes that state aid for industry must be complemented by private funds generated by the firms themselves.[1133] What does innovation do for firms? For one, they generate exports. The study group claims that small- and medium-sized companies that have a "research budget" trace 25 percent of their revenues to exports, a figure that drops to 15 percent for other companies in this category without an R&D budget.[1134] In fact, the study group lists ten propositions to help generate research at the firm level,[1135] most of which involve some level of coordination between the state and firms to diffuse a "norm" of technology development, as well as direct state aid to assist in this diffusion.

In ***the ninth plan***, Prime Minister Pierre Mauroy[1136] articulates the goal of first order (curiously) to be: modernize and train.[1137] The prime minister declares that modernization is necessary to face international competition, an effort that will require resolve and the mobilization of the collective whole – a message of unity in the time of crises and needed effort, much like that delivered during the early postwar years to accelerate production and productivity levels. In the introduction, planners urge the need for economic

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[1130] Ibid., p. 23
[1131] Ibid., p. 24, See below under "Discourse contestation" for a more in depth discussion about the council's report.
[1132] Ibid., p. 81
[1133] Ibid., p. 83
[1134] Ibid., p. 83
[1135] Ibid., pp. 81-82
[1136] Pierre Mauroy is a member of the Socialist Party in France, serving as Primer Minister under Mitterand from 1981-1984. For bios of the members of the French National Assembly, see: www.assemblee-nationale.fr
[1137] France (1983), *9e Plan de Développement Economique Social et Cultural, 1984-1988; Rapport Annexé à la Première Loi de Plan, Tome 1: Les choix du 9e Plan,* Paris: *Direction des Journaux Officiels*, p. III

transformation and "progress" to ensure employment, as well as a dignified standard of living for each individual. Progress, it is repeated depends first and foremost on the modernization of France, which depends on industrial investment, research and training.[1138] Why this slight switch to "modernization"? French planners point out that the county has made strides in terms of developing nuclear energy, transportation technologies and telecommunications. Planners believe that the weakening of France's "competitive" position has declined because "productive investment" for other industries has slowed since the 1974 crisis.[1139] In this plan written during the time of a quickly developing European Union, French planners note the *primordial* need to maintain national independence. The first way to ensure independence is through equilibrium in the balance of payments. The latter is first and foremost to be achieved through the modernization of productive sectors.[1140] Investment, innovation, modernization – each, however defined – is not needed to achieve more for less and fill a war-devastated economy, but it is needed to compete internationally. Is this productivity? Yes, if by lowering costs, productivity places French industry in a more competitive position internationally. Productivity continues to be used as the "rescue" but the outcome – competitiveness – is elusive, as it may be achieved through a myriad of measures, including devaluation and wage control.

In the second plan volume, where strategies are outlined, the modernization of industry and transformation of productive sectors is considered to be the "*grande action n°. 1.*"[1141] The reason: because the modernization of industry produces the rapid growth necessary for employment creation. Priority is accorded to efforts that create a higher level of competitiveness in areas that are set to enhance France's industrial market position, at home and internationally.[1142] Firms are positioned favorably to benefit from these efforts.[1143] Hence, in this introductory statement of strategy outlined in the ninth plan, the language of discourse has shifted, but the strategy is legitimized in much the same way as earlier during the postwar years. Action to modernize will produce growth, securing employment and the well being of the nation.

[1138] Ibid., p. 1
[1139] Ibid., p. 2
[1140] Ibid., pp. 4-5
[1141] France (1983), *9e Plan de Développement Economique Social et Cultural, 1984-1988; Rapport Annexé à la Première Loi de Plan, Tome 2: La Stratégie et les Grandes Actions,* Paris: *Direction des Journaux Officiels*, p. 143
[1142] Ibid., p. 143
[1143] Ibid., p. 143

Productivity enhancement is linked to competitiveness, measured, here, in terms of exports, or France's industrial market share. Innovation not only produces new products demanded on world markets, but also produces the component parts to modernize traditional industries, or make them more productive. Calls to modernize industry and create efficiencies were similar during the postwar years – the focus, now, is on firms, as opposed to industries in the aggregate, and such undoubtedly counts as one of the key differences in the shifting discourse. In the ninth plan, officials claim that, "A large part of productivity and quality gains obtained by firms originate in the development of services that generate strategy, innovation implementation, better production organization, rationalized administration and management, improved stockpiling and information circulation – as well as, more generally, economies of scale and a better allocation of the factors of production."[1144] Planners claim that French firms lag their competitors in each of these areas. The future of French firms – their reorganization and subsequent survival – depends on *immaterial* investments, adapted to the particular needs of individual firms. Such will guarantee their *competitiveness and efficiency*. Information technologies hold the key.[1145] Clearly, France's ultimate competitiveness no longer derives primarily from large macro-economic policy – whatever produces aggregate national productivity – but from what individual firms do to adapt to each particular situation to become more efficient and competitive. Services, in particular, are considered critical to the loosening of external constraints because they play a role in opening new markets, consolidating existing economic relations, limiting imports and managing the supply of commodities.[1146] These services will augment firm competitiveness.

Much of the remaining report is devoted to measures that help integrate new technologies in the economy, whether that is development of the electronics industry or facilitating dialogue between producers and users.[1147] Previously, dialogue was urged between workers and management to create a shared understanding about the need to produce at full volume; during the 1980s, dialogue was now pressing between inventers and users – to aid production processes now more complex and in need to rapid flexible

[1144] Ibid., p. 149
[1145] Ibid., p. 149
[1146] Ibid., p. 149
[1147] Ibid., p. 153 -155.

changes. Do the measures reflect the fact that technology – pure and simple – has delivered new conditions to which the market is automatically adjusting? It could be so argued. What is less intuitive is the idea how outcomes now become conflated. Modernization, competitiveness, innovation, high technology, and productivity are sometimes used interchangeably. The eighth and ninth plans both share these mixed conceptualizations. The outcome is elusive and there are multiple ways of measuring it. Productivity, as an idea – as transcendence – still does its work as a legitimizing goal, even if productivity, per se, is not what is driving policy. It seems likely that "international market share" provides as much, if not more, motivation for the policies at hand. Even if productivity is not mere rhetoric, but a material conduit for international competitiveness, the link is complex. International competitiveness can be obtained through monopolistic powers, exchange-rate policies, advertising power and more. French planners do not make the linkages clear; they deploy the rhetoric of productivity and competitiveness together, as though link were to be taken for granted.

In a report drafted by OFTA *(Observatoire Français des Techniques Avancées*),[1148] four objectives are outlined:[1149]

- Evaluate principle economic sectors and France's positions vis-à-vis technological development;
- For each industrial sector, identify the technologies, which will become important in the 1990s;
- Analyze the transformations linked to these technological developments and associate issues; and
- Propose measures to meet these challenges

The report also selects technologies to be privileged – software development capacities rank first.[1150] OFTA insists economic reorganization is needed to encourage development of technology industries, thereby securing: (1) national independence (2) economic growth, employment and balance of payments (3) work conditions and quality of life.[1151] These issues are similar to those that legitimized actions to enhance productivity levels in France – here the mechanism switches to technology. Once again, the question has to be asked: did the discourse on productivity break, or shift, or is this part of the same discourse, with

[1148] France (June 1983), *Commissariat Général du Plan,* "*Les enjeux technologiques des années 1985-1990,*" *Cahiers d'Etudes et de Recherches," Etude realize par l'Observatoire Français des Techniques Avancées (pour le Commissariat Général du Plan sand le cadre des Travaux Préparatories au 9e Plan),* Paris: *La Documentation Française*
[1149] Ibid., p. 11
[1150] Ibid., p. 12
[1151] Ibid., p. 21

different wording? Clearly, the fact that French planners are now citing new outcomes and measures to gauge success means that economic activities, whether that be institutional development, financial incentives or macroeconomic policy, (theoretically) would be adjusted in ways thought amenable to enhancing these outcomes. It is possible that during the post-war years, the key focus on productivity – raw productivity – no doubt privileged *processes* (what could produce maximum output for a minimum of input), rather than products, per se. Now the focus has switched from material products (during the prosperous postwar years) to intellectual products. But, what remains the same is the *mechanism* at play: technology cannot serve up the miracles – the safeguards – unless it shifts the production frontier outward. The success of high technology depends on productivity growth. That productivity growth appeared to have slowed during the 1980s no doubt lessened the potency of using the word "productivity" – "technology," by contrast, and in particular, "high technology," was new and promising.

If such is the intuitive argument, how can this be seen, more concretely, in policy documents such as that produced by OFTA? The report recommendations follow a logic similar to that used in the early postwar years: the diffusion of new ideas and processes must enter every level of the workforce and at in every industrial sector; employment is guaranteed, not threatened, by technology; and the ever-looming threat of competition from other countries must spur action. Technology, like productivity, confers competitive advantage on countries. What differs between the postwar plans and the plans from the 1980s is the intensified focus on firm strategy, compared with national and industrial strategy.

For example, OFTA declares, as a "priority of priorities" that skills must be generated at all levels of the firm: as each day passes, industrial activity will be defined more and more by intelligent activity – the technological capital of firms is no longer confined to its researchers and engineers, but to all of its workforce.[1152] Technology must become a part of the *culture* – something to be addressed already at the level of primary education.[1153] The investment in technology must be accelerated because any "advancement" in markets is by definition fragile and temporary – a definite competitive advantage is

[1152] Ibid., p. 18
[1153] Ibid., p.18

conferred to those first to innovate; more informed moves may be made at a lesser price than competitors lagging behind.[1154] The activities of French firms, in addition, must be vertically integrated to include research, production and sales in order to gain synergies.[1155] OFTA suggests that the best way to seed flourishing market segments is to recapture domestic and international markets, simultaneously; outcome is measured by market share.[1156] OFTA concedes the relationship between innovation and employment to be complex, but urges France to invest in robotics to ensure employment opportunities, opportunities that will otherwise be claimed by other countries less hesitant to invest in this technology sector.[1157] It is also noted that employment creation occurs more prominently in small- to medium-sized firms – as confirmed by experience in the United States. Employment opportunities come with growth, and growth is more rapid in small- to medium-sized firms than in larger size firms. Such privileging also occurs in the earlier postwar plans calling for processes to enhance productivity.

Plan implementation and institutional empowerment

The overarching goal as indicated in the interim technology report appears to have been achieved, albeit on a slower schedule: France caught up with other countries in terms of R&D expenditure as a percentage of GDP. Whereas the technology study group had estimated R&D expenditures as a percentage of GDP to be low at 1.8% in 1980,[1158] by 1985, that rate had climbed to 2.3%, later to attain 2.4% by the early 1990s.[1159] During the early 1990s, the US rate reached 2.8%, the same rate attained in Japan, followed by Germany at 2.5% and the UK at 2.1%.[1160] Such figures, whether or not they are completely accurate or are even conceptually comparable (the US rate, of course, declines considerably when defense R&D is eliminated from the calculation), is not as important to understand as is the comparison *itself*: benchmarks provide grist for policy movement. In France, an increase in R&D expenditures was declared to be a priority –

[1154] Ibid., p. 19
[1155] Ibid., p. 19
[1156] In other words, trade is not a win-win situation, but a zero sum game. In other words, technology, like productivity, does not lead to specialization, but to the production of more and as much as possible.
[1157] Ibid., pp. 20-21
[1158] (France, 1981), p. 17
[1159] These figures are cited at: http://www.nsf.gov/statistics/s2194/conten2d.htm. Figures from the World Bank (WDI) suggest the percentage to be lower, at 2%, but these rates are virtually unchanged over time, since data became available in 1996, which casts doubt on their accuracy. See: http://databank.worldbank.org/ddp/home.do?Step=2&id=4&hActiveDimensionId=WDI_Series
[1160] These data come from the NSF web-site cited above, p. 1

linked to the idea of growth and future security – and policy measures were implemented to achieve the desired result. This process links to the productivity discourse insofar as R&D is deemed to be the purveyor of future security, following the oil shocks of the early 1970s and subsequent threats to economic growth – much in the same way that productivity enhancement – more literally – had become the rallying cry for a war-devastated economy in the late 1940s. Research and development spending may also be linked more directly to the oil crisis in France, insofar as the country maintained a high percentage of nuclear energy R&D expenditure throughout the 1970s, while in other countries, notably Japan and Germany, that share dropped quite precipitously.[1161] That productivity scholars, at this time, were attempting to discern links between depressed productivity levels and the oil crisis, as well as to determine if R&D spending could help explain productivity growth, lends support to the argument that productivity continues to figure centrally in terms of gauging the effects of a crisis and the articulation of solutions.[1162] Productivity concerns continue to frame and move policy forward.

How might this be assessed after plan implementation? A report issued by the *Commissariat Général du Plan* in 1983 details the implementation results of the interim plan.[1163] The commission singles out four challenges to be addressed: growing unemployment, aging productive machinery and equipment, elevated inflation, and a heavy external debt.[1164] R&D investment figures centrally in the report section, entitled, *Les activités productive,* which begins with the claim that the key to success concerning "the politics of employment" rests in the development and modernization of productive activities.[1165] The introduction goes on to suggest that *competitive production capacity* not only satisfies demand, but it also reduces dependence on energy; it improves commercial exchanges and the standard of living – national independence and cultural independence each depend equally on what is accomplished in terms of productive activity[1166] – productivity, full stop.

[1161] Ikenberry (Winter 1986), pp. 111-113
[1162] The reference is to Griliches' Fall 1988 paper.
[1163] France (November 23, 1983), *Commissariat Général du Plan,* "*Rapport d'Execution du Plan Interimaire (1982-1983), ND: Secrétariat d'Etat auprés du Premier Ministre*
[1164] Ibid., p. 1
[1165] Ibid., p. 72
[1166] Ibid., p. 72

In keeping with this productivity ethos, planners first outline the need to renovate industry. Most of what the planners summarize to have happened include further institutionalization of extended credits to industry, both nationalized industry, which augmented its investment in R&D from FF 9.5 billion in 1982 to FF 20.2 billion in 1983, as well as small- and medium-sized firms, which benefited from extended credits from ANVAR,[1167] from FF 450 million in 1981 to FF 901 million in 1983.[1168] The chapter next specifically focuses on research and technology in an attempt to address the aforementioned decline in state involvement in this area, not compensated for by firms – a law to address this deficit was circulated on July 15, 1982, helping to outline programs and actions.[1169] The "mobilizing programs" focus on the following themes:[1170]

- Rational production and usage of energy;
- Biotechnology development;
- Electronics;
- R&D aid for developing countries;
- Research into improved work conditions;
- Promotion of French scientific language and the diffusion of scientific culture; and,
- Technological development of industrial fabric

According to the report, steps have been taken to channel efforts into these areas, which are deemed to be high-growth sectors. Officials also confirm that R&D expenditures as a percentage of GDP have increased. What of it? It is noteworthy that an oil shock could jumpstart a flurry of activity[1171] – to enhance the productive machinery in an economy. That the oil shocks moved policymakers to address France's dependence on foreign oil[1172] and develop nuclear energy as an alternative energy source is not exactly counter-intuitive, particularly given the institutional structures in place to help facilitate centralized decisions. But the oil crises, coupled with what was seen to be growing global competition, in fact set off a

[1167] ANVAR and other institutional developments tracing to the interim plan are discussed in later sections of this chapter.
[1168] Ibid., p. 73. MDF is assumed to be "billions of French Francs," while MF is assumed to be "millions of French Francs."
[1169] Ibid., p. 81
[1170] Ibid., p. 81
[1171] Much of this "activity" translates into institutional empowerment of various sorts.
[1172] At the beginning of the 1970s, crude oil imports figured at 67% of total energy requirements in France, a level that had dropped to 49% by 1981; in the US those numbers are 6% and 14%, respectively, indicating an increasing role for oil imports. See Ikenberry (Winter 1986), p. 108

near-multiplier-effect of investment in (and institutionalization of) "innovation," or "high-technology." This developing "pattern of activity" in France, as in the United States, was clearly legitimized by the claim that such would enhance productivity (or competitiveness). The counterfactual: could an appeal for greater investment and funding going to R&D have been accomplished without grounding the debate in terms of securing a productive economy? In a world of scarce funding sources, it would appear reasonable to assume that linking R&D investment, for one, to the healthy running of a competitive, productive economy would facilitate policy passage. If not, why was the link made?

By the time of the eighth and ninth plans, then, the focus (as noted) shifts to high technology, R&D, and knowledge production, more generally, with each term being conflated with productivity in various permutations across scholarship and government agencies. What were the effects for France? It has already been shown that R&D, as a percentage of GDP, increased, following plan implementation, albeit at a slightly lower rate than what the planners had envisioned. Both the eighth and ninth plans shared a similar focus on technology. Did the economy, more generally, shift strongly in favor of high technology production?

It depends on what importance is attached to the proxies used to measure this outcome – and the validity of these measures are not unquestioned in the literature.[1173] From the official World Bank site, *World Development Indicators,* data for years available show that for France "high-technology exports as a percentage of manufactured exports" increased from 15 percent in 1988, climbing to 23 percent in 2001.[1174] If the measures are accurate, these numbers would suggest that a higher proportion of exported products became devoted to "high-technology" – one indicator that the country was becoming more technology intensive, or that exports increased as firms devoted larger percentages of their budgets to R&D, a claim made by French planners.[1175] Placing definitions of what "high technology" means[1176] aside, what is clear is

[1173] See, for example, the work of Benoît Godin (2004), "The obsession for competitiveness and its impact on statistics: the construction of high-technology indicators," *Research Policy,* 33, pp. 1217-1229.
[1174] http://databank.worldbank.org/ddp/home.do?Step=3&id=4 . The figures dipped in 2003 and 2007 to 19 percent.
[1175] As noted in this chapter.

that France – erstwhile lamenting its position vis-à-vis Germany, Japan, the US and the UK, had managed to catch up in some indicators linked with high technology, but not in others. For example, according to an OECD study, France (11th place), preceded by the Czech Republic, lags behind all four countries in terms of its share of "high- and medium-high-technology in manufacturing exports (2007)" – yet, in first place is Ireland, followed by Japan; Mexico stands between Switzerland and the United States.[1177] The line-up does not reveal an immediately intuitive narrative, but it shows France *on the charts*, with new benchmarks at its disposal for policy legitimization. France, like other industrialized nations is now ranked among other countries according to new measures – "high-technology" measures – exports and market shares now place countries, as opposed to productivity, per se. But the rhetoric of productivity, perhaps because it legitimizes a switch to "high-technology" investment, continues to figure in the discourse.

For example, a 2011 report produced by the European Commission, "Science, technology and innovation in Europe,"[1178] is divided into three sections. The third entitled, "Productivity and competitiveness," is, in turn, divided into three parts: "Innovation," "Patents" and "High-technology."[1179] Again, the edition features innumerous charts and data, framing data for these categories in different ways, such as "Enterprises with innovation activity,"[1180] "Innovation objectives during 2006-2008 as a percentage of innovative enterprises,"[1181] "World market share of high-technology exports,"[1182] and "Statistics on employment in high-technology manufacturing sector,"[1183] – among scores of other charts. In many of these charts, France falls somewhere in the lower portion of the upper half of "top-performing" EU countries. For the specific goal declared in the ninth plan to increase the number of firms producing "high

[1176] According to Godin, the OECD subsumed the following industries under "high-technology" intensity in 1986: aerospace, office machines (computers), electronics and components, drugs, instruments, electrical machinery. Ibid, p. 1223.
[1177] These data are available at: http://dx.doi.org/10.1787/744513042674
[1178] European Commission (2011), Eurostat, "Science, technology and innovation in Europe," Luxembourg: Publications Office of the European Union. This is a yearly report. The latest available was used as an example.
[1179] Ibid., p. 9
[1180] Ibid., p. 83
[1181] Ibid., p. 90
[1182] Ibid., p. 125
[1183] Ibid., p. 134

technology," France does quite well, in third position with 16,038 firms behind Germany (21,404) and Italy (30,785).[1184]

From this report the blurring of indicators and meanings attached to them are evident. In one survey published in the 2011 report, firm representatives between 2006 and 2008 were asked which "innovation objectives" had "high importance" (expressed as a percentage of innovative enterprises). The results for France were reported as follows:[1185]

- Increase range of goods and services (56.3)
- Replace outdated products or processes (35.1)
- Enter new markets (40.9)
- Increase market share (47.9)
- Improve quality of goods or services (49.7)
- Improve flexibility for producing goods or services (25.0)
- Increase capacity for producing goods or services (25.7)
- Improve health and safety (20.8)
- Reduce labor costs per unit output (22.7)

Such a list shows quite definitively how ambiguous the term "innovation" and its expected outcomes really are and how, at any level, they might relate to "productivity": it fosters low-cost production, or improves product quality – it might also improve production processes – any of which could in one way or another increase market share. The highest and lowest scores, curiously, exactly reflect the switch in productivity conceptualization, from the early postwar years to the following years of prosperity.

It is also important to note how the concept of "productivity" in this report is linked to competitiveness and how under this title, innovation, patents and high technology are subsumed. Many of the charts cover firms. This framing of the data can be linked to the modernization plans in France, as in (presumably) the discourse going on in parallel in other industrialized nations. Statistics, of course, have been claimed in this study to serve as policy triggers, meaning that the numbers and the report, itself, are likely to guide policy

[1184] Ibid., p. 123. Note that planners had lamented during the late 1970s/early 1980s that France had documented only 1,300 firms with interests in "R&D activities." See France (1981), p. 22
[1185] European Commission (2011), p. 90

decisions well into the future. The demand for such statistics, of course, enhances the powers of those institutions (see below) dedicated to documenting them. New rankings are also influential movers of action. Rankings provide benchmarks against which to gauge success; such is all part of the work of the discourse.

Thirty-five hour workweek. During the postwar years, productivity was claimed capable of delivering more leisure in the form of a shorter workweek; such counted among its many promises to labor. By the time of the ninth plan, the elusive reduction in work hours came back to the table for discussion. At first, support for and against the reduced workweek and nationalized industries split quite clearly along party lines; the socialists supported a 35-hour workweek, while those in parliament advocating an ideological switch towards neo-liberalism opposed it. Curiously, both sides either legitimized or contested the policies and ideas through arguments about productivity.[1186] For the 35-hour workweek – discussed during the ninth plan debates by the National Assembly and introduced by the socialists in 1998 – policy analysts thereafter began to parse the effects: on the positive side, the 35-hour workweek was conceded to have introduced flexibility into French production, because the number of hours was an annual average: production could be stepped up during times of high demand and lowered in times of diminished demand. But analysts were also quick to point out that, "The big losers … are those sectors in the economy that cannot increase productivity through flexible work times."[1187]

Scholars Crépon and Kramarz studied the effects of the mandatory 39-hour work week, imposed in 1982 under Mitterand, and found that minimum wage workers, whose monthly compensation could not decline under the law, were first to be replaced by new workers.[1188] These analyses show that productivity gains, or policies designed to create them, do not obtain across the board; some social groups benefit while others do not. In any event, it can be inferred that arguments linking the length of the workweek to productivity (either because a reduced workweek was hypothesized to induce flexibility in production, or because such

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[1186] See the chapter section, "Discourse legitimization and contestation), beginning on p. 321
[1187] Gunnar Trumball (January 2001), "France's 35 hour work week: flexibility through regulation," Center on the United States and France, Brookings Institution, pp. 1-2. See: http://www.brookings.edu/fp/cusf/analysis/workweek.htm
[1188] Bruno Crépon and Francis Kramarz, (December 2002), "Employed 40 hours or not employed 39: lessons for the 1982 mandatory reduction of the workweek," *The Journal of Political Economy,* 110:6, p. 1386.

would create jobs in the face of productivity gains) proved not to be compelling over the long run, given the controversy and redefinition of the law since its introduction. In this case, productivity is once again used as a way to legitimize an institutional move. But, "working less" ultimately failed to resonate across parties or time, for that matter.

Ideological splits, non-splits. Much like the reduced workweek, the nationalized industries in France received support or contestation based on the perceived link to productivity. For the socialists, nationalized industries could be encouraged to invest more in R&D, thereby providing the engines of growth, while those in parliament advocating a more neo-liberal turn of government decried their deleterious effects on the efficient functioning of a free market.[1189] In fact, Vivien Schmidt argues that policy moves occurring subsequent to the ninth plan debates were not ideologically based, but focused on the need to infuse the nationalized industries with capital, aiming to step up productivity and growth.[1190] The socialists, according to Schmidt, provided the capital promised with some long ill-faring companies, such as Renault, Sacilor and Usinor, showing clear improvements after the infusions.[1191] Schmidt's work evidences the drive on the part of the socialists to ramp up company efficiency and competitiveness through such infusions; the government did not interfere with management decisions at the level of individual firms, particularly those in fields linked to high productivity growth, such as aerospace and electronics.[1192] This point – that decisions were based on decisions linked to firm competitiveness, not ideology – is further substantiated by Schmidt's claim that the socialists were careful to maintain firm appointments based on "… traditional elite credentials rather than on political affiliation…."[1193] And, later, when denationalization was on the table, Schmidt argues that decisions to privatize were mainly based on the need to raise further capital.[1194] It could then be argued that competitiveness and productivity, however related and the ideas thereof, were more powerful movers of economic institutionalization than political interests.

[1189] See under "Discourse legitimization and contestation," of this chapter for the arguments presented.
[1190] Vivien Schmidt (October 1988), "Industrial management under the socialists in France: decentralized dirigisme at the national and local levels," *Comparative Politics,* 21:1, pp. 53-72
[1191] Ibid., p. 53
[1192] Ibid., p. 57
[1193] Ibid., p. 60
[1194] Ibid., p. 62

Institutionalizing research activities. During the postwar years, the heavy emphasis on productivity growth in the early modernization plans worked both to empower institutions already in place – the more centralized and focused role of INSEE is one example – as well as to create new ones, such as the European Productivity Agency and the productivity exchange programs developed through the Marshall Plan. The call for innovation, or what is here presumed to be another code word for productivity growth, exerts the same kind of effect. In the eighth plan, French authorities placed emphasis on the need to adapt research priorities and initiate ways in which to diffuse knowledge and technology[1195] – the call is similar to that made for modernization (which resurfaces in the ninth plan) and productive techniques during the postwar years.

In these efforts, planners stress the need to continue funding basic research – the foundation of the future, as productivity growth had been during the postwar years. The planners note that Japan and Germany lead in these efforts; the UK and the US lag, while France lies somewhere in between. Planners point out that technological research among firms remains highly concentrated in France, with barely 1,000 firms conducting research, 500 of which account for only 5 percent of the total research spending and staffing.[1196] Planners consider this concentration to be a key weakness in the organization of research efforts, which they aim to address. Here again, the focus is shifting to firms and, interestingly, efficiencies appear to be viewed in terms of dispersion, rather than concentration. At this time, disaggregation is privileged in the discourse; the focus has shifted to the parts, not the whole, per se. This shift is evidenced in the way policy is framed; planners outline the need to provide financial incentives for firms contracting research through laboratories or public research institutes – clearly the goal is not just to ramp up basic, but also applied research. Universities are additionally targeted and urged to rethink the role of research and its economic concerns.[1197] Arguably, this could count as a first step in what was later to be developed into a new concept: the entrepreneurial university.

[1195] France (1979), p. 60
[1196] Ibid., p. 60
[1197] Ibid., p. 60. Chapter 10 presents a discussion of how French legislation was influenced by the Bayh-Dole Act, altering the relationship between universities and industry, for example.

But, state institutions continued to play a role and were developed, as well, during this intensified quest for innovation investment. Some of the new institutions and public support created and discussed in the eighth plan include the *Commissariat à l'Energie Solaire,*[1198] studies aiming to strengthen the production of integrated circuits, TRANSPAC (the first public IT network), and ARIANE,[1199] including the development of telecommunication satellites.[1200] The focus, clearly, is on IT development, and the concern with the future – the call to action – is linked to institutional empowerment in this technological area.

From the interim plan on technological development, study authors write about the need to disperse regional networks of innovation aid[1201] in much the same way as the earlier modernization plans sought to create vast networks of productivity centers. Credit institutions such as ANVAR[1202] were handed a stronger mandate with this plan to help, in particular, the development of innovation at the level of small- and medium-size firms. As noted, ANVAR received substantial funding from according the interim plan assessment produced by the *Commissariat Général du Plan* in 1983. In fact, a large share of the "organizing activity" surrounding the discourse on innovation (productivity growth) translated into institutional empowerment.

For example, in addition to pressing nationalized industries for more commitment to R&D, the French government created committees, institutions and funding to do the same for small- and medium-sized firms: *l'Agence pour la Création d'Entreprises* had its budget more than double, from 1982-1983, to reach FF 37 million. Other examples include the *Fonds Industriel de Modernisation*, created in 1983 – such institutions, for example, are linked to still other industrial institutions supporting "modernization," in one form or another, such as CODVEI and MECA,[1203] and ADEPA.[1204] The list, in fact, continues for pages in this report. That the discourse enabled institutional empowerment is quite clear.

[1198] Commission for Solar Energy
[1199] Some of these programs, of course, were collaborations across Europe.
[1200] Ibid., p. 61
[1201] France (1981), p. 90
[1202] Ibid., pp. 81, 84, and 90. ANVAR stands for *Agence Nationale de Valorisation de la Recherche*, which was created in 1968 to help diffuse innovation; in 1979 the institution began to offer short-term loans and such to help support innovation. See: http://www.ambafrance-uk.org/Public-research-agencies-in-France
[1203] *Machines et equipments de conception avancée*

In 1982, OFTA *(Observatoire Français des Techniques Avanceés*) was created through university affiliations to help outline technology strategies; in 1983, for example, OFTA produced recommendations for the *Commissariat Général du Plan* in preparation for the ninth plan. [1205] In terms of institutional linkages, it is interesting to note that the planning commission was now contracting with universities to help – the privileging of knowledge in these plans coincides with this development.[1206]

The question remains: what did the institutions do? Because of the ambiguities associated with high-technology products, or knowledge-based sectors, it would be as good as impossible to trace links between proliferating institutional support in France for the development of high-technology goods and industries.[1207] But, what is important is the role institutions intuitively play in terms of diffusing the discourse on high technology, R&D and competition – however planners sought to frame their goals. The diffusion of such institutions and credit agencies reminds of the institutionalized efforts during the early post-war years to disseminate the ideas of productivity – both training centers, as well as financial arrangements geared to boost productivity enhancement efforts, in France. Like for the earlier productivity centers, institutions promoting innovation and competition (R&D and high technology) become part of the language and references used by firms and are documented in government reports; such is a clear mechanism of diffusion. Statistics used to gauge the country's progress – whether that be "percentage of exports in high-technology sectors," or "R&D as a percent of GDP" – legitimize the activity by providing benchmarks and comparative international gauges in much the same way as productivity statistics did during the postwar years.[1208]

[1204] *l'Agence pour le Développement de Production Automatisée*
[1205] France (June 1983). The organization was created by the *Société Amicale des Anciens Elèves de l'Ecole Polytechnique.* p. 1
[1206] Recommendations issued in this report are covered earlier in this chapter.
[1207] "High technology" begs to be defined. See chapter 10 for a discussion of this point.
[1208] The use of statistics gauging "innovation," "high technology" and other such indicators is discussed in chapter 8.

Discourse legitimization and contestation

The eighth plan was adopted by the center-right government of Giscard d'Estaing, but was never reviewed by parliament. Some of the contested points, however, can be inferred by the comments received from the *Conseil Economique et Social.*[1209] A report drafted by the council in 1980[1210] clearly represents public sentiments and competing discourses – that is, indeed, the purported mission of the council, which is considered to be an integral function of a democratic government and the planning process. In fact, each representative group – private businesses, farmers, unions and other social organizations – votes on the opinion delivered by the council.

In this report, the council agrees with the planning commission's assessment that geo-politics have shifted in a major way, creating disequilibria at every level, but expresses serious reservations about the study's commitment to address unemployment.[1211] The council observes that public authorities, who drafted the plan, privilege a break with interventionism that may compromise efficiencies in the economy, as well as the idea that technological progress, which affects production *mechanisms,* lessens the significance of industry *sector* analysis.[1212] The council, on the contrary, deems it important to analyze principle economic segments and track their evolution to better understand interdependences and to anticipate negative scenarios before they develop. Universities then would be able to provide the education needed for future jobs, thereby avoiding employment downturns.[1213] Again, it is the link between technology and employment – similar to what was discussed in terms of productivity growth – that takes center stage. The dominating discourse suggests that technological progress – productivity growth – will create opportunities for all of France; the Economic and Social Council is not so sure.

[1209] The Economic and Social Council is an advisory body to the government and parliament. It is the third most important constitutional assembly, representing the views of the country's "driving forces," including business, unions and other representative groups. See http://www.lecese.fr/
[1210] France (1980), Conseil Economique et Social, "VIIIe *Plan de Developpement Economique et Social: Avis Adopté par le Conseil Economique et Social au Cours de saSséance du 5 Novembre* 1980, *Palaiseau: Record-Graphic*
[1211] Ibid., p. 3
[1212] Ibid., p. 4
[1213] Ibid., p. 2

In the report section titled, "The basis of the French transformation," the council presents first the technological revolution, relegating the energy crisis to a third position. This seemingly small detail in fact betrays an often-sidelined concern – or contestation – of the productivity/technology discourse: social displacement as a result of new work organization. The Council, in fact, challenges the long prevailing idea that technological progress generates confidence in the future. Indeed, the council counters that the plan itself exudes wariness over France's future and that the consequence of technological progress has had dubious effects on the general standard of living, work conditions and employment levels.[1214] Underscoring this sentiment, the council stresses the need, on the part of planners, to provide transparency in terms of what changes in the workplace the public may expect – only in this way can a true social partnership evolve.[1215] Interestingly enough, the council suggests that social innovation parallels technological innovation, noting that technological change profits some, leaving others behind[1216] – as though the council is attempting to pre-empt a "double movement"[1217] and make bring about growth accompanied by social safety nets.

The various social, economic and business groups represented overwhelmingly approve the eighth plan: 117 "for," 28 "against," and 26 abstentions.[1218] Groups that voted against the recommendations include various unions, the CFDT and CGT,[1219] their statements generally reflecting the notion that the plan does not propose sufficient measures to counter unemployment.[1220] Another union group, the CGTFO,[1221] abstained, citing its reservation about the entire plan being based on firm competitiveness without showing sufficient support for public services and nationalized industries – the "efficiency" of which is necessary for a "vigorous economy."[1222] Private business voted for the plan but rejected a proposed amendment to reduce the workweek,[1223] citing a need to strictly define under what conditions the reduction should take

[1214] Ibid., p. 11
[1215] Ibid., p. 11
[1216] Ibid., p. 11
[1217] The reference is to Polanyi's use of the term, "double movement," Polanyi (2001)
[1218] France (1980), p. 47
[1219] The French Democratic Federation of Labor and the General Federation of Labor, respectively.
[1220] Ibid, pp. 57-58
[1221] The General Confederation of Labor (France)
[1222] Ibid., p. 59
[1223] Ibid., p. p. 51. The reduced workweek was a promise long in the making, but never realized on a permanent basis.

place.[1224] The split in votes are eminently predictable, but the perceived need to achieve international competitiveness is sufficiently cross-cutting[1225] to allow plan approval. The plan was never debated in parliament.

The ninth plan, by contrast, made it to the French parliament and debates began in the national assembly on June 14, 1983.[1226] Prime Minister Mauroy opens the debate, deploying rhetoric and delivering arguments very similar to his comments in the introduction of the ninth plan. New technologies will progressively model social organization, noting that economic and political advantages are conferred on countries initiating the change – Japan and the United States are singled out as examples.[1227] The need for autonomous growth, while capturing international markets as well, is critical to the survival of France – the new version of competition is a threat, and the plan is responding to a crisis.[1228] Although French consumption has been stimulated and has, thereby, contributed to high growth (second only to Japan), consumption is based on too large a share of foreign products.[1229] Only by modernizing productive units will France find the necessary margins to maneuver out of the crisis: "modernize or decline," says Mauroy, echoing a phrase used by Jean Monnet thirty years earlier.[1230]

Is the prime minister, fundamentally, making the same call for increased productivity that colors the early postwar plans? Yes, but from a different angle. He states, "Scientific research and technology, as well as a better work organization constitutes the source of all growth and productivity."[1231] Even the call to include the consent and participation of workers in this economic transformation sounds oddly similar to that delivered during the early plans: "Without a new social dynamic in parallel to research efforts, no progress in economic productivity can be made … the rights of salaried workers in firms will provide the legal

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[1224] Ibid., p. 56
[1225] The idea that international competitiveness is cross-cutting in the sense that these ideas find currency in both Giscard d'Estaing's center-right government, as well as François Mitterand's socialist government. The unions represented, clearly, opposed the plan's orientation, or its negligence of the unemployment issue.
[1226] France (June 15, 1983), *Journal Officiel, Débats Parlementaires, Assembleé Nationale, 1re Séance du Mardi 14 Juin 1983*, pp. 2481-2493
[1227] Ibid., p. 2482
[1228] Ibid., p. 2482
[1229] Ibid., p. 2482
[1230] Ibid., p. 2483
[1231] Ibid., p. 2483

frame for this dialogue."[1232] Workers, too, must be better integrated in the life of a firm – being both better informed and qualified.[1233] Even the call for a reduced workweek resurfaces in these debates. As long as such does not diminish international competitiveness, this measure could be "efficient" for a modernizing economy – such would entail a more efficient use of equipment, as well as a placing a higher valuation on work, while addressing employment concerns at the same time.[1234] Low-level wages should be re-evaluated, as a priority, but any increase in production costs that thwarts competitiveness should be avoided.[1235] An effort to decentralize the country complements these efforts[1236] (a theme that surfaced in the earlier postwar plans). It is important to note that the call to stave off decline does not refer to a particular outcome, such as standardized products and processes that characterized the early postwar discourse. During the 1980s and 1990s, by contrast, French elites are articulating progress and competitive survival in terms of a more ambiguous and elusive outcome: innovation, or technology.

A contested debate about the planning process itself is abundantly in evidence during the debates. The prime minister, himself, first delivers a pitch for planning during these debates. But, the address by the prime minister is met with the scornful remarks of Alain Madelin,[1237] "That's a good one, Mr. Prime Minister!" Mauroy finds himself justifying the planning process, now contested by members of the centrist party, *Union pour la Démocratie Français, as well as the rightist party, Rassemblement pour la République.*[1238]But more than just political jockeying, the challenge appears to come from the "failure" of the seventh plan, which Mauroy blames on "indifference."[1239] *This* plan is to be different, and it must succeed because France now faces a crisis – the call, again, for action. Jean Le Garrec,[1240] the Secretary of State (Office of the Prime Minister), also comes to the defense of the ninth plan explaining that it provides the needed lucidity to outline priorities and goals – it is also an appeal to the nation, and Le Garrec reminds

[1232] Ibid., p. 2484
[1233] Ibid., p. 2484
[1234] Ibid., p. 2484. See footnote xyz for a brief account of a more recent debate on this issue in France.
[1235] Ibid., p. 2824
[1236] Ibid., p. 2485
[1237] At the time of this debate, Alain Madelin belonged to the centrist party, *Union pour la démocratie français.*
[1238] The debate details which groups are applauding – the communist and socialist parties – and those that are challenging the prime minister. Ibid., p. 2485
[1239] Ibid., p. 2485
[1240] Jean Le Garrec is a member of the socialist party and has held many political functions and titles in France.

his detractors of the need to credit the Monnet plans for the rapid economic growth achieved in France during the 1950s and 1960s.[1241] Planning, then, is thusly legitimized.

More specifically, planning is needed to address what Le Garrac calls France's "academic failure"[1242] as evidenced by the deficit in skills and knowledge needed to meet the new economic and technological challenges. Somewhat ironically, the secretary of state mentions the industrial town of Avesnes-les-Auberts, where a mini IT center had recently been established – he notes that a very small percentage of boys over five years (1.8%) went on to pursue higher education, with only 8% having completed secondary school; such represents the level of deficit to be addressed.[1243] The secretary of state traces such dire results to 19th industrial times, when workers in the steel industry were exploited, a historical episode from which the town never recovered.[1244] The question becomes: why did productivity not save this town, per the earlier pledges, now being repeated, to diffuse benefits to smaller regions in France? Can innovation save such towns? Le Garrec concedes that automation (read: new technology) endangers jobs, at least in the short term, but suggests that, through planning, work time and work organization can accommodate these changes to render production more efficacious at the same time sparing employment losses.[1245] At the end of the Le Garrec's statement, a member of the centrist *Union pour la démocratie français,* Emmanuel Hamel, sums up sentiment from the center-right: *Flatus vocis!*

Against this backdrop of protest, rapporteur for the plan's finance commission, Jean-Paul Planchou[1246] defends the planning process, describing it as a ways to organize collective will: "… the success of the plan lies at the heart of the battle of ideas."[1247] Productivity, though, helps to legitimize this quest. Planchou claims that France has two choices: either to accept the international division of labor, such that it is, or to "… loosen the vise of constraints, by creating new productive capacities in order to privilege autonomous

[1241] Ibid., p. 2486
[1242] Ibid., p. 2486
[1243] Ibid., p. 2487
[1244] Ibid., p. 2487
[1245] Ibid., p. 2487
[1246] Jean-Paul Planchou is a member of the Socialist party.
[1247] Ibid., p. 2489

growth."[1248] Planchou describes the plan as a strategy for investment in addition to fulfilling other tasks, such as facilitating the transition to a culture of technology – importantly, he stresses the new role accorded to firms in French society and the fact that firms form the basis of the plan's design.[1249]

Planchou expresses some reservations about the plan, particularly, whether or not the goals are sufficiently clearly articulated. He then speaks about looming unemployment issues, noting that productivity gains cannot be solely compensated by a reduced workweek – absolute economic growth is imperative, and more must be done to secure job creation.[1250] But more importantly, the rapporteur points out the difficulty in the math: investment among firms is to be encouraged, which in turn means that incentives to save must be in place; firm margins must be able to accommodate this orientation, which means that social charges must be covered without encumbering production costs. The question that Planchou poses is: how are productivity gains to be distributed without compromising firms' competitiveness, pricing issues, investment incentives, and more?[1251] But, these concerns are about details. All are in agreement that growth will solve France's employment problem,[1252] and the details will be worked out once the conditions for competitiveness are secured. France must first succeed vis-à-vis at least four reference countries: the United States, Great Britain, Germany, and Japan.[1253]

The fact that economic growth through competitiveness (and, by association, innovation and modernization, and or productivity) is cross-cutting in these debates can nearly be more clearly seen by understanding where the *real* dissension exists: it is in the planning process and the role of the state, hinted at during the first session on June 14, but debated extensively and bitterly during the second session on the same day.[1254] Michel Bernier questions the secretary of state: "… if you were an entrepreneur, would you

[1248] Ibid., p. 2489
[1249] Ibid., p. 2490
[1250] Ibid., p. 2490
[1251] Ibid., p. 2491
[1252] This was the response by Gustave Ansart, a member of the communist party, coming from a family of workers and himself worked in a factory from the age of 13.
[1253] Ibid., p. 2493
[1254] France (June 15, 1983), *Journal Officiel, Débats Parlementaires, Assemblée Nationale, 2e Séance du Mardi 14 Juin 1983*., pp. 2495-2516

make use of this Plan to base your growth predictions?"[1255] Bernier later suggests that what the plan really needs to address is the role of the State in French society, noting that in during the late 1960s in France, one-third of each workday went to the state and to social security, whereas at the time of this debate, the figure had climbed to one out of two days.[1256] This rate is compared to those in Great Britain, Germany, Japan and the United States – each of which reports lower rates of state involvement.[1257] Liberalism is fueling economic recovery in Germany, Great Britain and the United States, according to Bernier, who also condemns the high rate and deleterious effects of French industrial nationalization.[1258] "Long live Reagan!" exclaims (presumably facetiously) Christian Pierret,[1259] member of the socialist party. Socialist party member Dominique Taddei responds to a litany of complaints about the plan by François d'Aubert,[1260] suggesting that D'Aubert, influenced by American culture, has just delivered an "…nth version of a catastrophic film."[1261] To which d'Aubert retorts: "No American University would want you!"[1262] The battle is about political ideas on both sides of the Atlantic – it is not about the need to innovate and be competitive. Moreover, the battle is strangely reminiscent of the fourth-plan debates, whereby some parliamentarians questioned encroaching American consumerism, but not the need to deliver productivity growth.

Crediting the idea of a "myopic market" to economists such as Kenneth Galbraith, André Laignel[1263] argues that important technologies may not even be profitable in the short- to medium-term. Pricing, he suggests, is not determined by consumers, but set by large firms. The plan is thus necessary to correct for the market's focus on short-term gains.[1264] The plan also oversees the national wellbeing as a whole and encourages a social balance, where markets have created inequalities.[1265] The discussion on inequalities

[1255] Ibid., p. 2511
[1256] Ibid., p. 2512
[1257] Ibid., p. 2512
[1258] Ibid., p. 2512
[1259] Ibid., p. 2506
[1260] François d'Aubert was a member of the *Union pour la Démocratie Française et du Centre* at the time of the debates.
[1261] Ibid., p. 2510
[1262] Ibid., p. 2510
[1263] André Laignel is a member of the Socialist party.
[1264] Ibid., p. 2520
[1265] Ibid., p. 2520

invites more rejoinders from the center right: "We're not in Sweden!"[1266] Laignel believes that the opposition is confounding egalitarianism with inequalities, and he remains focused on the primary goal of the plan: encourage growth.[1267] Laignel further legitimizes planning by pointing out that "… all big countries have strategies."[1268] Lionel Jospin declares there is an ever-greater need for planning during time of uncertainty, such as the current time of technological transformation, arguments that the opposition continues to challenge.[1269]

Hence, ideological splits are clear, but growth seals the divide, from left to right: communist party leader Georges Marchais declares his party "in" on the commitment to render production competitive, but for all industries, not select ones.[1270] And so, the themes repeat; each party has particular points with regard to how growth should be encouraged, but each agrees that growth, competitiveness and investment in technological innovation – however related – are key to France's future.

Where did productivity go? This is the question asked by Pascal Clément,[1271] who accuses the socialists of committing the error of omitting plan coverage of productivity.[1272] Clément's declarations are interesting, because they frame the debate and also illustrate how the different economic indicators have become conflated in the ninth plan, as well as in these debates. He states that the socialists erroneously believe productivity is what falls out of investment, research, education and more – for Clément, productivity should be the prime mover, the indicator below which all other measures should be subsumed.[1273] Why? Because new jobs can only occur with gains in productivity; demand can be extended only with such gains; the same argument is made for "high technology." Clément charges that the socialists believe employment comes from redistribution of state means. He laments the absence of the term, "productivity" in the plan section devoted to the need for new firms to develop, because such firms are most likely to achieve high

[1266] This comment comes from Pierre Micaux, member of the *Union pour la democratie français.* Ibid.,, p. 2520
[1267] Ibid., p. 2520
[1268] Ibid., p. 2520
[1269] Ibid., p. 2525. Lionel Jospin, Prime Minister of France during 1997-2002, is a member of the socialist party. Times of "uncertainty" are useful to think about in terms of Blyth's concept of "Knightian uncertainty." Blyth (2002).
[1270] Ibid., p. 2522.
[1271] Pascal Clément is a member of the center-right party, *Union pour un Mouvement Populaire.*
[1272] Ibid., p. 2562
[1273] Ibid., p. 2562

productivity gains.[1274] Clément's point has some merit: he is looking for a specific benchmark. Policies would presumably differ if the focus remained trained on productivity, or if it covered a string of elusive indicators, purported to achieve the same result, a way to extend the production frontier. But Clément's argument, the focus on a single indicator, is too obtuse to gain traction. Growth comes from productivity and competitiveness, innovation and high technology.

With a discussion of productivity, comes the debate on employment. Clément accuses the socialists of focusing on a reduction of workweek hours and points out that a recent study by INSEE shows a 39-hour week to have created 15,000 to 30,000 new jobs, at best.[1275] For Clément, if wages hold steady and all productivity gains go towards the reduction in work hours – referring to the latest proposition for a 35-hour workweek – then France reneges on economic progress. He also wonders how a uniform drop in the workweek squares with productivity gains that are likely to differ from sector to sector and from firm to firm.[1276] Clément muses why the socialists seem to think that the French are incapable of added exertion.

In truth, some socialists adhere to the notion that the workweek must be reduced in the face of productivity gains – such is, for example, the argument of Taddei.[1277] Those to the center-right, such as Michel Bernier, generally believe that unemployment can only be addressed by increasing France's competitiveness – not by work-sharing agreements.[1278] But, as noted earlier, some members of the socialist party, such as Planchou, stress that the reduced workweek cannot, by itself address unemployment – growth is necessary. Again: growth, competitiveness, innovation, productivity – any or each of these notions are crosscutting in an otherwise bitterly divisive parliament.

The unanimous appeal of these concepts, however conflated, is reminiscent of the early statements about productivity in the early postwar modernization plans, which were also in evidence during the fourth-plan

[1274] Ibid., p. 2562
[1275] Ibid., p. 2562
[1276] Ibid., p. 2563
[1277] France (June 15, 1983), p. 2509
[1278] Ibid., p. 2514

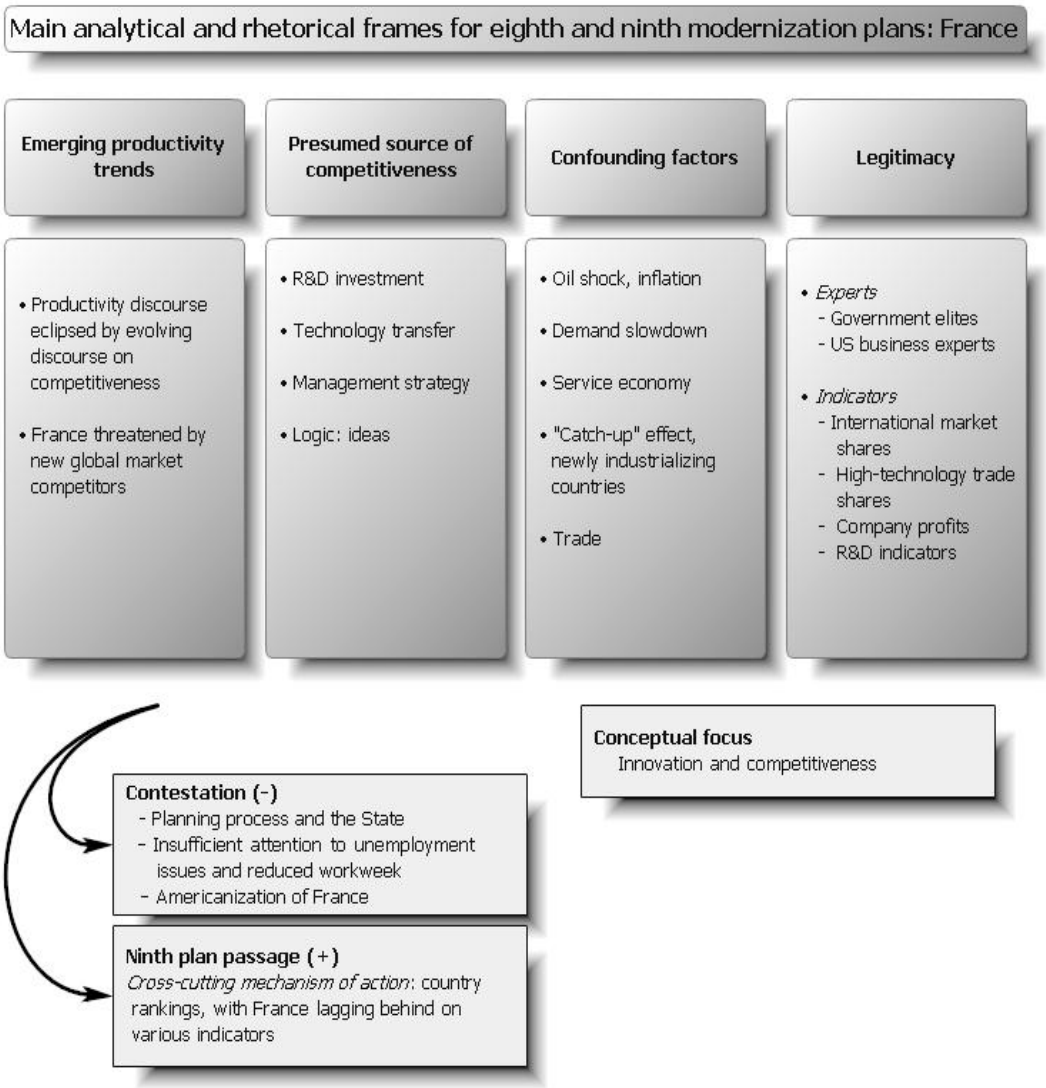
debates. What differs in the ninth plan debates is the lack of a singular focus on productivity – and, importantly, the central role of entrepreneurs and individual firms in securing the nation's future. This shift arguably translates into another criticism of the plan. Bernier, like other center-right colleagues, lament the lack of "quantification" in the plan.[1279] With a focus on productivity, a single indicator, a benchmark – however measured or however accurate – was available to judge and gauge outcomes. How do you judge competitiveness and innovation? A multitude of indicators are necessary. And such may explain Clément's misconception that productivity, as a measure, is absent in the ninth plan – productivity, and what leads to its growth, has long been elusive and has been shown in this dissertation to shift over time. If the discourse now focuses on the means of productivity growth, rather than the level of productivity growth as an outcome, that doesn't necessarily de-legitimize the power of productivity as a social and political concept. If the outcome of interest is now competitiveness, and productivity is one means of achieving that outcome, the power of productivity, as a concept does not diminish. On the contrary: the fact that more indicators are now available for comparison, all of which have constructed, but no essential meaning, simply creates more opportunities to deploy rhetoric in order to achieve political aims. The ambiguities in how all of these concepts are related no doubt helps speed passage of the plan.

At the end of the third meeting, Clément presents a motion to send the plan back to the commission, but this motion fails to pass: 329 voted against the motion, 159 for.[1280] A vast majority of those opposing the motion are members of the (ruling) socialist party. It could, then, be argued that the vote represents nothing more than a split between power interests. In what way was this plan cross-cutting? There is no disagreement in the debates about the need for economic growth and the development of a modernized, productive industrial sector. There is also agreement on the need to invest in R&D, innovation and/or whatever will render France competitive vis-à-vis other countries in the globalizing market. The contestation comes at the level of what role the state should play in guiding this outcome. In the early postwar plans, some members of parliament – not a chorus – objected to a growing influence of American consumerism in French society; by the 1960s, when the fourth plan was debated, different groups of

[1279] Ibid., p. 2499. This is a charge made by Christian Goux, member of the Socialist party.
[1280] Ibid., pp. 2565-2566

political interests – unions, farmers, social and regional representatives in France – expressed dismay that gains achieved during the years of rapid growth had not been equitably distributed. The dispute was not about productivity, per se. Here, arguments are not being waged over the goal, but how it should be achieved. There is very little to distinguish the main goals of the ninth plan, under socialist president François Mitterand and the eighth plan drafted by the center-right government of Valéry Giscard d'Estaing. Figure 9.1 relates the main components of the postwar conceptualization of productivity to the eighth and ninth modernization plans.

Figure 9.1



Summary points and relevance for "truth claims"

1. The call to stave off decline and spread of ideas about productivity to different social "locations," namely in policy documents and new institutional configurations. As during the early postwar years, policymakers in France during the early 1980s issue appeals – calling slack to order – in order to maintain France's position in the world economy. At this time, however, instead of directly appealing to productivity growth, policymakers compare research budgets among competitive countries; France is found to be

lagging. The claim that these indicators became conflated and represents a morphing discourse is supported, in part, by the sheer pervasive diffusion of this conflation. The concepts of high technology and productivity are used interchangeably in policy documents, and the French government created new institutions to support innovation and the development of high technology. In addition, new statistical measures, focusing on R&D investments and more, are created in order to assess the country's relative position. New institutions and statistical measures were created in order to accommodate the morphing discourse, and older, established institutions, such as universities, were ascribed new roles, as well; the entrepreneurial university became charged with a kind of knowledge production that would render France "competitive."

The spread of new ideas can be tied to the scientific discourse, which arguably began to focus on "technology" with the publication of Solow's famous 1957 article. Subsequent important work (Griliches, Fall 1988) began factoring R&D into productivity growth equations. Most importantly, with the advent of the IT "revolution" and attendant elusive productivity growth, academic and business school elites shifted their research focus to firm-level data and firm performance in an effort to capture presumed (or latent) gains. The spread of ideas from academic and business elites to policy-makers is suggestive of a "productive' discourse.

Evidence of a shift and implications. Even though it is clear that the discourse is "productive" as evidenced by its pervasive spread, it could be argued that the 1980s discourse appears little changed from the early postwar years. New terminology, such as competitiveness, innovation and high technology, has infiltrated the discourse, but does this "new language" really represent a shift in social meaning? Moreover, this dissertation claims that the discourse shifted from a focus on production processes to products; however, the 1980s technologies figuring so importantly in public debates, such as information technologies, work to streamline production processes, as well as serve consumer needs. Last, competitiveness may not have been mentioned explicitly during the earlier discourse, but its message, as

revealed by the continual comparisons of absolute productivity levels and productivity growth among countries during the early postwar years.

But, an analysis at this broad level obscures how seemingly subtle and inconsequential small changes in discourse can produce important differences in outcome. *Outcome in this dissertation is what countries privilege when attempting to pass key pieces of legislation or promote policy goals*.

The new rhetoric does represent a significant shift in meaning. A conflation of terms, as Krugman notes, muddles policy choices: do we want to promote efficiency or trade? Productivity has a number attached to it, contested though it might be. What is the outcome for innovation or competitiveness? Like for productivity, proxy numbers must be selected to define them. Intuitively, policies would differ whether production cost savings, R&D expenditures, market shares, or exports are targeted. Cost savings come up, always in the equation, but in the 1980s, cost issues are linked to non-explicit sources (investment in innovation will enhance productivity, thereby lowering costs); during the early postwar years, wages and labor issues are specifically targeted.

In France, during the early postwar years, plant modernization counted as a priority and it continues to figure in the 1980s parliamentarian debates. But, the two discourses are, in fact, not the same and for two main reasons. The first, and most important, is that the French plans and public debates make it clear that the central players mandated to carry France to higher planes, or stave off decline, are firms and entrepreneurs. The rhetoric of firms and entrepreneurs is everywhere present in the 1980s discourse; it *is noteworthy* that the French government commissioned the US management consulting firm, Boston Consulting Group, to help with the drafting of the eighth plan. The focus on firms, most decidedly, shifts the focus onto competitiveness, rather than process.

During the early postwar years, the French government promoted industry concentration and production standardization. By the 1980s, information technologies were certainly enlisted to streamline production

processes, but "high technology" simultaneously began to be associated with new "knowledge-based" products. A personal computer may or may not derive from more "knowledge" than a television set, but the point is immaterial. The rhetoric of "high technology" allures and moves; it presents a new call for action.

The new focus on entrepreneurs is additionally exposed in the way that the planning process, itself, now becomes contested. Do entrepreneurs need national plans in order to run a competitive business? Some French parliamentarians think not. The shifts, from process to product, from national aggregates to firm-level data, from national authorities to entrepreneurs parallel one another. Together, the shifts bear important implications for policy directions and new economic *modus operandi.* Policies focusing on R&D expenditure, for one, are far less specific in their effects than policies to, for example, standardize production processes and concentrate industry. Basing policy on firm data, rather than national aggregates, would have the effect of diffusing outcome measures, evidenced most clearly by the new statistical series produced by Eurostat. Finally, bringing entrepreneurs front and center of economic planning and debates provide new authority and power to these individuals, relative to the power erstwhile held by political and academic elites. The latitude granted to the running of nationalized industries during the 1980s, provides one example of "business over politics."

Last: focusing on "innovation," however linked with productivity, *does* convey a different social meaning to productivity, compared with one that focuses on productivity alone. The former gauges progress in terms of what we can do, while the latter promotes efficiency as a source of progress and social salvation. The two meanings are not the same, and they do not represent the same underlying social values.

2. The rhetoric of productivity moves policy forward. As productivity growth was noted to slow in France, policymakers championed innovation and high technology as a way to regenerate the country and make it competitive on the newly globalizing world market. High technology became a new, supporting term in the productivity discourse, and it garnered support across parties, as evidenced by its diffusion in the eighth plan, under a center-right government, and again in the ninth plan, drafted by the socialist

government. What is cross-cutting, facilitates policy passage. Moreover, the deployment of new, arguably alluring rhetoric ("innovation" and "high technology") suggests that rhetoric is at work pushing ideas forward, not a structural constraint, or an economic law that organizes societies in an inevitable manner. The fact that "high technology" could not be defined or properly differentiated from "ordinary technology," but still resonated across party lines, lends support to the claim that words and ideas are at work.

The rhetoric of competition and numbers, as before, played a critical role in benchmarking goals and objectives, with the main reference countries being the UK, US, Germany and Japan. With the newly conflated and popularly appealing rhetoric, France successfully increased its commitment to R&D spending as a percentage of GDP, for one. The new discourse heaped attention on the competitiveness of individual firms, with nationalized companies receiving infusions of resources to step up their capital formation, as one example. By contrast, distributional issues, such as the 35-hour workweek – though technically related to productivity growth – failed to gain traction and become law; even socialist parliamentarians privilege growth over shorter working hours. This one example illustrates the power of numbers rhetoric to not only push policy forward, but to selectively block policies that could place France at what was perceived to be a competitive disadvantage. The French state, and its relative burden on private incomes, is compared with competitor nations, but the link to productivity and competitiveness is not sufficiently strong to resonate across party lines. In fact, the prime minister legitimizes the planning process by linking it to the rapid gains in growth achieved under the earlier Monnet plans.

3. Contestation and implications for the rhetoric of productivity. Contestation in the debates, as well as the remarks that are issued by the Economic and Social Council, center on distributional and employment concerns, as well as institutional structures such as nationalized industries and the planning system itself.

As during the early postwar years, "technology" presents an employment dilemma; no one is against the deployment of new technologies in industry, though labor representatives typically express concern about employment displacement and guarantees that must, consequently, be secured for the work force. The fact

that a 35-hour workweek is contentious and, in fact, never materializes as law, suggests that contestation on this front cannot compete with the "politics of more." On a subtler, and more fundamental level, the French Economic and Social Council queries the extent to which new technologies have translated into a higher quality of life, or standard of living, or delivers new employment opportunities. Contestation at this level suggests that what we take for granted, in a "common sense"[1281] fashion, is not inevitable. The query fails to gain traction at this time, though it exposes the opportunity for a transfiguring discourse to develop.[1282]

Union members charge that insufficient attention is being paid to nationalized industries, arguing that the economy operates "efficiently" only when oversight and resources extend to all parts of the whole. On the opposite political spectrum, contestation is leveled against the planning system itself, an anachronism in an era of newly emerging neo-liberal ideas in France. Planning, it is claimed, cannot save employment loses linked to innovation and new production processes that inevitably occur during the short run. Over the long run, the market will reach its own proper equilibrium. The challenge to the planning process also exposes vulnerabilities in the discourse. Still, the claim that state involvement may hinder productivity growth and is, at least, not helpful to entrepreneurs, now leading the charge for economic growth and global competitiveness, does not at this time resonate across party lines. The planning process is connected with distributional issues in France, as well as economic oversight, which work to obfuscate its role, making it less vulnerable to transfiguration.

[1281] See discussion of Gramsci in chapter 3.
[1282] The discourse on environmentalism that developed later is, arguably, a case in point.

Chapter 10: The 1980s-1990s: the productivity of knowledge (United States)

United States: what theory tells us to anticipate as productivity growth rates decline

It was argued in the section covering France that, during the late 1970s and into the 1980s, the two countries were facing similar challenges from the global economy, with both the US and France posting low productivity growth. This dissertation does not make the claim that slowed productivity growth, on its own, created a shift in the discourse. Rather, the argument being made is that slowed productivity growth, at a time when information technologies were spreading rapidly in economies and anticipated to boost productivity growth, placed the discourse under strain. And, the strain was felt both within scientific and policy circles. With regard to the former, it has been shown that economists and a newly emerging group of productivity experts from high-profile business schools began parsing firm-level data in an effort to discern lagged organizational and learning effects of the new technology. New measurements, including the role played by intangible capital, were factored into equations in order to bring productivity growth out of its hiding.

Within policy circles, slowed productivity growth compared with countries, such as Japan, ushered in prompt calls for action to prevent decline. Productivity, once again, served as the alarm, but this time, the US was not the undisputed leader; eyes turned toward the Pacific and US policymakers, like those in France, revealed new curiosity about how other countries organized their economies. At this time, the driver of discourse, as discerned from policy debates, wobbles between new production processes and "knowledge-based" products. New production processes involve the use of new technologies; discussions about wages and labor costs no longer color public debates. Ordinary material products have lost allure. High technology, never defined or benchmarked, is the new purveyor of rescue.

As noted in the overview, in an article published during the early 1990s, economist Paul Krugman suggests that both policymakers and academic economists erroneously conflated productivity and competitiveness.

In France, the word "productivity" nearly disappeared from the discourse; policy focus was trained on competitiveness. As in France, competitiveness and the link with individual firms is prominent in the 1980s to 1990s in the United States. Why new performance measures become linked with productivity cannot be proven; however, as argued during the beginning of this chapter, it would not seem counterintuitive to suggest that sagging productivity levels at a time of "technology revolution" may have weakened the case for productivity measures. Or, slowing growth may simply have sounded the alarm to what was most feared: competition from the outside. Alternatively, the increasing focus on firm-level data, compared with national aggregated measures, may have encouraged a "looser" discourse, per the rhetoric of entrepreneurs and management consultants, now wending their way into the morphing discourse. Whatever the root cause, the conflation is marked in US public debates. The claim being made is that this focus on competitiveness ensured that policy focus would remain on products and the viability (which would be benchmarked with new measures, such as profits and market share) of US firms producing "high technology," or "knowledge-based" consumer goods for the rapidly globalizing market – and not always domestically.

As in France, then, we would anticipate a policy shift in the United States, reflecting these changes – or at least challenging the discourse then in place. In the US, with low levels of productivity growth, as in France, we would expect policymakers in the US and other elites – economics scholars investigating new productivity models, for one – to begin generating new ideas that corresponded to a newly challenging social context. Although French elites were more likely to question US policy in light of the fact that the US was not faring better than France, and had lost some of its hegemonic status by virtue of new viable competitors (e.g., Japan) on the global market, the US still maintained a position of power relative to France. In fact, it was shown that French policymakers continued to refer to the US when gauging their own position in the international economic order. And, so, we would anticipate that the US would play a driving role in terms of shifting the discourse.

As in France, we would expect US policy initiatives to reflect a discourse that loosely linked competitiveness, innovation and high technology to productivity. Institutional changes supporting such transfiguration in the discourse would lend support to a key claim in this dissertation linking discourse and ideas to structural transformation. More specifically, because the United States is presumed to be a liberal market economy,[1283] we would expect strong government intervention in any proposed economic process and policy to be a source of contestation in the congressional hearings. The legitimizing appeal of competitiveness and productivity – and their link – ought to overcome objections and provide cross-cutting support for legislation being pitched under their banner. Contestation might also come from elite economists, whose ideas run counter to the newly emerging discourse on productivity.

Productivity performance and the American economy

During the same year when hearings were well under way on HR 6910, or the National Technology Foundation Act of 1980[1284] – but before the Act passage – the US Congress convened to debate HR 6462, "Productivity performance and the American Economy."[1285] William S. Moorhead, Chairman of the Subcommittee on Economic Stabilization, opens the hearings by declaring, "The subcommittee begins today a series of hearings on how the Government is organized and what it can do to help remedy our increasingly serious productivity problem…A better productivity performance across the economy is not only necessary in order to enable this country to compete internationally and to reduce the inflationary impact of higher wages; it is also the only way to we can resume our historic trend toward a rising standard of living."[1286] In this passage, the reason for the alarm is clear. The claim defines the importance of productivity for the economy and wellbeing of the American economy – as it had long been described. The statement also reflects the organizing power of the concept on government, and it links to competitiveness. Representative Stanley Lundine[1287] adds that low productivity growth weakens the dollar by diminishing the competitiveness of the American products, thereby thwarting the balance of trade, and the complexity

[1283] Per the classification of Hall and Soskice (2001).
[1284] The Act is discussed in detail in the following section.
[1285] United States (1980), Congress, *Productivity performance and the American economy,* Hearings, June 24, July 29 and 31, August 27, 1980, 96th Congress, second session, Washington DC: Government Printing Office.
[1286] Ibid., p. 1. William S. Moorhead served the US Congress as a democratic representative from 1959-1980. See: http://bioguide.congress.gov/biosearch/biosearch1.asp for all biographical information concerning US congressmen.
[1287] US congressman Stanley Lundine was a democratic representative for New York from 1975-1986

and elusiveness of productivity suggests that a "single cure" of cutting taxes will not suffice.[1288] Lundine goes on to claim that investment in education and skills has added productivity gains, though net growth has declined, and concedes that economist Edward Denison[1289] does *not* attribute the productivity slowdown to levels of R&D in the United States (but notes that policymakers do believe this). But, the congressman urges, not knowing exactly what causes productivity growth does not imply no need for action: the government can invest in human resources, enhance capital formation, speed commercialization of knowledge advances and diminish regulatory burdens.[1290] Is this the magic formula? It does not matter, for productivity is so much seen as a key to all that ails or heals America that policy in its name is potent. In fact, Lundine is lukewarm to the bill under consideration, which aims to strengthen the mandate of the National Productivity Council.[1291] He suggests greater government intervention may be warranted, including "… reindustrialization policy coupled with economic planning."[1292] Such a view is directly countered by Republican representative Richard Kelly,[1293] who agrees that productivity is key to "competitiveness,"[1294] but decries government policies that have stalled productivity growth: "Our Federal government has pursued a policy of ever increasing spending and taxation, drying up profits and savings."[1295] The debate sounds familiar to that for the French ninth plan in the National Assembly: productivity (or competitiveness) must increase; this call to action is cross-cutting. How the state should play a role in this process is contentious.

But, as the hearings proceed and productivity continues to be conflated with competitiveness, what becomes apparent is both confusion as to *what* produces productivity growth and the *real* driving force of what is being *measured* – it is how the United States is faring comparing to other countries, not the living standard, per se. In an exchange between the Assistant Secretary for Productivity, Technology and

[1288] United States (1980), pp. 13-14. This comes from a statement issued on June 24, 1980.
[1289] Denison's contribution to the productivity debate in discussed in chapter 3.
[1290] Ibid., p. 15
[1291] The National Productivity Council was first established in 1978 and chaired by the Director of the Office of Management and Budget See: http://archive.gao.gov/auditpapr2pdf2/112091.pdf
[1292] United States (1980), p. 17
[1293] Richard Kelly was a Republican representative serving Florida from 1975-1980.
[1294] Ibid., p. 79
[1295] Ibid., p. 80

Innovation, Dr. Jordan Baruch, and congressman John Lafalce,[1296] it is clear that both agree on the "inextricable" relationship between productivity and trade, and that competitiveness on world markets depends on productivity growth at home.[1297] But in the exchange the congressman suggests that productivity may not be the proper "yardstick" of comparison – the figures are not as abysmal as the US overseas market shares, which should ring alarms and spur action. The assistant secretary agrees, noting that productivity is not the only important component of competitiveness; the US has lost market shares because of competition from countries producing higher-quality, longer-lasting products, and such is what the consumer demands.[1298] But, as Krugman has noted, a country need not run a trade surplus to be healthy, necessarily[1299] – adding the trade issue serves to muddle the debate, but it provides more push for action. If the terms are inextricable, then policy goals risk being compromised: either you promote trade or productivity, depending on how you define the latter. Congressman Bruce Vento[1300] suggests that American entrepreneurs have no incentive to produce for small, disparate foreign markets: "Why risk devising products for 20 different markets in Europe which have slightly different needs and requirements and regulations, as opposed to one large market back home?"[1301] From here, Vento asks for confirmation that the absolute level of worker productivity in America is the highest in the world, and Dr. Baruch affirms this to be true, adding that concern is about productivity growth, not absolute levels.[1302] Even were absolute levels comparable, the point that needs to be understood by this exchange is how far the concept of productivity has deviated from a notion of efficacy and how it does its work at just about any level: should we trade with Japan?

The elusive nature of productivity growth is well represented by the many references to what it is thought to mean, or how it is to be achieved. Elmer Staats, Comptroller General of the United States, for example, charges that the current National Productivity Council has failed to encourage productivity growth through

[1296] John J. LaFalce was a Democrat, representing New York form 1975-2002.
[1297] Ibid., p. 71
[1298] Ibid., p. 71
[1299] Krugman (1994), pp. 30-31
[1300] Bruce F. Vento was a representative of the Democratic Farmer Labor Party for Minnesota, 1977-2000.
[1301] Ibid., pp. 72-73
[1302] Ibid., p. 73

wage and price standards[1303] – in this case, wage levels determine productivity, rather than the latter determining the former – as is more typically claimed in the economics literature. It seems as if anything goes. In a quote from I. W. Abel, past president of the United Steel Workers of America, productivity is achieved by "… eliminating waste, using better equipment, improving worker morale, using more efficient manufacturing processes, working smarter – not job elimination or speed-up."[1304]

Lester Thurow, Professor of Economics and Management[1305] at MIT, was called as an expert to testify at these hearings and in fact lends legitimacy to this notion that productivity is everything and whatever we can do to "go further." Thurow suggests that the reason for the productivity decline is multiple: "It is essentially 1,000 cuts and the patient is bleeding to death for many different reasons."[1306] Thurow attributes much of the decline to a switch in industrial mixes, with postwar productivity growth linked to the moving of workers from agriculture into manufacturing. He then explains part of the decline to the removal of crop controls in the early- to mid-1970s, bringing less productive land into use. But he then questions a large loss in construction productivity: from 1954 to 1977, construction output was recorded at having increased by 58 percent, with construction materials increasing by 133%. Thurow is at a loss for why building required twice as many materials in 1977 compared with 1954.[1307] He then cites the example of adding 150,000 private security jobs in 1972, which would have the effect of adding hours, but no increased output.[1308] The cuts are many: how is policy to be fashioned on the basis of these numbers and multiple explanations?

[1303] Ibid., p. 84
[1304] The quote comes from a brochure from a non-profit organization, "American Productivity Center," inserted in the hearings proceedings. Ibid, p. 157
[1305] Linking economics with management is also evidence of the shift in "who" now has "authority" to speak about productivity and helps provide evidence for the shift in how productivity became to be conceptualized in the 1980s and 1990s.
[1306] Ibid., p. 184
[1307] Ibid., p. 185
[1308] Ibid., p. 186. Theoretically, these hours should be accounted for in GDP figures, which include services. Thurow's point, then, doesn't explain the lowering of productivity figures, but Thurow may be highlighting how we tend to associate productivity with the production of "things."

In fact, during these hearings individuals speaking on behalf of Japanese and German productivity achievement were called as experts. Mr. William H. Tanaka,[1309] for example, was asked to comment on the strong productivity performance evident in Japan at this time, when rates for many industrialized countries had slumped. Mr. Tanaka responded that three main factors contributed to the country's success, the most important being the fact that Japan's industrial base had been destroyed during World War II: the country was able to take advantage of proven technologies, "… to achieve rapidly a high degree of *competitiveness* with the more established industrial powers."[1310] Tanaka suggests that Japan's social and economic attitudes – including a privileging of consensus and job security – also work to the country's advantage by cementing relationships between management and labor. Last, Tanaka claims that Japanese industry has a longer-term perspective, helping it to target growth industries and, interestingly, looks to anticipate consumer demand and develop existing technologies to meet that demand – rather than rather stress innovation to create demand.[1311] Like in both the US and French debates, the merits of indicative planning are discussed – something that Tanaka claims the American public misunderstands.[1312]

This testimony suggests a historically contingent reason for why Japan was thriving at the time – it may not be altogether different from the experiences in both France and the United States: satisfying repressed demand is surely a spur to growth. Is it productivity? The fact that growth is linked to consumer satisfaction, not raw technology or innovation, per se, provides another example of ambiguity. Do we need innovation to develop more efficient production processes, or does technology create new consumer demand, or both? The testimony also describes the merits of Japanese institutional configurations, such as the "internal labor market" of individual companies[1313] and MITI. These two, although not directly comparable to the US social context, could well claim a portion of the 1,000 cuts: achievements in productivity are elusive and far-reaching. The discourse on productivity is powerfully legitimizing, but

[1309] William H. Tanaka was an attorney with Tanaka, Walders and Ritger in Washington DC at the time of the hearing.
[1310] Ibid., p. 218. Emphasis added.
[1311] Ibid., pp. 219-220. In a statement by Donald Ephlin, Vice President, International Union, United Automobile, Aerospace and Agricultural Implement Workers of America (UAW), cited a study showing that unionization, and the job security that follows, causes a 20-25% jump in productivity compared with "…otherwise identical unorganized workplaces" – yet another claim for the US. Ibid., p. 267
[1312] Ibid., pp. 221-222
[1313] Ibid., p. 219

policies to promote it are unlikely to cover all of the "cuts," either across time, countries, or industries. The testimonies presented here underscore the myriad factors associated with productivity promotion, as well as attest to the moving power of declining productivity growth rates: they provide the call for action. Action requires some degree of consensus, though.

Legislation to promote innovation and technology transfer

Stevenson-Wydler Technology Innovation Act of 1980. Shortly after these hearings on the productivity performance of the United States, the Stevenson-Wydler Technology Innovation Act[1314] was passed. The major components of the act are as follows:[1315]

1. Directs the Secretary of Commerce to establish and maintain an Office of Industrial Technology
2. Establish Centers of Industrial Technology, to engage in:

- Research supportive of technological and industrial innovation, including cooperative industry-university basic and applied research;
- Assistance to individuals and small businesses in the generation, evaluation, and development of technological ideas supportive of industrial innovation and new business ventures;
- Technological and advisory assistance to industry; and
- Curriculum development, training instruction in invention, entrepreneurship and industrial innovation

These centers are to partner with a university or other non-profit organization, with "planning grants" being made available to help centers map out their activities and contractual agreements with partners. The act also details provisions under which these centers can acquire titles to patents and rights to inventions, at least partially supported by federal funds.[1316] Finally, the act specifies the role to be played by the National Science Foundation (NSF) in providing the planning grants. The act, then, serves to empower existing institutions, such as the NSF, as well as create new ones, such as the Centers of Industrial Technology. The act, in fact, bears an odd resemblance to France's ninth plan, debated in parliament three years following

[1314] Adlai E. Stevenson III was a democratic Senator representing Illinois from 1969-1980 and John W. Wydler was a Republican representative for New York from 1963-1980.
The bill became public law on October 21, 1980. See: http://thomas.loc.gov/cgi-bin/bdquery/z?d096:S1250
[1315] Ibid., pp. 1-2
[1316] Ibid., p. 1

the enactment of Stevenson-Wydler, at least in terms of what was detailed as investment priorities. In both cases, governments are moving to promote research and innovation by helping to create links between industry, individual firms and non-profit research bodies, such as universities. Here again, the flow of ideas across the Atlantic is apparent: differences can be parsed, but the main point is that discourse revolves around the very same ideas, concepts and language, even.

Congressional hearings relating to Stevenson-Wydler began in spring 1979 and continued until fall 1980. The list of experts called upon to testify involve a mix of federal government officials, local and state government representatives, as well as representatives of industry and university departments – professors of engineering and research development departments have seemingly taken the place formerly dominated by professors of economics during the early postwar hearings on labor legislation revolving around production issues. One exception includes the testimony of Dale Jorgenson, Harvard University economics professor, whose work on productivity had long been influential in the field. Industry representatives included R&D experts from Xerox Corporation, Monsanto, IBM, US Steel Corporation and Bethlehem Steel Corporation. Roles played by particular institutions, such as MIT are also noteworthy – at least 7 experts affiliated with MIT are called to testify during the course of these hearings – the only university providing multiple witnesses. MIT has long played an important collaborative role with government in terms of technology development,[1317] and it comes as no surprise that the institution would continue its influential role in framing legislation about technology and innovation during the 1980s and beyond.

The first day of hearings on the general theme of technology transfer opens with a series of statements by federal government officials dedicated to the theme of technology transfer and sharing. In the first statement, Alfonso Linhares, Chief, Technology Sharing Division from the US Department of Transportation, defines technology sharing as a process through which federal research can be made available for application at the state and local level; technology sharing is considered to be commensurate

[1317] See the discussion in chapter 2 regarding the work of David Noble (1984).

with technology transfer.[1318] Such – admittedly prosaic – themes continue throughout the hearings, but technology transfer at these different levels of government is important to the act, as are links between industry and universities, which is the subject of hearings held in June and July 1979 on "the role of federal laboratories in domestic technology transfer."[1319] Such at least demonstrates the mechanism through which ideas on technology and innovation are to be disseminated throughout the economy – much as ideas on productivity (and later innovation) were to spread across France: through "productivity centers" and links between industry and government. A congressman asks whether the diffusion of federal technology will generate productivity or economic growth – to which the Baruch assures that such activity will generate "enormous returns."[1320] Dr. James Shamblin, director of a Center for Local Government Technology at Oklahoma State University states it clearly: wherever technology transfers reduce budgets or increase productivity deliver "credibility"[1321] – this is the outcome by which to judge success. Congressman Wes Watkins sums it up as well: technology transfer between the Federal government, private industry and universities "… is very crucial for productivity and for getting the most out of our tax dollars."[1322]

A following hearing devoted to the workings of the National Technology Innovation Act, as it has been called, makes the link between innovation and productivity explicit. In the first 50 pages of hearing, the word "productivity" is cited at least 48 times. In an opening statement by one of the act's initiators, Senator Stevenson, the link is made clear. Not only will the act help industry and universities to generate new market-driven technological ideas, it will also improve the government's ability to discern "… the technical and economic conditions that determine productivity, employment, and trade performance in certain sectors."[1323] The motivation? The US' ability to innovate in a "relevant capacity" is in decline.[1324] What is

[1318] United States (1979), Congress, *Technology Transfer Conference,* Hearing, March 30, 1979, 96th Congress, First session, Washington DC: US Government printing office, pp. 22-23
[1319] United States (1979), Congress, *Role of the Federal Laboratories in Domestic Technology Transfer,* Hearing, June 12-14, July 10, 12, 1979, 96th Congress, First session, Washington DC: US Government printing office.
[1320] Ibid., p. 568
[1321] Ibid., p. 618
[1322] Ibid., p. 619. Wes Watkins was a democratic representative for Oklahoma from 1977 to 1990, elected as a Republican from 1997-2002.
[1323] United States (1979), Congress, *National Technology Innovation Act,* Hearing, June 21, 27 and November 21, 1979. 96th Congress, First session, Washington DC: US Government printing office, p. 1.
[1324] Ibid., p. 1

relevant is what renders the United States competitive with other countries: productivity does not mean what is efficient, but what is marketable.

A description of Senate bill 1250[1325] reiterates that the purpose of the bill is to promote innovation that will positively affect productivity, employment, and economic competitiveness.[1326] In these opening pages, no mention is made of how innovation might contribute to more efficient production processes – the bill aims to facilitate commercialization of new products, full stop. Productivity, most recently defined by the real output of marketed material goods, is essentially the same: the product mix has changed, per international demand: products now contain more intellectual product. Such is well stated by the first expert to be called, J. Herbert Hollomon[1327] from MIT: "The introduction of new and improved products and services, sometimes derived from advances in science and technology, provides an important basis to meet the needs of society, increase productivity and wealth of the nation and enhance the health and welfare of its citizens."[1328] In fact, Hollomon lends credence to the shifts identified in this study when he suggests that the use of technology – the analysis of its use – was eclipsed during the postwar years due to the push to satisfy consumer demand of material products. He also refers to the *productivity* slump, evident since the 1970s, as a motivating source for new thoughts on how to improve US *competitiveness.* New technology is key, and government can help.[1329]

It is ironic that the centerpiece of the proposed legislation aims to enhance university-industry partnership, as a way of privileging applied over basic science.[1330] In fact, Hollomon suggests that the act will completely reorient university curricula – such amounts to a major shift. Regardless of whether or not a new university orientation makes good policy sense or represents a proper way to keep an economy growing, the *counterfactual* that needs to be asked is: What if the legislation had been named the

[1325] The bill was later to be enacted as the Stevenson-Wydler Technology Innovation Act of 1980.
[1326] Ibid., pp. 9-10
[1327] Dr. J. Herbert Hollomon was a Director, Center for Policy Alternatives, at MIT during the time of the hearings.
[1328] Ibid., p. 18. Monte Throdahl, Vice President, Monsanto Co. reiterates this theme when called to testify: "The whole purpose of the bill … is to convert selected information into new products, new services, and bring those to the public." Ibid., p. 35
[1329] Ibid., pp. 19-20
[1330] This point is also evident in Dr. Hollomon's testimony. See, for example, Ibid., pp. 22-23

Stevenson-Wydler Applied Technology Act? The bill might not have passed. An explanation might be that it is too measurable, too concrete and devoid of ambiguities: high technology and innovation, by contrast, much like competitiveness and productivity, can mean everything and nothing – they are alluring concepts that legitimize action. What is elusive is hopeful. Applied technology? It might refer to new kinds of car brakes. Why is this important? Because universities had largely been places of ideas – knowledge for knowledge's sake. To recreate the ultimate mandate of the university as one that spins ideas for industry required the lofty and urging rhetoric of innovation, technology, productivity and competitiveness in order to make such a consequential shift, or such is the claim made in this analysis.

With a change in mandate, universities needed to become entrepreneurial, which is why such a great section of the hearings and testimony from experts deals with licensing and patents. This is the subject of discussion by Throdahl from Monsanto, for example, whose company partnered with Harvard Medical School to research and produce a biomedical product. In this case, the university was provided funds for the research, Monsanto was granted exclusive commercialization rights, while the Harvard group had royalty rights for any patents awarded.[1331] These are the mechanisms at work to help foster a new relationship between industry and academia and to help generate innovation that will improve productivity and the wellbeing and competitiveness of the country. MIT and Stanford are mentioned as models, which are "… causal in the development of new companies."[1332] But even spokespersons from MIT declare a need to shift their focus from federally funded projects towards the private sector by interacting more closely with industry.[1333] A further shift to note is a new role to be played by management experts. Dr. David Morrison, Director and Executive Vice President of the Illinois Institute of Research suggests that the technology centers "… can prepare business, marketing and financial plans; they can recruit the managers; they can obtain the venture capital and employ management services during the startup period."[1334]

[1331] Ibid., p. 34
[1332] This remark is made by Dwight Baumann, Professor, Center for Entrepreneurial Development, Carnegie-Mellon University. Ibid., p. 102
[1333] Such is suggested by Dr. Nam P. Suh, Professor Director, Laboratory for Manufacturing and Productivity, and Professor of Mechanical Engineering, MIT. Ibid., p. 130
[1334] Ibid., p. 125

The causal link between technology, innovation and productivity is not clearly articulated in these hearings,[1335] and as noted, they are often mentioned in conjunction with one another, but Dr. Hollomon, delivers a statement in support of small firms that nearly make it sound as if the promotion of productivity comes at the expense of innovation: "… a large firm in a mature business, has to tend to its knitting, has to gradually improve its product and improve its productivity and will devote itself so intently to that, that new ventures must be specially supported to stimulate the new."[1336] In this way, he reasons, job creation typically comes from small firms.[1337] Most of the bill, as written for this hearing, explicitly and in multiple passages, links innovation with productivity, while here it would seem to be separate, if not mutually exclusive; such an exchange underscores how productivity's particular role and how it may or may not be linked to innovation is obscured in debates.

The promotion of innovation as a generator of new products and services for the economy, as a causal relationship, is more contested. Still to be legitimized is the role to be played by the government (as what surfaced in the French debates on the ninth plan). Interestingly, Senator Stevenson opens the debate by describing processes of innovation as complex and that the global marketplace is now "… influenced by many persons, by forces which were never recognized by Adam Smith – and still aren't by his descendants. It's influenced by governments, by religious movements; it's a creature of history, politics, resources and scarcity of resources – of forces for which there is very little precedent."[1338] Stating that times are extraordinary, as was claimed in the French debates as well, typically provides an entrée for government involvement. Stevenson, in fact, reminisces about "creating a market" for short-haul commuter aircraft, after Congress had deregulated the airline industry: "So, we called NASA, for which we have some jurisdiction. I suggested that they devote some attention to assisting industry with developing the whole new generation of aircraft, not only for the United States, but for the world markets."[1339] In fact, this example shows that government collaboration is really "business as usual," with Senator Stevenson citing

[1335] Dale Jorgenson describes the links later in the hearings, which is covered in this chapter.
[1336] Ibid., p. 51
[1337] And innovation from small firms is to be supported by this act, as the French ninth plan had outlined for small firms, as well.
[1338] Ibid., p. 53
[1339] Ibid., p. 54

the partnership between Japanese industry and government that has resulted in Japan's becoming a knowledge-intensive country, now ahead of the United States.[1340] Although the precise role of the government is questioned in these debates – as well as what exactly defines *laissez-faire* – thee contestation regarding state involvement is muted compared to that present in the Taft-Hartley debates. Though, regarding the latter, it bears remembering that no consensus was ever reached regarding the way in which the bill would or would not increase government involvement in the economy.

The main point of contestation, in fact, comes from elite economists[1341] – formerly dominating the debates and legitimizing claims – who now allege that the government is wrongly focusing its priorities in aiding the process of innovation. Dale Jorgenson, Professor of Economics at Harvard University,[1342] for example, takes pains to parse the components of economic growth and downplays the role played by innovation. Jorgenson, in fact, attributes to largest role to capital formation (40 percent), followed by productivity change (30-35 percent), with the remaining cause ascribed to the number of hours worked and the quality of the workforce. Productivity growth, he notes, is linked to innovation – the decline in productivity (negative growth for the three years prior to the hearing) is attributed to "changes in technology" – full stop. A decline in capital formation is documented since 1973.[1343] Output per capita and the general "levels of technology" prevailing in the US are higher than in other countries – it is the two trends of slowing productivity growth and comparative technology levels that is creating the worry.[1344] In fact, Japan is noted to have a higher level of "technology"[1345] than the United States – however measured – in about one third of its industries; hence the need to discuss particular industries, not aggregates, per se.

Jorgenson dismisses the idea that the decline in productivity growth has anything much to do with inflation, running into the double digits, at that time, nor can excessive regulation be the cause; likewise, Jorgenson

[1340] Ibid., p. 55
[1341] Such as Paul Krugman and his doubts about the competitiveness discourse.
[1342] The wide contribution of Dale Jorgenson's work to development of productivity models and the debate thereof is covered in chapter 4.
[1343] United States (1979), Congress, *Industrial Innovation,* Hearing, 96th Congress, First session, November 14, 1979, Washington DC: US Government Printing Office, p. 70.
[1344] Ibid., pp. 70-71
[1345] The way in which technology levels are measured is not indicated in the testimony.

discounts the impact of a decline in R&D expenditures as a probable, or primary cause of the productivity slowdown (mainly because the decline in R&D expenditures is traced to government projects, not the private sector).[1346] Jorgenson, differing from conclusions reached in a later work by Griliches,[1347] places the blame squarely on the level of capital formation in the country, which correlates with productivity levels. Increasing capital formation will stimulate productivity growth *and* innovation, the link to the latter not being explained, which would seem critical to the argument. Jorgenson also attributes the productivity slowdown to higher energy prices, because these prices cause firms to substitute lesser-productive technologies in an effort to conserve energy than under conditions of cheaper energy sources – the mechanism is considered to be "mysterious."[1348] Nevertheless, government is focusing on the wrong set of issues, according to Jorgenson, who targets productivity growth as a way to demonstrate the point, not innovation, per se.

In fact, Jorgenson explains that that Japanese have yet to attain productivity levels reached in the United States – the reason for their "advantages" in automobile trade are instead attributed to lower costs, mainly in the form of lower wages. This argument makes plain the reason for why conflating the terms is misleading. If wages follow productivity levels, then it would suggest that competitiveness, or trade advantages, would be threatened by productivity, which is so often linked to competitiveness and innovation as well. Jorgenson is pessimistic about productivity growth in the United States, because the Federal Reserve Board is failing to promote investment and capital formation – it is a seemingly simpler solution to the problem than that proposed by the bill under consideration.[1349] At the end of his testimony, Jorgenson cites anti-dumping measures undertaken by the US, which effectively reduce the competitive pressures on steel, for example, to invest in technology and become competitive with the Japanese. Essentially, Jorgenson writes off such US policy moves as "backward-looking."[1350] Again, the argument pinpoints the danger of focusing on competitiveness. Investment in technology may make the US steel

[1346] Ibid., pp. 71-72
[1347] See discussion in chapter 4 on Griliches' 1988 work.
[1348] Ibid., p. 72
[1349] Ibid., pp. 75-76
[1350] Ibid., pp. 79-80

industry more productive, which then might enhance the competitiveness of the industry vis-à-vis other countries. But, conflating the two, or obsessing with competitiveness on its own, as Krugman later charges, can encourage dangerous policies. Hence: there is a wide level of consensus concerning the idea of innovation and productivity, competitiveness, as well, but what outcome is being measured and through what measures is strongly contested. Like in France with the ninth plan, contestation in the US revolves around the role to be played by government and the policies it promotes.

Dr. Bruce Hannay of Bell Laboratories[1351] articulates similar misgivings about the act. Hannay explains the effects of technological innovation are reflected in an expanding economy, the creation of jobs, new products and services *through* rising productivity.[1352] Unlike Jorgenson, Hannay describes the link between inflation and declining productivity as direct: low productivity has created high inflation, which is to be addressed by innovation. The US is lagging in innovation compared with other countries, although Hannay concedes that "innovation" is difficult to measure, with only rough proxies such as R&D expenditures – and *productivity growth* – available.[1353]

Getting to the central point of contestation, Hannay remarks that, "… there is complete agreement that free market forces are normally sufficient to stimulate innovation and specific Federal actions to stimulate the innovation process are not generally required."[1354] What must be addressed, on the contrary, are present *disincentives* to innovate. The three areas singled out as needing to be addressed: tax policy, regulation and patent policy. Tax policy centers around measures to alter depreciation allowances, making capital investment more attractive. Regulation, in a generic sense, is claimed to deter innovation – cost-benefit analyses are necessary to determine if the costs outweigh the benefits of regulation. Last, the non-exclusivity of the patent laws at the time of the hearing is deemed detrimental to the seeding of innovation. Is this a *laissez-faire* program for productivity-slash-innovation enhancement? Hannay goes on to describe

[1351] Dr. Hannay was Vice President for Research and Patents, Bell Laboratories, at the time of the hearing. Ibid., p. 128
[1352] Ibid., p. 129
[1353] Ibid., p. 129
[1354] Ibid., p. 130

his support for government programs encouraging cooperative research, as well as procurement programs to promote innovation. Technology transfer, by contrast, needs no government support.[1355]

Senator Stevenson sharply criticizes these claims, suggesting that any philosophy for which there is "complete agreement" probably represents a lowest common denominator of some sort. Stevenson mentions the free-market valuation of stocks, pointing out that price ratios for gambling businesses appear to be higher than those posted for IBM, Boeing and AT&T. What then does *laissez-faire* mean? According to Stevenson, "It suggests that if innovation and productivity, the creation of real wealth, and enhancement of our competitiveness are our objectives, it isn't a perfect way to make choices."[1356] All three concepts, again, are strung together, as though to add force to the real argument at hand: what role for the government? Stevenson again brings up the example of Japan, whose industry, he claims, to have benefited from government support and then further asserts that America's most "competitive and productive" industries are "high-technology" industries – precisely those that have gained the most from government support: computer, aerospace and agriculture.[1357] Tax concessions, according to Stevenson, indiscriminately cover industry, not necessarily those industries that can propel productivity growth.[1358] The discussion and arguments pivot around productivity, at every level. But the other side uses the argument as well: "… unless the type of tax changes we recommend are adopted quickly, it will be difficult to achieve the productive strength of the economy." These changes, Franklin Lindsay urges, are necessary to grow productivity, control inflation and compete in world markets.[1359]

In these debates, a second level of contestation is apparent, though it does not appear to resonate strongly with members of congress. In a testimony delivered by William Bittle,[1360] the labor economist levels the charge that the bill on the table reflects President Jimmy Carter's complete backing of corporate America's agenda: roll back of health-care and safety regulations, as well as reductions in capital gains taxation. How

[1355] Ibid., pp. 131-133
[1356] Ibid., p. 136
[1357] Ibid., p. 136-137
[1358] Ibid., p. 137
[1359] Ibid., p. 140. Franklin A. Lindsay was Chairman of the Board for Itek Corporation at the time of the hearing.
[1360] William Bittle represents the International Association of Machinists and Aerospace Workers and presented his testimony on behalf of William Winpisinger, President of the association. Ibid., p. 175

to innovate? Bittle believes that the decision to innovate rests with management, a function of "speculative variables" and more, but not of calculated risks and benefits.[1361] In fact, his reasoning suggests a fairly basic incentive to innovate: "The only reason for a prudently managed company to invest and develop new products or more efficient production methods is the realization that a competitor might do so first and thereby steal its market."[1362] Although such would be welcome, as a spur to progress, Bittle links the US decline in innovation and technological development to corporate concentration and unprecedented merger activity since World War II.[1363] In Bittle's view, this amount of corporate concentration confers a great deal of power to set prices and control the market. For Bittle, then, there is no *laissez-faire* economy, because there is no free, competitive market.[1364] One of Bittle's major concerns is simply that government funding for small- and medium-sized firms is insufficient to spur innovation and productivity growth, and big industry has no competitive incentive to do so on its own (or even with help).[1365] The energy crisis beginning in 1973, according to Bittle, exposes the ruse of American industry; production has been founded on cheap energy prices. Now, the decline in American industry's "productive efficiency" has been exposed.[1366] Here, yet another prescription for innovation and productivity growth: render American industry more competitive domestically, not just internationally.

Newsweek reprint on productivity presented at hearings

These notions – the elusiveness of productivity growth and the dubious efficacy of policies aimed at its promotion – were in the following year presented to the 96th congress.[1367] A copy of a 1980 *Newsweek* article was reprinted for this session, and the article is fair in covering the issues under debate at the hearing. In fact, the article includes interviews with the high-profile economists Paul Samuelson and Milton

[1361] Ibid., p. 176
[1362] Ibid., p. 177
[1363] Ibid., p. 177. Bittle claims that 88 percent of industrial assets belong to 1 percent of US manufacturing companies, which receive 90 percent of industrial net profits; these figures, he suggests contrast with those for 1960, when small- and medium-size firms commanded 50% of the country's corporate assets – figures to be parsed.
[1364]Ibid., p. 178
[1365] Ibid., p. 179
[1366] Ibid., p. 181
[1367] United States (1981), Congress, *National Technology Foundation Act of 1980,* Hearings, 96th Congress, Second session, September 9, 10, 16, 17, 18, 1980, Washington DC: US Government Printing Office

Friedman, with the latter dismissing Carter's program to address economic woes as "… an assemblage of all the things that are wrong with past government measures allegedly directed at improving productivity and employment."[1368] Regulation interferes with market mechanisms, according to Friedman, which hinders productivity growth by distorting incentives to invest. Samuelson, on the other hand, explains that, "Safety regulations and pollution controls do lower productivity as conventionally reported … but longer lives and purer air are part of what an affluent society will rationally want."[1369] Samuelson then goes on to claim that there has been no "quantum" leap in government regulation during the 1970s compared to the 1960s, insisting that regulation cannot be blamed for the downturn in productivity growth.[1370] Although there is little agreement about the role of regulation in terms of productivity growth, Samuelson is in fact addressing a more fundamental issue that is not very well covered in the hearings: productivity measures are socially limited in meaning because we are constrained by how we define "output," or the outcome to which the standard of living is measured. Such is not an esoteric idea or one that would create debate among economists – but the public, as evidenced in these hearings, largely seems to take the measure "productivity" for granted. Again, debates center on policies and the role of the state, not on productivity measures themselves or productivity growth as the ultimate indicator of economic wellbeing.

The *Newsweek* article states that "… Japanese workers widely accept the need to stay competitive by boosting productivity."[1371] But here the conflation and how this might lead to unwise policy is rather clear. Later in the article, it is pointed out that the US textile industry, ironically enough, had scored enormous productivity gains, being transformed from a labor- to a capital-intensive industry. But, the author article notes, the modern equipment is mainly imported from Switzerland, Japan, Italy and West Germany, diluting the "success."[1372] If productivity were the exclusive outcome to measure, the latter fact would be irrelevant, as Krugman alludes in his 1994 article. But, it is interesting from a theoretical point of view to

[1368] Ibid., p. 103
[1369] Ibid., p. 103. Ellipses in the original text.
[1370] Ibid., p. 103
[1371] Ibid., p. 97
[1372] Ibid., pp. 99-100

note the ease with which ideas float between the academic literature, hearings and the popular press – discourse seeps.

Towards the end of the hearings, Dr. Allen Rosenstein, Professor of Engineering at UCLA, provides testimony, stressing the need to apply technology, rather than invent. Rosenstein quotes Peter Drucker, who, according to the citation, believes that science can be purchased or imported. No modern country needs science, according to Drucker.[1373] Rosenstein then goes on claim that "… our trade innovation and productivity problems are but symptoms of a much larger and critical problem – the manner in which the country has organized its institutions."[1374] The statement summons thoughts about the varieties of capitalism literature and the role to be played by institutional structures in a country's mix of industrial specialization. But, as noted elsewhere in this study, productivity, as an outcome of interest, maintains a fairly low-level profile in this literature,[1375] which instead privileges "performance indicators" – or outcomes even less well defined than productivity measures, per se.[1376] These debates, in some sense, reflect this shift in explanations for what counts in terms of outcome observed, or desired. In this testimony, new institutional configurations – by design, not edict – could improve productivity growth by facilitating the appropriation of new ideas.

The hearings betray a conflicted view regarding what causes productivity, with many terms – competitiveness, innovation and technology – adding to a serial conflation of terms and ideas – nothing which really lends itself to clear, clean policy formulation. So what is the tiebreaker and why does the bill pass into law? As in past legislative debates, it is the idea of productivity, full stop. Competition is the threat and stepping up innovation, through technology transfer and the exchange of ideas, even at managerial levels, is the response. No consensus is achieved in these debates as to the surest path of

[1373] Ibid., pp. 106-107
[1374] Ibid., p. 108
[1375] As argued earlier in this chapter
[1376] Ibid., p. 108

success: is it tax policy, knowledge sharing, government-industry cooperation, or institutional reconfiguration? Without even remotely coming to a conclusion, the bill passes, no doubt because in the words of congressman Don Fuqua,[1377] "We need to do something."[1378] In helping to stimulate productivity and competitiveness, the bill co-sponsor, John Wydler, claims this legislation, "… holds out a great hope for the future betterment of the economic position in which our country finds itself."[1379] It is a democratically controlled congress, but the bill is co-sponsored by a Democrat and a Republic. Productivity provides hope for the future – it is the only cross-cutting idea expressed in the hearings, and it is a potent message that facilitates bill passage. In much the same way as seen in the Taft-Hartley debates, no consensus had been achieved regarding what path would lead to socialism or protect the US from its perils. But the idea that production had to go on was agreed upon by virtually everyone. Should America aid a war-devastated Europe? Would aiding Europe either prevent the encroachment of communism or would aid simply render Europe more attractive for communist control? On that issue, too, the vote was split. By providing a production benchmark, the action was neutralized, a clear mandate delivered and ambiguities eliminated.

Bayh-Dole Act of 1980. At the time of the Stevenson-Wydler debates, hearings were also being held with the aim of revising US patent laws, which later resulted in the Bayh-Dole Act of 1980. Unlike the Stevenson-Wydler Act, which was concerned with "intramural research," or research linked to federal scientists and institutions, the Bayh-Dole Act governs "extramural research," or research conducted by private institutions, but funded by federal sources.[1380] In this case, technology transfer refers to "… a process by which government-funded inventions are transferred to the private sector for further developments and commercialization."[1381] The act covers many details, such as the schedule of fees and other processes involved in patenting an invention. But the key organizing aspect of the legislation is that which, "Sets forth the policy of Congress to use the patent system to promote the utilization and marketing

[1377] Don Fuqua was a Democrat representative for Florida, from 1963-1986.
[1378] United States, Congress (1980), *Congressional Record -- House,* 96th Congress, Volume 126, Washington DC: US Government Printing Office, p. H-24564
[1379] Ibid. p. H-24567. John Waldemar Wydler was a Republican representative for New York from 1963-1980.
[1380] Andrew Z. Michaelson (2002), "The law of the lab: using Zerit to inform technology transfer." See: http://leda.law.harvard.edu/leda/data/512/michaelson.html, p. 4
[1381] Ibid., p. 2

of inventions developed under federally supported research and development projects by nonprofit organizations and small business firms."[1382] In 1983, President Reagan extended these rights by executive order to big business.[1383] As nonprofit institutions, both private and public universities are included among those institutions affected by this legislation.

The way in which technology transfer was to be encouraged was through the implicit approval of exclusive licensing, with clauses added to secure protection against abuses and promote what might be interpreted to be "social welfare."[1384] For example, provisions grant the federal government the right to use the invention and stipulate that the organization funnel royalties and earnings into further research and education.[1385] Provisions called "march-in" rights were included to ensure that the following criteria are met: (1) achieve practical application of the invention in its field of use; (2) alleviate health or safety needs; and, (3) meet requirements for public use specified by federal regulations and (4) achieve participation by United States industry in the manufacturing of an invention.[1386] These measures have been interpreted as assurances against delays in applying the invention for practice use and against exorbitant pricing schemes, resulting in windfall gains for corporations, though the latter is not explicitly defined.[1387] This portion of the bill was contentious and continues to generate controversy, in part because the government has never invoked the march-in rights clause.[1388]

Hence, even with the intent to promote commercialization, exclusivity, perhaps by definition, is bound by rules. And, as seen with the basic provisions of Stevenson-Wydler, the legislation reads blandly in its promotion of progress through technology transfer. Birch Bayh,[1389] a democratic senator and Robert Dole,[1390] a republican senator, cosponsored the bill that enjoyed wide bipartisan support.[1391] The fact that

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[1382] See the CRS summary at: http://thomas.loc.gov/cgi-bin/bdquery/z?d096:H.R.6933:
[1383] Michaelson (2002)
[1384] See CRS summary at: : http://thomas.loc.gov/cgi-bin/bdquery/z?d096:H.R.6933:
[1385] Ibid.
[1386] Ibid..
[1387] Michaelson (2002), pp. 11-12
[1388] This claim is widely acknowledged. See, for example: http://www.brandeis.edu/otl/pdfs/autmfall2006jour.pdf
[1389] Senator Birch Bayh served Indiana from 1963-1980.
[1390] Senator Robert Dole served Kansas from 1961-1996. See:

the bills were differently oriented, but achieved the same outcome – bill enactment – is important to note. Stevenson-Wydler promoted the role of the federal government to help organize technology transfer, concentrating resources in technology centers; big companies, as represented in the hearings, such as Xerox Corporation, IBM and Monsanto, were key to the plan. Bayh-Dole, on the other hand, aimed to decentralize technology transfer, by conferring commercialization responsibility for federally funded research to universities and small business.[1392] In these debates, no consensus is reached regarding the role of government or big versus small business in terms of generating productivity growth. But, both bills are enacted. What both bills shared was a response to declining productivity figures in the US. Again, something had to be done.

This sense of urgency is readily apparent in the opening hearings on the proposed act. At the outset of his statement, Senator Bayh first expresses his concern that "… the United States is rapidly losing its preeminent position in the development and production of new technologies…."[1393] The Senator then decries the US trade position vis-à-vis other industrialized countries, notably Japan and Germany – countries which are reported to be covering their oil imports from their export earnings.[1394] Then, the ultimate cry for action: "American productivity is growing at a much slower rate than our free world competitors."[1395] As with the French plans during the 1980s, as well as the Stevenson-Wydler Act debates, productivity, competitiveness and innovation are typically strung together to make the final push for action: "There is no engraving in stone from on high that we shall remain No. 1 in international economic competition … The University and Small Business Patent Procedures Act will be a step in the direction of encouraging innovation and productivity in the United States."[1396]

[1391] See, for example, Ashley J. Stevens (2004), "The enactment of Bayh-Dole," *Journal of Technology Transfer,* 29, pp. 93-99. See, also [1391] Sheila Slaughter and Gary Rhoades (summer 1996), "The emergence of a competitiveness research and development policy coalition and the commercialization of academic science and technology," *Science, Technology and Human Values,* 21:3, p. 322, for a list of votes for the two bills, showing overwhelming bipartisan support.
[1392] The contrast between centralizing and decentralizing research responsibilities of both acts in discussed in Stevens (2004), pp. 98-99
[1393] United States (1979), Congress, *The University and Small Business Patent Procedures Act,* Hearings, May 16 and June 6, 1979, 96th Congress, First session, Washington DC: US Government Printing Press, p. 1
[1394] Ibid., p. 1
[1395] Ibid., p.2
[1396] The statement is made by Senator Bayh. Ibid., p. 3

Senator Dole, in his opening statement, deploys similar rhetoric as that used by his democratic colleague. Dole stresses a few Republican themes, such as the need to counter protectionist trends and the bureaucratic red tape that was then considered a hindrance to effective patent policy. Still, he is unified with his colleague in that he insists, "… the answer to foreign competition lies neither in an increase of export subsidies, nor in an increase of tariffs, but in an increase in productivity."[1397] And later, Dole declares that "… the protection that patent rights for a limited amount of time would guarantee to American Business would be a giant step toward providing incentives for greater productivity."[1398] What about the role of government? Dole suggests that "Complex rules and regulations devised by Federal agencies are detrimental to stimulating productivity and enterprise … The almost adversarial relationship that now exists between business and Government must be replaced by a true and genuine partnership, a partnership in which the Government will act as impresario in bringing industry and universities together with new fields of knowledge and their practical implementation."[1399] The potential divide between democrats and republicans could not have been made clearer. And the bridging argument rests squarely with the notion of improving productivity growth rates – even if the means by which it is to be achieved is not made patently obvious. Congressmen delivering subsequent statements merely repeat these themes.

Dr. Willard Marcy, vice president of the invention administration program, Research Corporation,[1400] introduces an article by Peter Drucker,[1401] now a well-recognized name in these and related hearings, as support for his testimony. Drucker points to a growing antipathy between science, industry and government, "Yesterday's business, with its unified technology, organized around a process, such as making glass, was basically technologically oriented and therefore looked to science for its future."[1402]

[1397] Ibid., p. 29
[1398] Ibid., p. 29
[1399] Ibid., p. 29
[1400] Research Corporation, according to the witness, is a nonprofit organization, chartered by the state of New York. United States (1979), Congress, *Patent Policy, Part I,* Hearings, July 23, 27 and October 25, 1979, 96th Congress, First session, Washington DC: US Government Printing Press. P. 263
[1401] Drucker's ideas are referenced in other hearings, as well, and covered in this dissertation.
[1402] Ibid., p. 275. The inserted article is based on a letter delivered by Drucker to the American Association for the Advancement of Science (AAAS), January 9, 1979.

Firms, instead, are being encouraged by current regulatory and tax laws[1403] to invest in conglomerates as a way to secure financial earnings, whereas previously, according to Drucker, firms would base their investment decisions on productivity returns, which, formerly, was a spur to innovation. Antitrust laws exacerbate this negative trend by discouraging firms from expanding their business; to grow, firms have to form conglomerates.[1404] Knowledge for knowledge's sake, Drucker later states, is not socially or economically tenable; knowledge must have utility.[1405]

These assertions lend support to claims made in this study regarding shifts during the last century in the scientific and policy discourse on productivity. For example, Drucker identifies a shift away from the need to develop production *processes* to incentives encouraging firms to invest in conglomerates, groupings of businesses involving the production of diverse goods and services. During the postwar years, productivity was conceptually equated with lowering production costs, either through reorganization or through automation. Later, during the prosperous 1960 and beyond, productivity is seen in terms of "more" – more goods and services. Now, as Drucker point out, productivity can be restored through innovation – innovation that is applied and useful (so, product oriented, presumably). Even the fact that Drucker's article is presented at the hearing is noteworthy, because Drucker is better known as a management expert, not an economist, per se. And Drucker, in any event, is clearly alluding to a new set of players charged with safeguarding the nation's prosperity and growth, through enhanced productivity: individual firms.

As has been shown in congressional hearings on Stevenson-Wydler and Bayh-Dole, productivity is clearly a powerful mover of policy; the justification for the bill rests with declining productivity growth rates for the US and a consequent fear of international competitors. This message is reiterated repeatedly throughout the hearings. In later hearings, Roy Vagelos, President of Merck, Sharp and Dohme, opens his statement

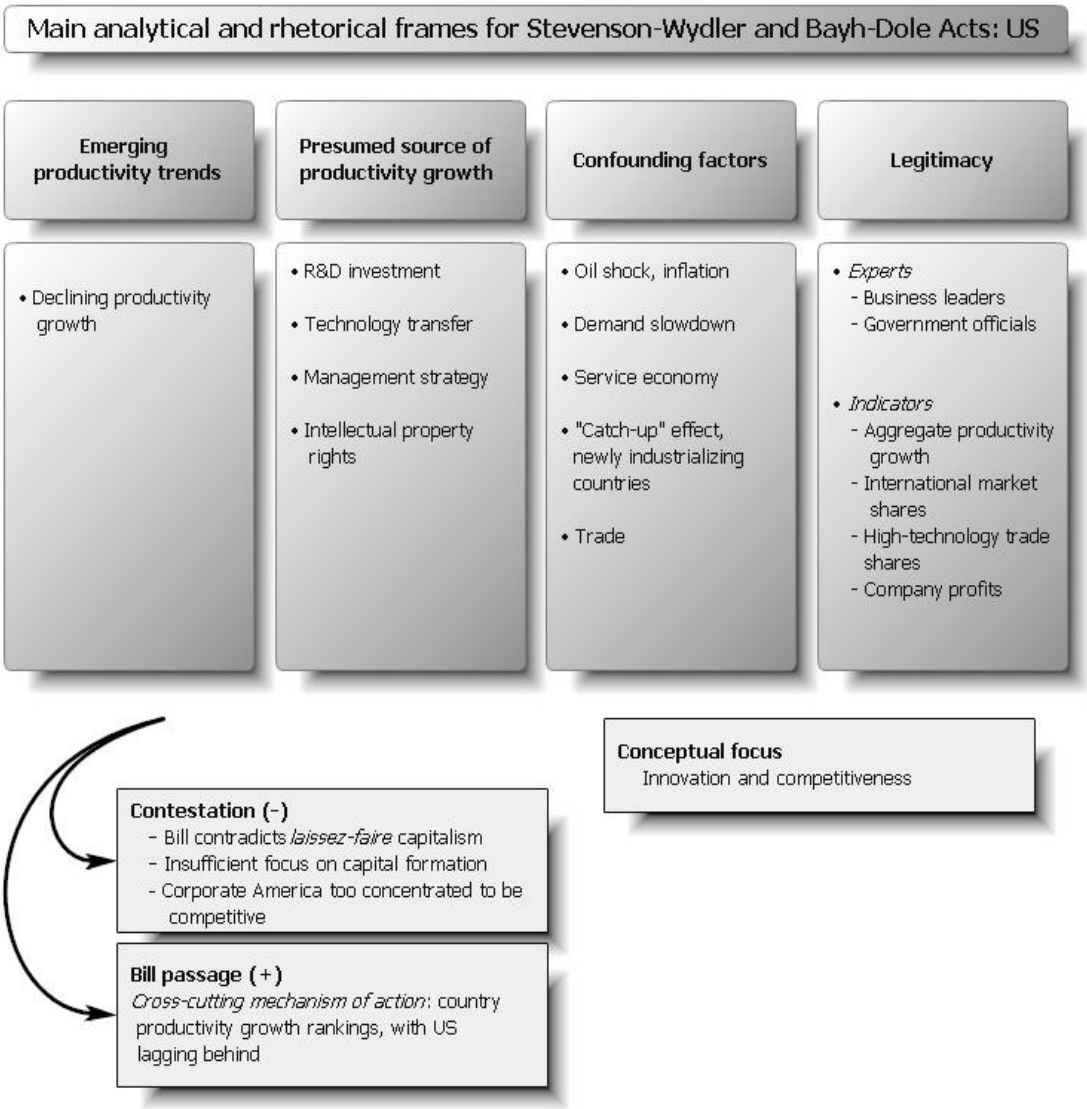
[1403] Drucker argues that returns from liquidated businesses are taxed as profits, for example. Ibid., p. 274
[1404] Ibid., p. 275
[1405] Ibid., p. 276

alluding to declining productivity growth and the consequent need to promote innovation,[1406] and Senator Bayh does the same in his first remarks before the bill goes to vote, "Mr. President, there has been no more troubling issue before this Congress than the disturbing slump in American innovation and productivity."[1407] This message is repeated frequently and resonates loudly across the parties – contestation is extremely weak. Among the experts called, only one offers a clear "rebuttal" to the arguments being delivered in support of the bill. Admiral H.G. Rickover, Deputy Commander for Nuclear Propulsion, US Navy, delivers testimony, acknowledging that his views receive short shrift. Essentially, the admiral's argument comes down to one that derides patent lawyers and the way in which they complicate the system. Rickover's reference is 1624 English law, granting monopoly rights to inventors.[1408]

The more credible contestation was that delivered by William Bittle of the International Association of Machinists and Aerospace Workers during the Stevenson-Wydler debates.[1409] Bittle charges that corporate America has become too concentrated to be moved by domestic competitive pressures, an argument that is deserves consideration, but does not block passage of Stevenson-Wydler. For Bayh-Dole, concerns about antitrust laws, as articulated by Drucker, also do not block bill passage. Ky P. Ewing, Deputy Assistant Attorney General, Antitrust Division, from the US Department of Justice, is careful to spell out provisions of Bayh-Dole that will prevent the act from exerting anti-competitive effects of exclusive patent rights. In particular, Ewing reminds congress that the government maintains "march-in" rights to end exclusivity when abuses are apparent.[1410] The issues of domestic competition and monopolist pricing strategies were thereby skirted, or, at least, were considered covered by the legislation. Figure 10.1 outlines the major elements of the productivity policy discourse during the 1980s and 1990s and its relationship to the passage of innovation legislation in the United States.

[1406] United States (1981), Congress, *Industrial Innovation and Patent and Copyright Law Amendments,* Hearings, April 3, 15, 17, 22, 24, May 8, and June 9, 1980, 96th Congress, First session, Washington DC: US Government Printing Press.
[1407] United States, Congress (1980), *Congressional Record -- Senate,* 96th Congress, Volume 126 (November 20, 1980), Washington DC: US Government Printing Office, p. S-30364
[1408] United States (1979), Congress, *Patent Policy, Part I,* pp. 382-383
[1409] These arguments are outlined earlier in the chapter.
[1410] United States (1981), pp. 18-19.

Figure 10.1



Effects of the legislation, institutional empowerment and spread of the discourse

That both bills became enacted as a direct response to declining productivity growth in the US show, again, the force of productivity measures as indicators of national wellbeing and future health – such in and of itself provide evidence for the discourse as an active and neutralizing organizer of economic activity. What did the two pieces of legislation do? This question, in fact, can be answered at several levels. The first level involves raw numbers. As indicated earlier in this chapter, the US began to develop new indicators in an

attempt to measure innovation and high technology.[1411] These indicators suffered from some level of ambiguity; high-technology industries were considered to be those, whose "technology intensity," defined as R&D expenditures divided by production, were above average.[1412] These statistics evolved to product groups, and then were subdivided into categories of low, medium and high technology, based on the raw definition of technology intensity.[1413]

Although the statistics evolved, it is thus important to read them with a good measure of reserve. Nevertheless, these indicators became intensely linked to competitiveness.[1414] It has been shown in this chapter that congress was fixated on the need to promote innovation, and much attention was directed towards the so-called "high-technology" industries, as they were associated with high growth rates. As clarion calls for action were based on declining productivity growth during the late 1970s and early 1980s, the same alerts were issued for trade; the US had documented its first trade deficit in 1971 since nearly 100 years, and trade in high-technology industries had generated a $2.6 billion deficit in 1986[1415] – six years following passage of both Stevenson-Wydler and Bayh-Dole.

If the intent of both acts was to promote innovation and competitiveness, through "high-technology," the success of the legislation can be inferred by viewing the raw numbers about high-technology exports, for example. Data produced by NSF[1416] show that the United States high-tech exports accelerated sharply from 1981-1982 to 1998, and this relative to other countries under study, including Japan, China, the UK, Germany France, Italy and South Korea. In 1998, the United States is said to claim that largest share of world high-technology exports, at 20 percent, followed by Japan with 10 percent and Germany, 7

[1411] The point is also discussed in chapter 8.
[1412] "Production" was proxied as either sales, value-added, or turnover. Godin (2004), pp. 1217-1218
[1413] Problems of aggregation, as in productivity numbers, plagued these statistics too: "All products from high-technology industries were qualified as high-tech even if they were not, simply because the industries that produced them were classified as high-tech [moreover] … An industry was thus reputed to be high-technology intensive if it had high levels of R&D, even if it did not actually produce or use much in the way of high-technology products and processes." Ibid., p. 1224
[1414] Competitiveness was largely equated with trade measures, or whether a country's exports exceeded import, for example. Ibid., p. 1219
[1415] Ibid., p. 1222
[1416] The NSF is considered the "official" recorder of R&D statistics. Ibid., p. 1219

percent.[1417] The United States had also been leading during 1980 at roughly 55 billion (1997) dollars, while the next highest was Japan at approximately 25 billion (1997) dollars – the spread, then, is not proportionately different from 1980 to 1998. By 2006, China just surpassed the United States' lead in its world share of high-tech exports, with a 16.9 percent share, compared with the documented share for the United States at 16.8 percent.[1418] Note that China is not the focus of concern either in the US congressional or French parliamentary debates – the scare is Japan. At the end of the day, the push for a greater share of exports going to high-tech sectors did not play out in the United States; high technology exports as a percentage of all manufactured exports in the US shows a downtrend: according to World Bank estimates, that share was 33% in 1989 and had declined to 23% by 2009.[1419]

Are these figures material to the productivity discourse? They are. First, they show, in the name of productivity growth, focus is trained on a new indicator: high-technology exports (for one).[1420] If the indicators are everywhere in evidence, they are "in business" as benchmarks against which to make decisions or gauge performance, whether at a national or firm level. Second, the lineup, given the measurement ambiguities and decisions made in order to order devise different levels of technology intensity, illustrates the conundrum of countries gauging their performances, one against the other. If the numbers are meaningful, then China's rise happened unpredictably, and – apart from this new competitor – the US and France appear to be holding their relative places, before innovation legislation and national planning took off in the early 1980s. Inaugurating a national program directed towards innovation does not foretell future ranking, but it shows that they are participating in the race. In fact, the NSF data on high-tech exports exhibit a break for the US around 1982, when they sharply decline; the numbers begin to climb, thereafter, but Japan's then high-tech exports accelerate rapidly at this point – in 1984, the two countries

[1417] United States, (2002), National Science Foundation, *Science and Engineering Indicators,* p. O-9
[1418] European Commission (2009), Eurostat, *Statistics in Focus.* See: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-09-025/EN/KS-SF-09-025-EN.PDF. The EU claims a 15.% share, with France falling behind Germany and the UK.
[1419] http://databank.worldbank.org/ddp/home.do?Step=2&id=4&hActiveDimensionId=WDI_Series
[1420] The high-technology category includes "electronics-telecommunications," representing the largest share, followed by "computers-office machines." European Commission (2009), Eurostat.

are on par with one another, after which point the spread takes effect.[1421] From these data, it can be inferred that some activity altered course for the United States, following the passage of Stevenson-Wydler.

Data on patents granted to universities reveal compelling effects of the Bayh-Dole legislation. Between 1979 and 1984, for example, the number of US university-issued patents more than doubled, an outcome repeated from 1984 to 1989; during the 1990s, these numbers more than doubled again.[1422] The number of US patents granted, generally, in fact followed an upward, but less steady trend over time. NSF data show that the number climbed from roughly 70,000 in 1986 to 160,000 in 1999, with the greatest level of acceleration appearing to occur from 1997 to 1998; form 1991 to 1997, the trend upward is quite flat.[1423] National R&D expenditures by source of funding – industry and federal show that: in 1980, federal funding equals industry funding, after which point industry funding continues to increase, while federal funding maintains its declining trend.[1424] Such is difficult to ascribe to Bayh-Dole Act, or the Stevenson-Wydler Act in any way, other than speculative. What can be argued is simply that R&D expenditures (apparently) are increasingly becoming privatized and that the discourse on applied science and the need to render innovation *useful in order to enhance productivity growth* and secure national prosperity appears to correspond with the trends documented by the NSF.

Nevertheless, it should be kept in mind that there are different ways to measure R&D intensity – one indicator used in competitiveness comparisons. In an article presented for the R&D, Education and Productivity Conference in Honor of Zvi Griliches,[1425] it is shown that indicators for research intensity – or R&D expenditures divided by gross output – differ when based on purchasing power parities (PPP) for

[1421] United States (2002), National Science Foundation, p. O-9
[1422] Richard R. Nelson (2001), "Observations on the post-Bayh-Dole rise of patenting at American Universities, *Journal of Technology Transfer,* 26, p. 13
[1423] United States (2002), National Science Foundation, p. O-10
[1424] Ibid., p. O-11
[1425] Sean M. Dougherty, Robert Inklaar, Robert H. McGuckin, and Bart Van Ark (August 25, 2003), "International comparison of R&D expenditures: does an R&D PPP make a difference?" See: http://www.nber.org/CRIW/papers/dougherty.pdf. The research for this paper was funded by an NSF grant. Related work was presented at an NBER workshop in Cambridge, MA. It is interesting to note how influential Griliches' name continued to be as the rhetoric shifts from "productivity" to research competitiveness, and the extent to which NBER remains central to debates.

specific R&D input prices, rather than the conventional GDP PPPs.[1426] In these "queried" and adjusted cross-country comparisons, it is shown that Japan is the only country with a positive change in R&D intensity from 1987 to 1997, at .41; the UK posts a slight increase at .02, and declines are noted for France (-.12), Germany (-.63), the Netherlands (-.037) and the United States (-.53).[1427] Here again, the plethora of newly emerging indicators makes it difficult to draw any policy conclusions. Was Stevenson-Wydler successful? It is hard to gauge the success, given the fact that the outcome, formerly productivity, is now "competitiveness," with any one of many indicators to be used as a proxy for this concept, or as variables presumed to achieve the outcome of competitiveness. If competitiveness means the number of high-tech exports, then, in 1998, according to NSF data, the United States is the clear leader. If competitiveness means world share of high-tech exports, then according to the same data, the United States continued to be the leader in 1998, but was eclipsed by China in 2006.[1428]

As such, it is difficult to know how to interpret the data found on R&D intensity, or the implications for outcome – just as it has always been for any of the number of ways productivity data have been similarly compared – the use of hedonic indices provides one glaring example of problematic comparisons. The point of interest in these measures and trends is simply to show the extent to which focus shifts with one twist in the deployment of rhetoric, from "productivity" to "competitiveness." Legislation, as argued in this chapter, helped make this happen by creating technology centers and providing new incentives for research and development activities. Declining productivity growth rates helped promote this new, or morphing, "pattern of activity" by signaling a need to address imminent ruin.

As with the productivity (proper) discourse that developed during the early postwar years, the transfiguring discourse spread rapidly across the Atlantic during the 1980s and 1990s. It is little surprise that France's ninth modernization plan bears much in common with the "high-technology" focus of Stevenson-Wydler. Perhaps more interesting is the fact that many countries adopted their own versions of Bayh-Dole following

[1426] Ibid., p. 1
[1427] Ibid., p. 43
[1428] See, for example: http://www.nsf.gov/statistics/seind10/c0/c0s11.htm

its passage in the United States. France is among those countries, and it passed its version of the legislation in 1999.[1429] Such is the power of this discourse to create organizing effects beyond the borders of its origin.

The two pieces of legislation analyzed clearly demonstrate the power of rhetoric and ideas to *empower institutions.* Again, parallels can be drawn with what occurred during the postwar years and the development of institutions relating to the then-discourse on productivity. For example, the role played by the BLS, both in terms of providing expert testimony for congressional hearings, as well as the key statistics on productivity – not to mention its influence on the development of statistics in France – can now be seen to be played by the NSF. From the content of Stevenson-Wydler, as well as that of Bayh-Dole, it is clear that NSF staff are invited to hearings, and the institution is charged with providing statistics for key "science" indicators, R&D expenditures, as well as patent activity and more. NSF, of course, also played the key federal role in awarding grants for research.[1430] Hence, the idea of competitiveness empowered institutions, whose aim was to promote science and innovation, which in turn helped empower the idea of competitiveness, productivity and innovation.

As new institutions are created – US Commission on Industrial Competitiveness (1983), the Council on Competitiveness (1986), the Critical Technologies Institute (1991) and The Competitiveness Policy Council (1992),[1431] to name a few – old ones are disempowered. President Nixon, in 1970, created the National Commission on Productivity, whose name was changed to the National Center for Productivity and Quality of Working Life in 1975 – only to be terminated in 1978. At this time the National Productivity Council was formed (and presumably went).[1432] The Competitiveness Policy Council, created in 1988 as an advisory board to the President and Congress, was denied funding in 1997, a move that was justified on the grounds that "duplicative" (private) organizations, such as the Council on Competitiveness, could well

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[1429] The law is called, "*loi no. 99-587 sur l'Innovation et la Recherche,"* which can be found in the *Journal Officiel, no. 160,* July 13, 1999. See: http://admi.net/jo/19990713/MENX9800171L.html
[1430] See, for example: http://www.nsf.gov/pubs/policydocs/papp/aag_6.jsp
[1431] In 1998, the Critical Technologies Institute was renamed the Science and Technology Policy Institute. Godin (2004), p. 1222.
[1432] Geert Bouckaert (Autumn 1990), "The history of the productivity movement," *Public Productivity and Management Review,* 14:1, pp. 60-61. No listing can be found on the web for the US National Productivity Council, as of June 2011 – curiously, less developed countries do have such a listing, including India and Barbados.

assume its role.[1433] A similar process was evident in France. It bears recalling that the word "productivity" was dropped from the French modernization plans, and the word virtually disappears in the eighth and ninth modernization plans. Following the end of the war, the widespread influence of American-style productivity and the institutional structures that sprang into existence, including productivity centers and productivity missions carried out under the auspices of the Marshall Plan was limited to a particular point in time.[1434]

The US innovation legislation generated many after effects, too numerous to itemize. But, technology transfer agreements, such as CRADAs (Cooperative Research and Development Agreement) have helped to keep the aims of these laws working and evolving over time. CRADAs, in fact, were created by the Stevenson-Wydler Act (amended by the Federal Technology Transfer Act of 1986) and secure innovation rights, as well as incentives to engage in research.[1435] The fact that the original legislation had been amended also supports the idea that legislation, once on the books, is a kind of institutional empowerment that facilitates further legislative and organizing activity as new social needs and interests develop; it is another mechanism through which the discourse is reproduced or aided in its transformation.

The *Annual Report of the President on Competitiveness* and other annual reports that came and went represent another conduit through which the discourse is maintained. Similar to with the *Economic Report of the President*, issued by the CEA, these reports help spread the discourse to policymakers and political elites – they contain recommendations, only, but they leave a paper trail of the discourse and provide the rhetorical reinforcement – reproduction – needed to aid policy formulation and passage.

These reports did not just sit on shelves; they provided grist for public debate. For example, *The President's Commission on Industrial Competitiveness*, delivered in 1985 during the Reagan

[1433] United States (1997), Congress, *House Report 104-676,* Departments of Commerce, Justice, and State, The Judiciary, and Related Agencies Appropriations Bill, Fiscal year 1997, 104th Congress, Second session, p. 6. See: http://www.gpo.gov/fdsys/pkg/CRPT-104hrpt676/pdf/CRPT-104hrpt676.pdf
[1434] Scholars have demarcated the peak of influence to have occurred before 1945-1955. See Luc Boltanski and Alexandra Russell (May 1983), "Visions of American management in post-war France," *Theory and Society,* 12:3, pp. 375-403.
[1435] See: http://www.usgs.gov/tech-transfer/what-crada.html

administration, elaborated themes that had been sounding in the halls of congress since the late 1970s and was debated in congressional hearings.[1436] Senator Pete Wilson[1437] explains, "It is important to understand that our present system has made us a country with the lowest rate of savings among our industrialized economic partners and, not coincidentally, has placed us among those with the lowest rate of improvement in productivity."[1438] For this Republican, the tax system has impaired the country's competitiveness, by privileging consumption over saving; hence the negative impact on productivity growth. Savings can lead to investment in technologies, which then drive the productivity growth engine – this portion of the theme is by now a given, across party lines. Still, it is curious that "savings" never dominated the productivity discourse, in the way that material products, did.

John A. Young, President and Chief Executive Officer of Hewlett-Packard was appointed chairman of the President's commission and delivered testimony during these hearings. Young first outlines five indicators revealing the cause for alarm behind the declining competitiveness of the US: the increasing trade deficit; lost world market shares in high-technology sectors – the "… driving force behind the productivity gains that make our high wages possible"; decreasing rates of return on manufacturing assets; inferior productivity growth rate compared with major trading partners; and stagnating wages during the past 10 years in the business sector.[1439] Stagnating wages are considered to be a threat to competitiveness, according to Young, because the definition of competitiveness adopted by the commission is "… our ability to succeed in world markets while maintaining our standard of living."[1440] The mixing of concepts – here, trade and productivity – is something also to have been the rule, rather than the exception, and it is curious how some of these indicators are at cross purposes; high wages are seen as a hindrance to gaining world market shares, though stagnant wages appear to be compromising the US standard of living.

[1436] United States (1985), Congress, *Review of the Findings of the President's Commission on Industrial Competitiveness,* Hearing, March 29, 1985, 99th Congress, First session, Washington DC: US Government Printing Office.
[1437] Pete Wilson, a Republican, served California as senator from 1983-1992.
[1438] Ibid., p. 28
[1439] Ibid., pp. 29-30
[1440] Ibid.,, p. 30

Other problematic issues revealed in such hearings include the idea that technology markets may well drive productivity growth, but success can be confounded by countries such as Japan, which can apply the technology more cheaply. This is, effectively, the point raised by the Finance Committee Chairman Bob Packwood[1441] when he asks Young, "Even with world class science, and assuming we had the engineering capacity to reasonably quickly turn that into productive capacity, how would that give us a much greater advantage over Japan or elsewhere?"[1442] Young's response is that the US can't implement its technologies as quickly, which is why more must be done to achieve higher productivity growth in the face of high wages. The argument, of course, is circular: high wages prevent the US from being competitive, but if wages are linked with productivity, higher productivity will not solve the problem – wages will increase higher still, according to the assumptions grounding the argument. What's more: the argument skirts the issue of what investments are to lead to higher gains in productivity. If it is knowledge, it can spread freely; if its applied technology, then the hope is that the US applies it more quickly than its competitors, but if competitors later adopt the technology and produce at lower cost, the US is, then again, uncompetitive. The remark, all told, rather clearly shows the problem of conflating two concepts – competitiveness and productivity – and everything in between.

While not legislative action, per se, these hearings – part of the institutionalized discourse as produced in official documents – demonstrate, again, the central legitimizing role played by the concept of productivity growth and the power it has to neutralize divisiveness and move policy. These hearings and the documents that underlie them also amply illustrate how the discourse has morphed and has included new voices, or authorities, on the topic; the focus is trained on firms and high technology, not industry and national aggregates; the arguments revolve around trade, not production per se; managers and business leaders dominate the discussions and debates, a place once held by academic economists; the Soviet Union no longer, as viscerally, threatens the core of the American nation, but Japan does. In short, the 1985 report reflects a great deal about the way in which the discourse has shifted, and the policy shift corresponds quite neatly with that outlined in the scientific discourse.

[1441] Robert Packwood, a Republican, was a senator for Oregon from 1969-1996.
[1442] Ibid., p. 30

Contestation over longer-term social and economic effects of the legislation in scholarship

Unlike the public debates surrounding Taft-Hartley and the European Recovery Act, for example, neither the Stevenson-Wydler Act nor the Bayh-Dole Act elicited major contestation from the floor. Disagreement occurred over the details of promoting investment and spread of technology, as well as the role of the state. But the declining rates of productivity – everyone's rallying cry – trumps these differences and moves the policy relatively quickly and seamlessly forward. Absent are protests claiming that either of these acts will lead to socialism or communism – labor has hardly a voice in these debates, unlike those for Taft-Hartley. Contestation, in a sense, comes later with these acts in terms of their longer-term effects. That is, beyond bill passage itself and the new focus on R&D/innovation indicators, the fear of declining productivity growth as a causal mechanism can trace to more specific and later-developing effects on the economy.

These longer-term and more specific effects are contested by some and embraced by others; no attempt is here made to assess the value of these effects, only that they have occurred. It is important to draw attention to research on these effects, because it helps illuminate how far-reaching the changes can be inferred from the passage of one legislative bill. For example, the shift in the way research is organized – a fairly broadly defined outcome – has been analyzed by scholars Slaughter and Rhoades, who claim that the end of the Cold War marked a shift in the way R&D resources were allocated, towards fields with "…profit-making potential of intellectual property, most dramatically exemplified by biotechnology…."[1443] The shift, according to Slaughter and Rhoades, which lends support to the claim in this chapter, was legitimized by the emerging discourse on competitiveness.[1444] Who were the players? According to Slaughter and

[1443] Sheila Slaughter and Gary Rhoades (summer 1996), pp. 303-304
[1444] Ibid., p. 304. The authors claim that "winning the cold war" no longer had currency to justify spending on high technology, though winning global market shares had. The problem with this explanation is one of timing: the competitiveness discourse began before the end of the Cold War. Still, the authors' overall argument tend to substantiate claims made in this chapter, and their work looking at the effects of the shift on university research life is important to note. The authors also make claims that square with those made by experts (such as Peter Drucker) in the hearings covered, such as the tendency of corporation in the 1970s to diversify and become conglomerates. This outcome, they argue, derives from declines in profits and productivity. Ibid., p. 310

Rhoades, business leaders needed to respond to growing competitive threats and found allies in government and university administrators.[1445]

Much of the shift in terms of research focus is illustrated by the health-care industry, which no longer – according to Slaughter and Rhoades – lobbied congress to "fight against disease," but to join the competitiveness race.[1446] The switch also changed the kinds of markets being pursued by the health-care industry: "As the health care industry moved from nonprofit status to for-profit status, it began to pursue high-technology health care solutions that focused on diagnostics, protocols, pharmaceuticals, and biotechnology to reduce their cost and increase profits."[1447] Slaughter and Rhoades also describe the increasing institutionalization of the competitiveness discourse, such as the formation of the Business-Higher Education Forum, linking CEOs with university presidents.[1448]Was biotechnology/pharmaceuticals to provide the highest productivity growth rates of all new technologies at the time, or was this industry the fastest growing in sales?[1449]

More important to the claims being made in dissertation is that Slaughter and Rhoades argue that these trends were reinforced by legislation passed, Stevenson-Wydler and Bayh-Dole, included.[1450] The former blurred lines between public and private sectors, while the latter is noted to have "contractualized" relations between university faculty and business management.[1451] More specifically, the overall effects of the claimed shift included a greater share of university funding going to applied research, compared with basic research; funding also went to a greater share of team work, compared with individual researchers from the

[1445] Ibid., p. 306
[1446] Ibid., p. 304
[1447] Ibid., p. 313
[1448] Ibid., p. 315. The organization still exists. See : http://www.bhef.com/
[1449] This depends on how "productivity" is defined. In terms of drug sales, pharmaceuticals, as a percentage of healthcare costs in the US declined steadily from 1960 to 1980, after which point, the percentage accelerates rapidly, back to the 1960 level (in 2000) – this according to data sourced to CMS (The Centers for Medicare and Medicaid Services) in an Arthur D. Little executive summary report: http://www.ftc.gov/os/comments/intelpropertycomments/littlearthurd2.pdf . In this report, the effects of R&D investment in pharmaceutical on productivity are inconclusive. See page 27, for example.
[1450] Ibid., p. 317
[1451] Ibid., p. 318

early 1980s to the early 1990s.[1452] Other effects include new university rankings by patents and R&D "performance criteria," as well as altered remuneration schedules of professors, depending on their field of specialization: highest increases from 1983-1993 went to law, engineering, health science, business and management, and computers and information science.[1453] The categories make intuitive sense: in an age of disputes over intellectual property rights, we might infer that lawyers would experience an increase in remuneration. And, as the competitiveness discourse focuses increasingly on the productivity of firms, not on national aggregates per se, it is equally reasonable to expect that management professors, too, would become more highly valued and accordingly compensated. Engineering and computer science, as well as health care – are all fields that are highly relevant to the competitiveness discourse. While the correlation cannot prove a direct link, it would not require a great stretch of imagination to argue that remuneration and links to the competitiveness discourse are related in something more than a spurious way.

A further correlation that merits study is the steady increase in average university tuition, for both public and private universities. Studies have shown breaks in the data for public institutions of higher learning occurring during the early 1980s, with steady tuition increases at 5.6 percent a year.[1454] From the 1980s to the present time, data show steady increases for both public and private institutions, with some fee acceleration for public 4-year institutions occurring at around the early 2000s.[1455] A decrease in state funding is noted widely in the literature. The issue to explore is whether the decline in state funding and the increasing private fees in some way trace to the technology legislation passed in the early 1980s conferring a more entrepreneurial research role on US universities. Various arguments are offered in the literature, and several studies have attempted to analyze the effects of legislation, including why variation in technology transfer performance is observed across universities.[1456] Slaughter makes the bold claim that legislation, such as Stevenson-Wydler and Bayh-Dole, prepared the ground for "academic capitalism," and that with

[1452] Ibid., pp. 324-325
[1453] Ibid., pp. 328-330. Note that this also lends support to the tentative claim that a shift in CEO remuneration occurred as the productivity discourse increasingly became the province of business leaders, detracting from the central role once played by economists. See p. 158, footnote 574.
[1454] See, for example: http://elsa.berkeley.edu/users/cle/wp/wp66.pdf , p. 12
[1455] See: http://trends.collegeboard.org/downloads/College_Pricing_2010.pdf
[1456] Joshua B. Powers (2003), "Commercializing academic research resource effects on performance of university technology transfer," *The Journal of Higher Education,* 74:1, pp. 26-50. This article explores various effects from university technology transfer.

the legislation, "Universities became organizational exemplars of Reaganomics."[1457] As Slaughter noted, "Paradoxically, many of the departments defined as close to the market graduated relatively few majors, creating systemic productivity problems at the undergraduate level."[1458]

Some studies have posited a more neutral claim that universities for which R&D expenditures are rising exhibit the highest student-teacher ratios, as well as larger tuition increases.[1459] Intuitively, we would expect legislation, such as Bayh-Dole, to influence R&D spending at universities. Again, the question remains whether state and federal aid declined – in a way unrelated to the technology legislation of the early 1980s.[1460] But if we limit the analysis to the simple assumption that such acts did translate into higher R&D expenditures, the real question for the productivity debate is the following: given the expected gains in national productivity with investments in R&D, the fact that university students and their families are coming under increasing financial strain in pursuing higher education must, too, be factored into the overall productivity equation. In other words, if a policy leads to productive R&D spending, but diminishes chances for some students to pursue higher education because of associated costs – with or without a decline in state funding – or lessens education quality because of higher student-teacher ratios, how productive, at the end of the day, is the policy? It has also been noted in the literature that the nature of the university patenting system has lead to bottlenecks in generating research, as more steps in the research process – even those that are needed only to further the research process – now require licensing to proceed. Other cited effects include a more closed research community, with information exchanges now

[1457] Sheila Slaughter (1998), "Federal policy and supply-side institutional resource allocation at public research universities," *The Review of Higher Education,* 21:3, 1998, pp. 209-244. Quote from: http://muse.jhu.edu.proxyau.wrlc.org/journals/review_of_higher_education/v021/21.3slaughter.html, p. 16. Also: "… the sharp increases in university patenting and licensing clearly are associated with the development and maturation of certain new fields of university research, in particular the rise of biotechnology, where research results often seem to promise significant commercial value down the road." Nelson (2001), p. 14
[1458] Slaughter (1998)., p. 2
[1459] Ronald G. Ehrenberg, Michael J. Rizzo, George H. Jakubson (April 2003), "Who bears the growing cost of science at universities?" *NBER Working Paper 9627*, Cambridge, MA: NBER, pp. 1-39 See: http://www.nber.org/papers/w9627
[1460] It has been conjectured that "… universities are paying significantly more to run their patenting and licensing offices than they are bringing in license revenue." Nelson (2001), p. 17

guarded more closely – such is one possible effect of shifting research from the public to the private realm.[1461]

Such examples illustrate what can be the unintended consequences of imputing one factor – here, applied technology – as the key to productivity growth, when policies have the potential to generate a multitude of after-effects, both direct and indirect, on "productivity" in a complex economy. Complicating after-effects do not necessarily make the policy wrong. They make the name in which the policy was framed a misnomer, which implies the outcome by which success is to be gauged is misleading.

Policy effects not only influence general patterns, such as levels of R&D spending, university patent outcomes and, even, the way in which university curricula shifts – they can also be traced to particular innovations. The story of the anti-retroviral agent, *Zerit,* a nucleoside analog (d4T)[1462] that inhibits the HIV virus from replicating,[1463] demonstrates the way in which moves in the name of an overall national outcome, such as productivity growth, tend to expand and encroach upon policy areas as seemingly far away as foreign relations.

These effects are revealed in a recent interview conducted with drug co-discoverer, William Prusoff, a professor at Yale. Specifically, Prusoff claims that the cost of drug development has rendered the institution sensitive to profit making – through patenting – but that the role sits uncomfortably with the institution. For example, the licensing of *Zerit* to Bristol Myers Squibb (BMS) and its commercialization in 1994 left both inventor and Yale without any control over the process;[1464] the drug was priced too high, for example, to treat HIV-infected individuals in poor African countries, for example. Legal scholar Michaelson has indicated that BMS research costs figure at roughly $300 million, with revenues from sales of the drug by the end of 2000 estimated at more than $2.3 billion.[1465] Did the company reap windfall profits? If so, why

[1461] Ibid., pp. 17-19
[1462] The chemical name for *Zerit* is stavudine.
[1463] Lucy Wang (Winter 2004), "Drug design: the battle against nature," *Yale Scientific Magazine.* See: http://ysm.research.yale.edu//temp/YSM-Article320.pdf , p. 23
[1464] Ibid., p. 23
[1465] Michaelson (2002)

were the march-in rights not invoked by the government,[1466] given the fact that taxpayer moneys were involved? The pricing issue launched numerous measures and debates surrounding the development of this drug at many levels of the government, business, and within Yale itself.[1467] Such does not in any way dismiss the achievement in drug development, nor the way in which Bayh-Dole helped bring this outcome to fruition. The story simply illustrates the far-ranging powers of one alarmist call: declining productivity growth rates.

The declining rates in productivity, reiterated nearly *ad nauseum* in congressional hearings on Stevenson-Wydler and Bayh-Dole, created a call for action that resonated across parties and interest groups. Contestation – or, more properly, sporadic challenges – to some of the after-effects of the legislation are apparent in the scholarly literature. But such contestation has never been sufficiently strong to question the notion of productivity itself. What seems clear is that the push for productivity, competitiveness, and innovation – however combined or conflated – has re-organized important aspects of economic and social life, indeed, academic life. What we do today has become accepted as "common sense."[1468] Without understanding the historical trajectory, it is near impossible to fathom that different outcomes would be possible had society conferred other social meanings to the word "productivity."

At the end of the day, the productivity discourse during the postwar years and beyond led a call to action in both France and the United States. By and large, the call to action was negotiated through very similar conceptual frameworks, summarized as follows in figure 10.2.

[1466] The case for invoking march-in rights is made by David Halprin, former Special Assistant for National Security Affairs speechwriter to President Clinton,(1998-2000).
See: http://www.ott.nih.gov/policy/meeting/David-Halperin-Attorney-Counselor.pdf
[1467] Ibid., pp. 23-37
[1468] The term refers to that used by Antonio Gramsci. See chapter 3 for a discussion of this concept.

Figure 10.2

General conceptual framework, policy debates: France and the US

	Early postwar years	IT revolution
Rhetorical deployment	Productivity	Productivity Competitiveness Innovation
Policy focus: economic level	National and industry aggregates	Industry and firms
Experts called to testify	Economists*	Business leaders and economists*
Statistical measures cited in testimonies	Productivity	Productivity Market shares R&D investment

Summary points and relevance for "truth claims"

1. The call to stave off decline and spread of ideas about productivity to different social "locations," namely in policy documents and new institutional configurations. As during the postwar years, as well as similar to law-making initiatives in France during the early 1980s, productivity provides a rallying cry to action during the early 1980s in the United States. During hearings covering the sliding level of productivity growth in the United States, the call for action is clear; productivity growth decline will deter the economy and impinge upon the US standard of living.

As will be claimed in the section below, the discourse is transforming at this time – the discourse on productivity is often conflated with competitiveness. The source of productivity and competitiveness is determined to be high technology, however defined. R&D expenditures become one of the main proxies for the source of productivity growth, and this development is well documented by the pervasive spread of the new discourse, from empowered mandates at the NSF to generate new technology- and innovation-based indicators, as well as the generation of competitiveness commissions and reports that help lock in place the conflation between productivity and competitiveness. As noted in the previous chapter, these developments parallel those in France.

2. Evidence of a shift and implications. Does a conflation between productivity and competitiveness represent a true break in the discourse? It was argued as being so for France; the same is true for the United States. As one example, during the congressional debates on declining US productivity congressman Lundine links low productivity growth to a weakened dollar by making American products less competitive, upsetting the balance of trade. It could be argued that the congressman is reiterated a past

message: produce more cheaply, thereby rendering American products more competitive in a least-cost sense. This is not the message. The message involves the development of new, knowledge-based products to satisfy – the commercialization of knowledge – and investment in education and new skills. The congressman concedes that the magic driver of productivity growth is not definitively now, but that the US must bolster its position on the global market. If other countries are responding to the challenge by expanding R&D budgets, should the US not do the same?

It is not only the means to the end that has shifted. The language, as well as the experts called to testify, has also shifted. In congressional debates on the Stevenson-Wydler bill, the language is business-oriented, with terms, such as "applied research" and "entrepreneurship" serving to bolster arguments. Experts serving government technology sectors, as well as leaders from firms, such as Monsanto and Xerox, play critical roles in these debates. Academic economists, too, deliver testimony, but it is striking to discern the level of contestation on the part of these experts regarding the remedies under consideration. Their transforming role, from advocate to challenger, is noteworthy. MIT representatives declare the role of the university, as knowledge producers, must change. Academics assert that universities are "… causal in the development of new companies."[1469] The focus is trained on products, not processes, although the importance of technology and innovation for both are mentioned in debates.

3. The rhetoric of productivity moves policy forward. The sources of declining productivity growth differ; consensus about the exact role of the state, institutional configuration – even inflation – is lacking, though each of these topics surface in debates. "High technology" and "innovation" resonate across party lines; the rhetoric is alluring and innocuous. And, it may be correct in terms of productive policy or it may be wrong; but, it works. The allure of innovation, coupled with the alarmist calls for action, together cause legislation to move forward. On a subtler note, the Stevenson-Wydler and Bayh-Dole bills differed in their orientation: one was concentrating the role of the government, while the latter devolved powers to individual firms and universities. The rhetoric of innovation and rescue is what the two bills shared. It can

[1469] This refers to the comment made by Dwight Baumann. See p. 349.

be inferred that rhetoric is causal from the fact that the conduits of innovation and productivity growth are ambiguous, but move policy forward, nevertheless. Senator Dole links patent rights to productivity, thusly legitimizing the core of the bill under debate.

The work of Slaughter and Rhoades, in some sense, challenges the argument being made in the dissertation that ideas, and not power interests, explain the lion's share of economic organization generally and legislative initiatives, more particularly. Lobbyists used their power to twist the arms of legislators, who then collapsed and granted favors. This argument does not explain how the discourse shifted and what provided the entrée for business lobbyists to influence legislation, in the first place. And, does it matter? People seize opportunities; but, without the shift in discourse, the opportunities would have never presented in the first place. As Wendt would argue, you need first an idea about what your interests are, before interests can explain outcome.[1470]

4. Contestation and implications for the rhetoric of productivity. It is interesting to note that contestation in these debates is dominated by economists, who played a large role in the conceptualization of productivity during the earlier years. Denison, the economist, who challenged the work of Griliches and Jorgenson,[1471] is noted not to ascribe productivity growth to R&D expenditures. Dale Jorgenson, whose work is amply covered in this dissertation, strongly contested the Stevenson-Wydler bill under consideration and linked productivity growth with capital formation, not innovation, per se. Jorgenson also claims Japan's competitiveness in automobiles to be linked with lower wages, not higher productivity. These declarations make clear the confusion that arises when productivity and competitiveness are conflated, and the judgment comes from a high-profile academic economists.[1472] Contestation, in this sense, not only exposes the difference in opinions among experts; contestation also lends credibility to the claim being made that the discourse shifted from the earlier postwar years to the 1980-1990s. Academic economists cede some of their territory to experts in business management and business leaders.

[1470] This idea is explored in chapter 3.
[1471] Griliches and Jorgenson
[1472] Such is apparent, for example, in Jorgenson's claim that anti-dumping measures, in order to secure competitiveness, retard investment in new technologies to generate industries that can compete on their own merit.

As in France, the role of the state is contested in these debates. Senator Stevenson draws attention to Japan's success and implications for government involvement, noting that government help is particularly warranted in times of crises. The fact that attention is focused on Japan lends some support to the claim that countries attempt to emulate "best practices." What becomes clear in these debates is that congressmen cannot achieve a consensus on the role of the state; only innovation and productivity cut across ideological lines. Congressmen, in fact, expressed incongruous ideas regarding the role of the state; at the end of the day, legislation implies state involvement at some level.

Other points of contestation include Bittle's charge that US industry is too concentrated, and hence protected, to encourage inventiveness. As noted in debates taking place during the early postwar years, the argument that US industry is too concentrated does not gain widespread traction among legislators. UCLA's Rosenstein's challenge that the US need to produce ideas, only apply them, represents a call to reconfigure institutions to facilitate the latter. This position, similarly, does not resonate broadly. To reconfigure institutions, ideas about interests must cut across social groups. In this case, the neutral allure of innovation does; applying the ideas of others does not.

Chapter 11: The popular discourse in the United States: 1950 and 1990

Representation of productivity in the popular discourse: the United States during the 1950s

As a pattern of activity,[1473] discourse should be discernable in a myriad number of sources and contexts. It has been shown how the concept of productivity became established in the scientific literature and how the authors of this literature assumed their role as the legitimizing voice of authority: NBER authors, for example, were called to congressional hearings to offer expert testimony, as were agency officials from the BLS. If the discourse, however, is truly "doing productive work" and influencing all social levels – not merely elites – then it would be expected that the discourse would also be discerned in the popular press. In the United States, *Business Week* is a business news magazine that has long formed part of the popular press since its first issue was launched in the late 1920s.[1474] Because of its widespread influence, the weekly serves as a justifiable basis on which to gauge the penetration of the productivity discourse into popular media. It should also be remembered that *Business Week* was mentioned during one of the French parliamentary debates analyzed in the previous section, indicating that its influence crossed borders.[1475] Theory anticipates that the discourse would be represented in articles directly covering the topic of productivity, as well as in its coverage of specific legislation and institutional powers that are linked to the discourse. Advertisements, too, should reflect the conceptualizations of productivity at that time. Finding this representation – at each of these levels – would provide additive evidence for the potency of discourse as an economic organizer, as well as the extent to which the discourse has spread from scientific and policy circles to the population at large.[1476] Last, and perhaps most importantly, this study claims that discourse

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[1473] See page chapter 3 under the section "Method" for a discussion of this definition.
[1474] For an idea of Business Week's early and later influence see, as one example, Christopher D. McKenna, "The World's Newest Profession: management consulting in the twentieth century," http://es.oxfordjournals.org/content/2/4/673.full.pdf
[1475] See p. 224.
[1476] The popular discourse was difficult to track for France as a parallel to that in the US, because weekly business magazines appeared later in the century. *Les Echos,* a financial daily was launched early in the century. A weekly, *l'Express*, covered many topics and was not, during the 1950s, specialized in business topics, per se. As a future research goal, a content analysis, for example of *Les Echos* would be interesting to compare with what is here detailed for *Business Week*. For more information concerning the influence of *Groupe les Echos*, see http://www.referenceforbusiness.com/history2/10/Groupe-Les-Echos.html.

shifts over times as the social context evolves – the changing social context leading to new conceptualizations of productivity, as claimed in previous chapters, should be reflected in the popular press – whether or not "productivity" as a concept is specifically covered (or the legislative and institutional developments affiliated with the discourse). Because policy chapters in this dissertation focused on the early postwar years, as well as the 1980s-1990s, when information technologies, were becoming widely integrated in business processes, issues of *Business Week* analyzed fall within the same two time periods. Using the same reference popular press facilitates comparison over time, helping to provide gauges of shifts in the discourse in a more uniform way compared to marking shifts in legislative debates that cover different bills.

Business Week **during the 1950s: what to expect**

By 1950,[1477] effects of the *Marshall Plan* (administered through the *Economic Cooperation Administration*, ECA), the *Employment Act of 1946* and the *Labor Relations Management Act of 1947* would be expected to materialize in the social context. Were these pieces of legislation *not* mentioned in a business magazine with as wide a readership as *Business Week,* the claim that these acts exerted organizing effects in the economy would, at the very least, be weakened;[1478] the potency of the discourse, in other words, could be questioned. On the contrary, if it can be inferred that these acts did, in fact, influence business decisions as shown by their coverage in the popular financial press, then at least some credit must be attributed to the discourse as an "organizer" of economic activity. In addition, because the claim is being made that institutional powers, such as BLS and NBER, were critical to the spread and reproduction of the productivity discourse, detailing of the extent to which these organizations also figured into the news reported by the popular press helps understand the role they played in more general settings (i.e., not legislative chambers), as well as in the business community at large.

[1477] The choice of year is a *choice:* it reflects the idea that, if the legislation and institutional bodies were organizing and influential, then they would be covered in the popular press *any* year following the passage of the acts.
[1478] The argument made for the Employment Act of 1946 differs: in this case, it was argued that the productivity discourse worked to dilute the bill, thereby putting the breaks on government powers.

A second way to assess the discourse's force is by analyzing articles that cover productivity as a *topic*, as well as the advertisements that use the discourse to help promote products and manufacturing processes. Do these articles and advertisements refer to productivity in ways that parallel, or compare with, the scientific discourse? If yes, the power of discourse to infiltrate mainstream ideas and actions would gain credibility. More specifically, we would expect editorial and advertising effects to center on production processes, production itself and labor – particularly labor-saving machinery during the early postwar years. This discourse should switch to innovation and technology, R&D, and a focus on products, not production processes, per se.

Data collection and overview. A biannual index for *Business Week* provides an overview of articles by subject matter. From each index in 1950, then, a count of articles was made, referring to (1) Marshall Plan (as administered through ECA) (2) Taft-Hartley (3) Employment Act of 1946 (4) BLS and (5) NBER. The counts are considered to be exceedingly conservative, as many articles covering these topics and or institutional bodies are presumed not to have been cross-referenced when they were covered in the context of a larger theme.[1479] Roughly 7,650 articles are listed in total for 1950 – clearly, this number indicates that single articles were subsumed under a myriad of titles, as the number of separate articles for 1950 roughly totals 2,200.[1480] Nevertheless, articles falling under the specific pieces of legislation and institutional bodies noted were documented. Granted, the proportion of articles with designated themes is slight compared with the total number of titles printed. But this fact is not relevant: the aim of the research is to show that policies and institutions that helped spread the discourse actually *made it* in the popular business press and that they were represented in ways that mirrored the scientific and policy discussions.

A second way to gauge the effectiveness of the discourse can be achieved by tracking article titles under the magazine's "Production" and "Labor" sections. Articles that had "productivity" in the title were also

[1479] For example, under the subject heading, "Prices" an article appears, entitled, "BLS index of wholesale prices of industrial prices shows costs of rearming are much higher today than they were 10 years ago," (page 9, July 22 1950); however, this article is *not* listed under the heading, "Bureau of Labor Statistics."
[1480] This figure was arrived at by averaging the number of articles in the first issue of each month, from January to June 1950 and then multiplied by 50 (number of issues for 1950).

included in the analysis. Advertisements that referred *explicitly* to key "productivity" concepts during this time, such as "productivity," "cost-savings," "efficiency," and "speed" were compared to the advertisement total. This count, again, is conservative, because most articles, if not explicitly, implicitly refer to higher productivity as a way to sell products and services. For example, in a February 4, 1950 edition of *Business Week,* an advertisement by Ceco Steel notes that, "Ceco has been advancing the thought that prosperity and security of our nation are tied unremittingly to a four letter word, W-O-R-K," and later in the text demands a "Command Performance from Business – a performance to stop this creeping Socialistic pattern which threatens the freedom of all."[1481] Clearly, both claims implicitly rest on the idea of productivity and how it is linked to larger socio-economic issues. But because the link is not explicit, it was not counted as clearly representing the postwar concepts of productivity. Last, due to the sheer volume of data and the fact that results gleaned from the sample taken were overwhelmingly repetitive,[1482] only the first edition of *Business Week* during January to June of 1950 were analyzed for general editorial and advertisement content. This choice of data collection is also justified within the context of the research aim stated; no attempt to conduct a content analysis is made. The latter is based on epistemological assumptions – statistical laws – that run contrary to claim made for this dissertation that outcomes are reflective of unpredictable, not patterned, changes in the social context.

Business Week Index of Editorial and Advertising Content, 1st half, 1950 (January – June)

In the January to June index, nine entries are listed under *Taft-Hartley.* The titles indicate that the jury is still out regarding its ultimate impact on labor relations. For example, in the June 24, 1950 issue, the title reads, "Three years after: the Taft-Hartley record: not so effective as management hoped, not so bad as labor feared."[1483] Other titles deal with specific issues linked with the Act, such as the imposition of an anti-communist oath. Even at a conservative estimate of 9 entries, the fact that this piece of legislation is

[1481] Page 52
[1482] A pattern of the proportion of advertisements that were assigned for each category remained relatively stable from one issue to the next. For example, under "quality" during the 1990s, the proportion of the total for the first issue of the first six months of 1990 did vary: 49%, 24%, 61%, 59%, 70%, and 81%, for January to June, respectively; however, the category "quality" was always a majority of ads featured, even in the February 5, 1990 issue, where "quality" was the least proportionately represented over all six issues covered. In this study, what is important is the *dominant* discourse, which for this case – as an example – can clearly be attributed to the discourse of "quality" in 100% of the issues analyzed.
[1483] Page 98

covered in 9 articles of the first six months of *Business Week* issues at the very least discloses a solid interest in this legislation on the part of the magazine's readership. On the contrary, no entries are listed under the *Employment Act of 1946* – the diluted act appears to have effectively escaped notice (at least in terms of meriting a title on its own). In this case, it can be inferred that the effort to reconfigure the act to lessen its force is possibly reflected in its lack of coverage – at least for this time period under consideration. The largest number of entries for the legislation covered is that for the *Marshall Plan* under the heading of its administrative body, the Economic Cooperation Administration. Among the 25 entries listed, some titles include:

- Aid to Europe is now taken for granted, both here and abroad
- ECA has set up new division to help Marshall Plan countries sell more to the US
- Machinery shipments to Marshall Plan countries during ECA's first two years came to almost $1 billion
- ECA breathes life into Fiat: Italy's biggest auto builder starts $45 million modernization program[1484]

From these titles, the impact of this particular legislation is apparent. The titles do not convey a concern for productivity as much as the gain in markets on both sides of the Atlantic (apart from Fiat's modernization program). That aid may be taken for granted is what legislators appeared to fear. But the power of the legislation to link the US business community with Europe is evident in these titles. In other words, productivity, as an argument, may have sped policy passage; the policy clearly exerted far-ranging effects. Hence, the discourse was "productive."

Nine entries are listed under the heading, Bureau of Labor Statistics. The titles do not pertain to productivity issues, per se, but the fact that the BLS is covered relatively frequently provides some indication of its institutional reach. Many titles cover indices, such as, "As index falls, peace hopes rise: a 1950 decline in living costs would ease union pressure for wage hikes."[1485] This title also betrays the unfulfilled promise of the productivity discourse by highlighting labor unrest – if wages automatically followed productivity increases, there would presumably be no need to match wage increases with cost-of-living indices; growing productivity is presumed to provide employers the option of paying for increased

[1484] March 4, 1950 (p. 16); April 8, 1950 (p. 112); April 8, 1950 (p. 119); and May 27, 1950, (p. 117), respectively.
[1485] January 21, 1950 (p. 100)

wages through higher output, rather than higher product prices. Other titles include, "BLS this week estimated that machine tool business this year may top 1949 by 20 percent" and "Sickness, accident benefits now appear in about 30 percent of labor-management contracts on file with BLS."[1486] Once again, such titles implicate the BLS as a major source of information on which firms and the government base their decisions. The BLS, of course, publishes national and international figures on labor productivity, as well as multifactor productivity – the spread of this institution in the popular press, then, also helps maintain and reproduce the discourse on productivity, by granting it greater recognition.

Last, under the heading, *NBER,* one article is listed: "Business cycles: a way to spot them: new indicator, a composite of hand-picked economic series, tells when a recession is in the making."[1487] First, the fact that work by NBER is featured at all in *Business Week* is significant: NBER is an exclusive and academically affiliated organization but had gained sufficient legitimacy among the magazine's readership to be covered as an authoritative source of information. The theory of business cycles formed a core area of NBER studies and was seemingly made accessible to a more mainstream readership. This simple development provides a window into the way different institutional elements became influential in other socio-economic settings. In fact, the institution has demonstrated, at least on a content level, quite solid staying power. In an August 13, 1990 issue, an article asking whether or not the economy has sunk into recession is subtitled: "The buck stops here: a recession isn't official until the economists at the National Bureau of Economic Research say so."[1488] Such, at a minimum, suggests that the institution has long provided legitimacy in terms of its economic assessments, generally, which, naturally, would included its papers and positions on productivity measures.

Business Week Index of Editorial and Advertising Content, 2nd half, 1950 (July – December)

For the second half of 1950, three entries are listed under *Taft-Hartley.* The contentiousness and wariness of the act is clear in some of the titles presented: "Labor can't change T-H now: unions' buffeting in

[1486] May 13, 1950 (p. 10) and June 17, 1950 (p. 124), respectively.
[1487] June 10, 1950 (p. 26).
[1488] Page 32

elections last week means law won't be watered down in 82nd Congress" and "T-H cases hit Supreme Court: docket lists first big load of appeals under new labor law."[1489] The act is being watched by industry, is involving the Supreme Court and ongoing congressional sessions three years following its passage. The staying power of its effects and controversies attest to its power as an act; the title here selected illustrates the myriad ways in which a single act can involve multiple levels of the socio-economic context. It is also noteworthy that several titles are listed under the headings, National Production Authority and National Labor Relations Board.

Again, like during the first half of 1950, the Employment Act is not listed as a heading in the index covering July through December. Effectively, the business community is not being *directly* influenced by this Act – concerns about unemployment are clearly present in the mainstream press, and the CEA may help spread concerns through its reports. But, the act does not appear to work at the level of direct business decisions. On the other hand, a counterfactual can be posed: had the act not been diluted, what would the effects have been? In some sense, a "non-act" is also an act, insofar as it prevents a certain outcome from materializing. It was argued in earlier chapters that the act was diluted to prevent the guarantee of "unproductive" or "useless" employment. If the work conceptualization of productivity did in fact help speed "non-passage," then the fact that the act is not listed as a separate heading could indicate that discourse was productive in keeping the legislation from influencing business practices.

For the second half of 1950, 16 entries are listed under the heading, Economic Cooperation Administration, or the body administering the Marshall Plan. A sampling of titles include the following, "The Marshall Plan will probably end this June. A new 'Economic support for rearmament' program will take its place;" "ECA aids patent swap: small business section in Paris sets up clearinghouse for licensing patents between US and European manufacturers;" and "There's some talk in Washington about merging all US aid to Europe." [1490]As with the titles published during the first half of the year, these titles strongly suggest that the

[1489] November 18, 1950 (p. 122)) and October 14, 1950 (p. 124), respectively
[1490] December 30, 1950 (p. 72), October 7, 1950 (p. 136) and September 2, 1950 (p. 83), respectively

European Recovery Act was *productive* in forging a trans-Atlantic alliance with multiple and multiplying consequences in terms of our business in the US and across the Atlantic was organized.

Under the heading, Bureau of Labor Statistics, 14 articles are listed, including the following: "The sensitive index of products widely used in manufacturing has shot up about 4% so far this month;" "Index of wholesale prices of industrial prices shows cost of rearming is costing much more than it did 10 years ago; " and "Wage boosts show fast upward pace."[1491]Again, the source of indices and links to wages, the BLS provides the numbers used to gauge decisions and outcomes; prices and wages are key to productivity figures at this time. No articles are listed under NBER during this second half.

***Business Week:* titles by topic and advertisements, first issue each month**

1. *Business Week*, first-half 1950: All articles listed under "Production"

The claim that productivity is associated with cost savings during this time period is clearly discernable by viewing the titles appearing in the magazine's "Production" section. Production is geared toward reduced costs, increased and/or more continuous processes – higher quantities.[1492]

Titles in this section are as follows:

•A boom in porcelain enamel … new developments in steel and frit-processing cut costs of enameling
•Automatic nut-maker fastens without nuts … big savings in manufacturing costs
•Mobile drill 'samples' a road … with these data, mixtures can be developed in the laboratory to meet specific road conditions, thus increase road life[1493]

•Display tells engineers: watch costs … assembly costs are biggest manufacturing expense.
•Theme: keep it simple" (photo caption) … Wright's new lab gives Ram jets a workout
•Fast renovation for aged gondolas," … Cars come off the line at the rate of six a day[1494]

[1491] July 15, 1950 (p. 9), July 22, 1950 (p. 9) and November 4, 1950 (p. 129), respectively
[1492] Language that specifically reflects these concepts are underlined.
[1493] January 7, 1950 (pp. 42, 49 and 51, respectively)
[1494] February 4, 1950 (pp. 46, 50, and 54, respectively)

•In a squeeze – concrete is stronger
•Will a third process take over now? … Steel Battelle develops process that promises to make steel with quality of open hearth, speed of Bessemer[1495]

•Extrusion Works with Steel … Military-sponsored research reports progress that will pay off commercially some day… The Germans produced some unusual things that way – gun barrels, projectiles, parts commonly made by forging and machining. But they didn't get to quantity production. American industry is a lot nearer that point right now
•Ticket to Stock Control … System is cheap, valuable for small companies with big inventories[1496]

•Humanizing machines saves money … the way workers see, feel, and move has become an important cost factor in machinery design – thanks to the war … psychology has plenty to do with efficient operation of any machinery that people have to run
•Silicones spread in eastern markets
•More speed: more tinplate," … Weirton Steel bids for more business with new, high-speed electrolyte tinplate line. It plates strip at a half-mile a minute, nearly twice as fast as conventional lines
•Six new devices for automatic control … which permits better fuel economy[1497]

•Exhaust put to work… Plenty of perfectly good energy goes out of the exhaust pipe of an internal combustion machine
•Magnetic clutch … Vickers develops line of magnetic clutches that use graphite instead of oil as iron suspension medium
•How to speed up air reservations … American thinks that its system might have applications outside the field of reservation work … In materials handling, for example, it could control inventories for organizations with far-flung operations[1498]

2. *Business Week*, first-half 1950: All articles listed under "Labor"

Articles listed under the magazine's "Labor" section are clearly concentrated on union activity – *not* how they are benefiting from productivity growth, note[1499] – with specific references to the Taft-Hartley Act not

[1495] March 4, 1950 (pp. 52 and 58, respectively)
[1496] April 1, 1950, pp. 64 and 70, respectively)
[1497] May 6, 1950, pp. 51, 54, 58 and 64, respectively)
[1498] June 3, 1950 (pp. 40, 44 and 46, respectively)

uncommon. A few articles do make references to the wellbeing of the workforce, but articles dealing with production stoppages and other issues linked to union power largely overpower those that cover the amelioration of labor conditions. These data largely square with one of the claim's made in chapter 4 that the scientific discourse, during this time period, focused on labor-savings processes and sheer production, breaking the direct link with "man" as the central source of productivity improvement, a central feature of Taylorism.

Titles in this section are the following:

•Still over Lewis' barrel … Washington doubts that an injunction will be much help to coal operators. Reason: a court probably wouldn't act on the three-day week, would only tell Lewis to resume bargaining
•Peace by injunction … Cleveland transit workers go back to work under city law that bans strikes by public employees. But it's an uneasy peace, and may cost Mayer Burke labor support as candidate against Taft
•Tough labor leaders are out of date … a good labor leader is one with brains: a sharp sense of strategy; and diplomacy in dealing with employers, legislative bodies, and the courts
•Ching sums up… Federal labor mediator thinks the labor picture looks bright despite – and even because of – strikes
•Electrical scrap warms up … right-wing, left-wing electrical unions vie for right to represent workers at major plants. General Electric sets stage by refusing to renew automatically its contract with ousted UE
•Plywood Co-ops … Worker-owned mills are on the risk on the West Coast. Good earnings and security are main reasons … one factor that accounts for the good earnings is the high productivity of men who have a share in the ownership and profits. One co-op member called the mills 'self-energizing from bottom to top'[1500]

•UAW, Chrysler Gird for Tough Battles … Union's new twist on pensions – demanding that 10 [cents] an hour be paid into a kitty – opposed by company as too inflexible
•Pension clear up … Goodyear and union agree on what happens to pensions if social security benefits are hiked by Congress
•Unions move in on garages
•Area-wide pensions up again

[1499] Of the articles listed, only three deal with work-week length; one article covers unemployment woes. Two articles cover employee-employer relations.
[1500] January 7, 1950, (pp. 61, 62, 63, 64, 65 and 66, respectively)

•Negotiated meals … Company dining rooms at isolated plants are a condition of employment. So prices are bargainable under Taft-Hartley

•Bell strike threat is bid for federal help

•Joint Action … AFL, CIO officially join for New York and Connecticut politics, as CIO get-Taft campaign bogs down[1501]

•Tough bargaining ahead … Union took GM's-2-cents–an-hour cut quietly. But it's primed with tough demands for bargaining over new contract in May. Outcome will set climate on whole labor front

•IUE takes last UE stronghold in St. Louis

•Who has T-H Say So? … By leaving jurisdiction questions up in the air, act paved way for row between counsel Denham and NLRB. Fight is over ideology as well as authority. Retirement of top men might ease breach

•Union income tax?"… Maybe … Congress may tax 'unrelated income of tax-exempt organizations, including unions

•Rehabilitation pays off … OVR [office of vocational rehabilitation] estimates that the average rehabilitated person pays back $10 in federal income taxes for every $1 that the government spends on his rehabilitation

•In-plant play: cheap and easy… Employees at the El Segundo, Calif., plant of Douglas Aircraft Co., Inc., are getting an added life from their twice-a-day 10-minute rest periods. During the breaks, they can now play shuffleboard or pitch horseshoes – right on the plant floor[1502]

•Court ruling may mean strike … Supreme Court says hiring halls are illegal … The court decided, finally, on Monday that hiring halls are illegal under the Taft-Hartley law

•Pension plans spread, but statistics lag … Since mid-1949, new pension plans have been spreading fast in steel, auto, glass and many other industries. But the Bureau of Labor Statistics has made no pretense of keeping up with the growth. What do fact finders find? … Expedient facts, not economic ones. Carrol Daughtery now thinks the pension pattern his steel fact-finding set last fall means trouble

• Firings fire UFE … Wall Street union opens new organizing drive, urging need for job protection and fight for five-day week

•At it again: NLRB internal troubles get even worse as Denham takes a dim view of dismissal of building union case

[1501] February 4, 1950 (pp. 84, 85, 86, 88, 90, 91 and 92, respectively)
[1502] March 4, 1950 (pp. 106, 107, 108, 112, 115 and 116, respectively)

•Unemployment creeps higher … Labor force keeps on growing so that number of jobless rises – even though employment is high. … In the midst of near-record prosperity, the federal government is beginning to worry about the unemployment insurance system
•Shorter rail week," First important group of operating rail workers get 40-hour week[1503]

•Not UE, not IUE, Just Trouble … That's what came out of the even split in the NLRB vote at Westinghouse. So now unions are gunning for victories at GE
•Chrysler Deal: a marathon … Bargaining to end UAW strike winds up as a novel non-stop business
•Know your company' tours build goodwill in Hawaii … Management's cure for this state of things is the "know your company" tour. On the surface, the idea is to let year-round employees see the whole Hawaiian Pineapple operation. But there's another goal: to narrow the gap between employer and employees
•Accent on security … Unions put new stress on severance pay, fearing layoffs some day; UAW contract is straw in wind
• Missouri muddle … State keeps Kansas City buses and streetcars running under utility antistrike law. But no strike is no solution[1504]

•GE poll brings no peace … Election was narrow victory for IUE—not enough to give it dominance over UE in the industry
• Area pensions … UAW claims first success in reaching area-wide pension agreement with 70 tool, die shops in Detroit area
• The 'natural' working day … In the light of the industry's present contracts with the CIO, these old work rules seem not only out of this world, but out of the planetary system
• Credit unions … Employees like them: they make savings—and cheap loans—easy. Management likes them. They boost worker morale
• "New—different … Labor looks for trouble from new head of House group. Barden is conservative; he could hold up anti-Taft-Hartley drive
• Pre-dawn phone calls anger sleepy strikers … If an employer telephones sleeping strikers before dawn and razzes them, is that an unfair labor practice? The National Labor Relations Board may have to decide[1505]

3. *Business Week*, first-half 1950: special articles dealing specifically with the issue of "productivity"

[1503] April 1, 1950 (pp. 86, 88, 90, 92, 93 and 94, respectively)
[1504] May 6, 1950 (pp. 108, 110, 115, 116 and 118, respectively)
[1505] June 3, 1950 (pp. 84, 88, 90, 94 and 96, respectively)

Although the theme of productivity is typically addressed, if only implicitly, in the articles subsumed under the titles, "production" and "labor," the topic is covered directly in 1950 issues of *Business Week*. The content of such articles lend credibility to the claim that the discourse on productivity, at this time, was linked to production processes and the fear of production losses. Moreover, the idea that the benefits of enhanced productivity should be distributed to the collective whole is also discussed in these articles, though it is equally clear from the text that benefits are not *automatically* distributed to those enhancing their efforts: ensuing displacement among workers requires government intervention. For example in an article from the March 4, 1950 issue of *Business Week,*[1506] "Unemployment, Prosperity: Strange Pair," bulleted items summarize key concerns:

- Labor productivity is rising, rising fast
- It's taking fewer workers each year to produce our high volume of goods – so unemployment is creeping up
- That's why Washington is worried about business prospects at a time when everything looks prosperous to most businessmen
- Moral: unless business expands a lot this year, watch for pump-priming – even in prosperity – to make it expand.

In the March 18, 1950 issue, an article[1507] entitled, "Productivity: promise and problem," addresses the social issues connected with the debates at the time about productivity. Sample statements include: Better productivity holds the promise of still better living. It is the way to make good on the things that people are talking about, and wanting, today: better wages, pensions on a more secure level for all workers, better social services. The country can have better educational systems, better housing, more medical care, adequate unemployment insurance, and all the rest – if we will buckle down to improving our industrial efficiency … As we see it, two things are needed to encourage better efficiency, and to minimize dislocation: (1) Our markets must be expanded to keep business expanding, and to provide enough jobs to

[1506] Page 19
[1507] The article comes from an editorial page, called, *The Trend,* which appears in each issue. Here the citations come from p. 144

maintain reasonably full employment … (2) The people who will be hurt as productivity improves will need help.

In other articles, the concept of efficiency surfaces as a legitimizing argument. For example, in a May 6, 1950 issue of Business Week covering a congressional debate, an article entitled, "'You and I clearly disagree,'"[1508] reveals the importance attached to the concept in terms of winning arguments. The sub-title of the article reads: That's what Ben Fairless told Rep. Celler I hearings on Big Steel. He said plenty more about his company's operations, stood pat on grounds that in US Steel's case bigness spells efficiency. In other words, "efficiency" legitimizes industry concentration.

4. *Business Week*, first-half 1950: selected advertisements reflecting the productivity discourse

Of all 392 advertisements published in the six issues reviewed (those above one-half page in size), at least 261, or 67%,[1509] refer explicitly to "cost-savings," "greater efficiency," "productivity," and/or "production speed" – these ads were counted under the "Productivity…" category. The estimate, as noted, is conservative because these notions are often implied in the advertisements; moreover, a portion of the advertisements published have nothing to do with production processes or products per se, for which these notions are most relevant (as opposed to advertisements regarding particular publications or states, for example). Other categories were created – those whose principle message could be linked to "Technology," "Quality" or "Competitiveness" so as to be able to compare the 1950 advertisement discourse with that published in the 1990 issues of *Business Week.*[1510] Further category breakdowns were included under each heading to capture the divide between products and services and, particularly, the proportion of ads that feature products as inputs – that is, as process-oriented goods (i.e., not consumer end-use products). Given the claims made throughout this and earlier chapters that the discourse privileged process as opposed to consumer products during this time, the breakdown is important as substantiation.

[1508] Page 24
[1509] As some substantiation, a first count conducted only on the basis of "productivity," that is, without the added categories delivered the percentage at 65% -- close, given the slight changes in documentation process (greater choices).
[1510] These categories best captured the main advertisement messages in the 1990 issues, and are reflected in the scientific and policy discourse in the preceding decades.

Of all 392 advertisements analyzed, the breakdown is as follows:[1511]

Technology, innovation, science = 8, of which

- *Product = 2*
- *Process = 2*
- *Service = 4*

Quality = 120, of which

- *Product = 5*
- *Process = 67*
- *Service = 48*

Productivity, efficiency, cost-savings, maximized production = 261, of which

- *Product = 2*
- *Process = 216*
- *Service = 43*

Competitiveness = 0

- *Product = 0*

[1511] See p. 419, figure 11.1 for a summary chart comparing these figures between 1950 and 1990 issues.

• *Process = 0*

• *Service = 0*

Other = 3

A sample of advertisement titles and content include the following:

•Whatever your business you can save time, work and money with Permacel industrial tapes
•Quick way to make large savings: continuous carton former
•Goodform aluminum adjustable chairs … Because this chair is adjustable to the individual, it will reduce fatigue, increase productivity, and promote health, thereby paying for itself in a short time
•McGraw-Hill Library of Business Management … to help you prepare now for what might come sooner than you expect, here are books giving you quick access to the fundamentals that promote executive efficiency
•The Ohio Power Company … Ohio is centrally located, near markets and sources of supply … Labor is ample, productive, friendly
•Mighty miner digs coal with help from the world's greatest lubrication knowledge … You, too, can put this program in your plant for more continuous output[1512]

Two advertisements in the February 4, 1950 issue are noteworthy in that they deploy strong rhetoric in defense of the values that lead to greater efficiency. In a Bankers Trust Company ad, it is noted that, "The impressive record written by the suppliers of electrical energy and equipment shows once again what can be accomplished by productive labor, capable management and thousands of individual investors under a competitive business system that is free." In the Ceco Steel ad, already noted on page 387, the company urges a stop from increasing taxation: "It must show that excessive taxation is creating a competition to

[1512] January 7, 1950 (pp. 2-3, 28, 58, 75, 82 and 93, respectively)

industry which is challenging its right to lead – its right to guarantee economic freedom to people … New vigor must fire appreciation of the system of individual effort and reward."[1513]

Additional titles:

•Canadian International Trade Fair … Every private businessman and such company officials as these … whose services contribute to the efficiency and profit of their firms
•Metropolitan Oakland Area California … Here the rich Bay Area market of 2.6 million people is at your door. Highest labor productivity, equable climate cut production costs
•McGraw-Hill Publications … This man wouldn't neglect a machine in his plant … yet he hasn't had a chest x-ray! … A chest x-ray is the first step toward detecting tuberculosis in its early stages. And in its early stages it can be cured with the least loss of time from work[1514]

•Overtime begins at 9 A.M. … If you're paying for hand methods of doing paperwork, which could be done by machines, it's just like paying overtime rates all day every day. With Addressograph simplified business methods, descriptions, numbers and names are put on paper at least thirty times as fast as a typist can do it – and with perfect accuracy[1515]

•More time gained – more work done, when ear-tuned jewel-action givens your words "letter perfect" transmission
•Drudgery is disappearing … first from washing the clothes ... now from doing the dishes … the 'brain' of most of these labor-saving machines of both types is the Mallory interval timer switch … It does much of the thinking as well as the work for the modern housewife. The Mallory interval timer switch has become standard equipment for almost every manufacturer of automatic washers[1516]

•General Fireproofing … I sure like to work at my new GF desk … Certainly she likes to work at her new GF desk and so does every office employee who is fortunate enough to have one. GF metal desks in their lustrous gray finish and anodized aluminum trim increase employee morale, improve efficiency, make a favorable impression on your customers and last indefinitely

[1513] Pages 1 and 53, respectively
[1514] March 4, 1950 (pp. 61, 99 and 103, respectively)
[1515] April 1, 1950 (p. 91)
[1516] May 6, 1950 (pp. 91 and 121, respectively)

•Armstrong's cushiontone: it's quieter these days in Buffalo … How important is quiet? Perhaps you've never thought about it, but in Buffalo, businessmen have found that quiet boosts employee efficiency, adds comfort and pleases customers

•Hauserman steel interiors: distinctively beautiful ... easy to move. Interiors by Hauserman are a good investment for your offices, shops and laboratories. Visitors are impressed with their handsome appearance and employees respond to their pleasant, efficient surroundings[1517]

The popular discourse in the United States during the 1980s and 1990s: the question of timing

During 1950, *Business Week* clearly exhibited a process-oriented conceptualization of productivity: both editorial advertisement content was heavily concentrated on labor-savings machinery, in particular, and efficiency, more generally. Products were valued only insofar as they could deliver one or the other. The fact that this language continues to be dominant in 1950 begs the question of timing: does the popular discourse lag the scientific and policy discourse? This question is of interest to ask because it would help explain a mechanism of spread: numbers and scientific experts ground legitimacy, helping to move policy forward – and policy may be initiated because of the numbers, as was seen with declining productivity growth figures and the call for a national innovation act. We might reasonably expect policy to translate into organizational changes in the economy. If true, the popular discourse shift could be expected to lag the numbers and policy shifts.

It is not clear by analyzing the popular discourse in 1950 on its own whether or not such a scenario actually plays out: while it is true that the 1950 discourse seems to have changed little from what scientific and policy papers were developing during the earlier postwar years, much of the scientific work on material product – quality measures and price indices – began to gain momentum in scientific papers and congressional hearings only during the early 1960s. However, a lag is discernable in the popular press (i.e.,

[1517] June 3, 1950 (pp. 42, 54 and 79, respectively)

Business Week) from issues published in 1980 and in 1990. For example, some advertisements published in 1980 issues continue to use the word "efficiency," while the word is virtually absent in the 1990 issues. Also: "technology and innovation" – the reconstructed way in which the productivity discourse continued to exert its influence in policy circles during the 1980s – is not fully represented in the 1980 issues.[1518] Although the Stevenson-Wydler Act was not passed until October 1980, congressional hearings on technology and innovation had taken place in good measure already during the mid- to late-1970s. In terms of the scientific debate, Solow's 1957 article can be argued to have catalyzed (or lent starting momentum to) the focus on "technology" in the scientific literature, far earlier than the technology debates of the 1970s. In fact, the most telling indication of a lag can be inferred from the fact that R&D rankings figured in the 1990 issues, as well as a strong focus on foreign competition, not apparent in the 1980 issues.

As an indication of a broad shift in topic focus, only two articles of the approximately 2,550 articles[1519] published in 1990 were published under the heading "Labor"; no "Production" heading was included in the 1990 issues of *Business Week.* Under "Information Processing," 29 articles were listed; under "Science and Technology," the number was 26. These counts – like those for "Labor" and "Production" in the 1950s, are exceptionally minimal because these themes were commonly addressed in many different articles under various headings – these counts represent those under these particular headings, only. As such, these numbers provide tentative evidence – plausible evidence – for shifts in the popular press that follow transformations in the scientific and policy discourses.

Inferences can also be drawn from the fact that "Technology" and "Science" as categories are wholly absent in the two first- and second-half year indices for *Business Week,* 1950s. In the first-half year index, "Technical services" provides a minor head, and under "Science" readers are referred to another heading, "National Science Foundation," under which a few articles covering laws and the NSF are listed. Clearly,

[1518] Only three cover titles featuring "technology" or "high technology" are documented for 1980 (from January to February and then from May to December).
[1519] This figure was arrived at by averaging the number of articles in the first issue of each month, from January to June 1990 (an average for the whole month of January was calculate, because the first issue was a "special issue." This average was then multiplied by 50, or the number of issues in 1990.

science and technology "existed" in the 1950s; in fact the heading "research" is included as one of the 1950 editorial departments. It is difficult to understand how to interpret the differences; however, "research" per se, is not featured in the 1950 cover stories – one fact that suggests its importance is less in 1950 than in 1990.

The timing sketch is exactly that: a sketch based on inference. It makes logical sense that numbers and scientific experts secure legitimacy for productivity conceptualizations. This legitimacy spreads to policy circles and legislative chambers, as evidenced by the recruitment of scientific experts to provide testimony for policies under debate and the fact that numbers provided a clarion call for action. That policy would then influence economic activity more generally and become reflected in the popular press is, also, not counter-intuitive. Indeed, the way in which Taft-Hartley is covered in the 1950 issues of *Business Week* would seem to lend support for this assertion. In brief, the scenario proposed is logically plausible. Whether or not feedback loops – or some kind of endogenous mechanisms – then influence the scientific and policy discourse is something that might be further inferred but would be more difficult to support with the logic of timing and would require further research.

Evidence for the effects of legislation on technology and innovation. In the coverage of the 1950 *Business Week* issues, the editorial content featured Taft-Hartley in multiple issues, providing evidence for the influencing effect of this legislation. The way in which Stevenson-Wydler and Bayh-Dole may have been covered during the 1980 and 1990 issues of *Business Week* proved more difficult to assess, as yearly topic indices for these dates are not available. As an alternative, searches were conducted on Google, which revealed that these pieces of legislation on innovation were being covered in *Business Week* as recently as 2010. In a web-based article published by *Bloomberg Businessweek* (February 19, 2010), an article titled, "Defending the University Tech Transfer System,"[1520] is featured, with a mention of Bayh-Dole in its subhead. From such, it can at least be inferred that the legislation had staying power in the popular press. A deal between Monsanto and Washington University in St. Louis is covered in a February 5, 1990 issue of

[1520] http://www.businessweek.com/smallbiz/content/feb2010/sb20100219_307735.htm

Business Week, as one example of how this legislation is covered in the popular press.[1521] In an earlier issue, June 23, 1986, an article titled, "Now, R&D is corporate America's answer to Japan Inc,"[1522] provides coverage on corporation and university collaboration – a direct result of Bayh-Dole. The article, followed by an *R&D Scoreboard*[1523] for industry, stresses that corporate R&D outlays have grown in the double-digits since 1979 – more evidence that the legislation was powerfully organizing in its reach, but also the fact that these data are presented in the popular press is one way that the effects becomes legitimized and reproduced to keep the discourse churning along: research collaboration between universities and industry is part of "how things commonly work." More generally, the fact that the discourse on competitiveness and innovation – the language of Stevenson-Wydler and Bayh-Dole – began slowly to overtake the editorial and advertising pages in the years following legislation passage suggests that the discourse had spread from congress to the general public. The following sections detail the editorial and advertising content featured in the 1990 issues of *Business Week.*[1524]

Data collection and overview. As no indices were published for the 1990 issues of *Business Week,* article content documentation was less evident. The total number of articles published in 1990 was roughly estimated at 2,703.[1525] Again, because of the extent of the data available, data from only the first half of 1990 were evaluated for editorial and advertisement content. As a simple rule of thumb, as was done for the 1950 issues, the first issue of each month was chosen.[1526] To keep comparisons parallel, documentation was carried out for articles covering "Labor" and "Production." Articles falling under new department headings,

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[1521] See p. 409.
[1522] Pages 134-138
[1523] Pages 139-156
[1524] The year 1990 was chosen to allow for the perceived lag in the transfer from the scientific and policy discourse to the popular discourse. In the 1980 issues, for example, "Labor" as an editorial title, appears in 3 of the 12 issues selected, while "Technology" features articles in only 1 of the (same) issues selected, which are the first issues of each month during 1980, Advertisements continue to feature "efficacy-oriented" messages, such as "74% of today's office workers say they could do more …" (January 14, 1980, cover page advertisement) and "Englehard Precious Metals Technology means better yields …" (January 28, 1980, p. 29). The lag is also explored by analyzing cover stories in the 1980s.
[1525] An average number of articles for the first issue from January to June was multiplied by the number of issues (51x 53 = 2,703)
[1526] Data comparisons are kept to the first half of the year of both years under study; titles for the whole year are included as a way to gauge the continuity of the discourse content.

such as "Information processing" and "Science and Technology" were also tallied and analyzed, under the premise that the discourse had shifted towards these concepts by the 1990s.

***Business Week*, 1990, titles by topic and advertisement, first issue of each month**

Unlike in the 1950 issues of *Business Week,* issues from 1990 have *no* "Production" section. This fact is interesting and important to note; if productivity as "production process" is presumed to have shifted during the 1960s to material product and then on to intellectual product by the 1980s and 1990s, then this result would appear to square with claims being made. "Labor," as an editorial department, remains in the 1990 issues of the weekly, but its content weight has lessoned considerably – *two titles for the whole year in 1990 versus 36 titles for half a year during 1950* – a preliminary indication of a shift. Also as would be predicted by theory: new department headings – "Information processing" and "Science and technology" – appear in the 1980 and 1990 issues.

1. *Business Week*, 1990: all articles listed under "Labor"

As argued earlier, the editorial focus on labor is expected to diminish dramatically. In the two articles that do cover the topic (below), it is clear that unions are being discredited by linking them with outdated practices in eastern Europe, for example. In any event, this title in and of itself, coupled with the fact that labor is so rarely covered in the 1990 issues of *Business Week*, fairly clearly demonstrate the sidelining of labor coverage in the popular press at this time.

Titles under this department heading are as follows:

- Revolt at the Teamsters … For the teamsters, it's 'Like in Eastern Europe' … rank and file dissent and lawsuits may finally push out the union's old guard[1527]
- How to work the line and influence people … The Dale Carnegie crew meets the blue-collar crowd [1528]

2. *Business Week*, 1990: all articles listed under "Information processing"

[1527]March 5, 1990,(p. 66)
[1528]May 7, 1990, (pp. 140L-N)

As has been argued throughout this study, productivity growth is claimed to have shifted from process during the early postwar years to intellectual product during the 1980s. Information processing, as an "intellectual product," or one that is (socially, at least) linked with "high technology" or is invested with "knowledge," can be both a process input and a consumer end product. The argument being made in this study is that the focus turns to products, per se, not production inputs. This claim is tentatively supported by the fact that rankings and public debates at this time centered on competition and firm market shares (as well as country market shares) derived from intellectual ("high-tech") products – not on cost-savings from the integration of such products into production processes.

This is not to suggest that "high-tech" products were not also considered key to productivity growth – they were. The fixation on the productivity paradox during this time lends credence to this claim; the scientific literature provides evidence of the efforts to try and discern the link between computer use and more efficient production processes. But the association between competitiveness and productivity growth – made by some policymakers and economists, though contested by others[1529] – suggests that growth would mainly be achieved by winning market shares through the sale of high-tech products worldwide. Using high-tech to render production processes less costly came in as a distant second in terms of its primary value. If market share were the main concern, financial deal-making would presumably figure as a more important topic to cover in the popular business press, than the mechanics of production, per se. In short, if the claims are true, or are at least plausible, we would expect a product- and/or financial-oriented coverage in the popular press of high-tech issues at every level: cover features, editorial content and advertisement. Such would not exclude coverage on the way in which high-tech, or more specifically information processing (for this section), are useful in solving production issues. But, it does suggest that coverage should at least be mixed.

<u>Titles under this department heading are as follows:</u>

[1529] See chapter 8 for a discussion on the emergence of the competitiveness discourse and its link with productivity.

• Bits & Bytes … Mrs. Fields Cookies, fault-tolerant computers, software's books, Lotus for workstations, tracking rigs by PC
• The turnaround at TELCO … The phone-gear maker is well again – and filling some very hot niches[1530]
• If it ain't broke … diving demand has made computer maintenance a cut-throat business
• Lonely computer repairmen … Heat from Japanese rivals has forged more reliable US machines
• Graphic improvements … Chart-making software is helping turn Digital Research around[1531]

• Survival of the biggest … the urge to merge hits mainframe software – to Big Blue's delight
• What becomes Legent most … the software maker shops and shop … CEO Henson wants sales of $1 billion for the software maker by 1995[1532]

• Death to the clones? The EC wants copyrights to the teeth … A proposed EC copyright law would strengthen computer giants
• Niche work – and they get it … IDEAssociates find opportunities … This time, IDEAssociates' target is network 'controllers'
• Bits & Bytes … Nintendo mania, E-mail, videotex, data processing quality, area codes[1533]

• A software kingmaker? Bobby Orbach's startup wants to bring brains and bucks together
• Bits& Bytes … A sight for software-sore eyes, tapping the keyboard for quotable quips, US hardware is even starting to pall over there, Can an IBM whiz clean up Ashton-Tate's mess, Sony tries to reinvent the paperback[1534]

• A hot market for software … To maintain their world leadership, US companies flock to Japan … that's where American companies are setting up shop to maintain their world leadership
• Commentary… Congress should put a lid on what credit bureaus let out[1535]

• Bits & Bytes … Ship to shore via PC, caller ID, Sun, easing fax-lock, the Statue of Liberty
• Fear of hackers … Computer security is booming – but 'there are some charlatans out there'
• Commentary … Quashing computer anarchism [1536]

[1530] February 5, 1990 (pp. 82A-82E)
[1531] March 5, 1990 (pp. 82-84D)
[1532] April 2, 1990 (pp. 66-68)
[1533] May 7, 1990 (pp 138-140I)
[1534] June 4, 1990 (pp. 110D-110H)
[1535] July 2, 1990 (pp. 56-57)

• Venture capital's sweetie … Software startups never had it better … With hardware startups struggling, software suddenly is king
• Bits and Bytes … A collectors' network, IBM, a Macintosh thesaurus, PC clones, no-mess computer hookups[1537]

• IBM vs. Microsoft … The feuding collaborators have recast their relationship … They agree to stick to one operating system – but not the same one
• Big Blue's red face … So where's the Superserver, already?
• Bits & Bytes … Talking troubleshooter, NCR's new line, a GEnie of your own, PC price cuts, AT&T's Desert Fax[1538]

• PC Makers have a virus … Suddenly, they're not growing much … The threats of recession and war are slowing growth to a standstill
• A Bloodbath? PC dealers are bracing for the worst
• Red ink from color copiers … Mead's new process hasn't caught on … A $175 million investment returned just $4 million in sales last year
• Bits & Bytes … Selling condos with do-it-yourself design, price-gouging phone services will get a shorter cord, PCs are entering a new dimension, the cellular-standard war grinds on, expert assistance for accountants[1539]

• Oracle's toned-down future … A stock collapse has the software giant crumbling its pell-mell expansion … and slapdash sales practices
• Satellite TV static … No lift-off for broadcasters
• Bits & Bytes … PC buyers, Baby Bells, computer deals, laptop power, tiny desk drives[1540]

3. *Business Week*, 1990, all articles listed under "Science and technology"

Editorial content falling under the department heading, "Science and technology" would be likely to generate results similar to those argued for the "information processing" section. That is, if claims about the shifting discourse hold any water, then we would expect science topics to link with consumer products and

[1536] August, 6, 1990 (pp. 70A-72)
[1537] September 3, 1990 (pp. 102-102C)
[1538] October 1, 1990 (pp. 164-168E)
[1539] November 5, 1990 (pp. 140-142E)
[1540] December 3, 1990 (pp. 156-158C)

firm competition, rather than overwhelmingly in terms of how "science" would render production more efficient. *Which* science would be likely to be covered is a complicated enquiry – IT had an editorial heading of its own. It may be relevant to note that biotechnology figures as one of the technology areas privileged in French plans,[1541] and that the President of Merck, Sharp and Dohme, Roy Vagelos was one of the high-profile experts providing testimony in the innovation and patent congressional debates of 1980 – timing, again, is important to note.[1542] Biotechnology and related drug applications did figure prominently in policy circles. Scholars Slaughter and Rhoades claim that the health-care industry, indeed, lobbied congress to "join the competitiveness race."[1543] Whether or not the health-care industry used political power to achieve corporate ends is not – at least here – at issue. Why this matters to the current study is that Slaughter and Rhoades claim that the legitimizing language of "competitiveness" pushed policy measures forward; discourse provided the opening. Discerning a focus on pharmaceuticals and the health-care industry in the popular business press would lend credibility to the claim that policy content later becomes reflected in the popular press.

Titles under this department heading are as follows:

• Developments to watch: Get a grip on your forehand with this new racquet, Two top guns in video team up for HDTV, Why Monsanto keeps going to school, How much are companies really spending on research, protective outdoor carpeting for your car[1544]

• Developments to watch: 'Uh doctor, I think you should take a look at this computer,' Putting the finishing touches on a safe blood supply, The latest hot subject on campus? Data-storage research, a cool idea for adapting superconductors to chips

• Revolutionary R_x … 'Antisense drugs could shake up the pharmaceuticals industry [1545]

• Finding cancer's roots … Genetic research is now the main focus of a frustrating effort

[1541] See chapter 9.
[1542] See chapter 10.
[1543] See chapter 10.
[1544] February 5, 1990 (p. 63) Note that the short article on Monsanto is referring to collaboration between Washington University in St. Louis and Monsanto, clearly based on the Bayh-Dole Act. This section begins with February, as the January 8, 1990 issue was a special feature issue.
[1545] March 5, 1990 (pp. 85-89)

• The case of the missing gene … How cancer's family ties are traced
• Developments to watch … Darkroom – quality pictures – from a computer printer, Why Texas Instruments and Kobe make a nice couple, Is Japanese industry ripe for some soul-searching, Silicon holds its own, even in super-speedy circuits, IT attacks barnacles at sea – and crime on land[1546]

• A battle in a bathtub … CEO Friedley couldn't turn around Tektronix. Now he's out. [Quote from Friedley: "Some of our whiz-bang people wouldn't know a customer if they saw one."]
• Developments to watch: The dipstick meets the computer age, Water: a miracle cure for cystic fibrosis, Just send the funnies, please [electrically conductive plastic for printing plates], This stereo plays CDs in the dining room and FM in the family room, Taking a tip from the tin man [treatment for osteoarthritis][1547]

• Developments to watch: A safer way to track worn-out train wheels, Forgot to watch Casablanca – help is on the way, A button tough enough for superman's shirt, Scientists are closing in on a cure for Lyme Disease, How to spot bargains from behind the wheel [short-distance transmitters]
• The tiniest toxic avengers … more cleanup companies are using bacteria that gobble up wastes[1548]

• Help for the ozone … the global pact to end CFC use includes aid for developing nations
• Riding a Russian rocket … [photo caption: Soviet cosmonauts aboard MR help grow protein crystals during payload systems' experiment]
• Clearing up cloudy vision –with microwaves, Fill 'er up with natural gas, please, A lesson from the Raiders: cut spending – but not on R&D, A tiny laser that packs a mighty wallop, These 'Kamikaze chemicals' lure bad enzymes[1549]

• Caught in the Valdez' wake … since the spill, Alaska has been scrambling to satisfy regulators
• Alaska's bad habit … can the state wean itself from its dependence on oil?
• Developments to watch: Caller ID is already earning new tricks, Counterfeiters beware: this copier leaves a trail, Genetic fingerprints aren't always so foolproof, Heavy plastic may be head for the head, A brain-on-a-chip to make TV sets super-smart[1550]

• Igor to the rescue … how Sikorsky and others are taming oceans of computerized data
• A common framework … covering the data bases

[1546] April 2, 1990 (pp. 82-87)
[1547] May 7, 1990 (pp. 122-125)
[1548] June 4, 1990 (pp. 95-98)
[1549] July 2, 1990 (pp. 58-60)
[1550] August 6, 1990 (pp. 74-79)

• Romancing the gallstone … 'more glamorous' and cheaper removal methods vie for supremacy
• Developments to watch: Working up steam over hot dry rock [untapped energy sources], A way to spot Alzheimer's before it's too late, HDTV may have just gotten a lot cheaper, Coming to bat: an entire lineup of 'left-handed' molecules, 'Hello, I'm Touch 2000 – I'll be your waiter this evening' [1551]

• Biotech's sharpshooters … gene targeting may let them draw a bead on hereditary disease or create drug-producing animals
• Developments to watch: A driller's nightmare may be a dream energy source, Soon you can put that picture of granny on a digital disk, Turning off cystic fibrosis with the switch of a gene, This insulin doesn't take effect until you need it, Why pressure chambers keep packing 'em in [Added oxygen for medical treatments][1552]

• Crisis at the NIH … funding cuts, scandals, and politics are taking their toll on the venerable biomedical research agency
• Developments to watch: Solving the mysteries of what little chips are made of, Big science is dodging the budget's slings and arrows, It's just like cobalt – only safer, This microscope has a new lens on life, What makes nifty pizza and works below minimum wage[1553]

• Developments to watch: How to find out how gracefully you're aging, Soon, 'anti-sense' will be more than a drug theory, A piece of the 'Yuppie Flu' puzzle falls into place, US food factories: the good, the bad and the ugly, Keeping killer chemicals at bay during heart attacks
• Red-hot research … drug companies and labs are racing to learn how the complex chemical changes[1554]

Clearly, medical research sits on the front lines of "science and technology" in the 1990 issues of *Business Week.* So what? It would seem that popular discourse followed policy initiatives: technology titles in the 1980 issues of *Business Week* cover robots, videodiscs, and computer software.[1555] The cover story in the May 28, 1990 issue of the weekly, in fact, singles out "The Genetic Age … " as the new revolutionary path in medicine. A special industry-wide issue (January 4, 1990) listed pharmaceuticals as one of the four components of "high-tech" industry. Although the evidence is not overwhelming, it would seem as though there are grounds to presume that coverage in the popular press follows policy initiatives – not vice versa.

[1551] September 3, 1990 (pp. 103-111)
[1552] October 1, 1990 (pp. 60-69)
[1553] November 1, 1990 (pp. 145-151)
[1554] December 3, 1990 (pp. 163-170)
[1555] 1980 issues from January to February and from April to December were analyzed.

Business Week did not feature a gene on one of its 1979 covers to be followed by legislation that would jumpstart a pattern of activity in the field of biomedical research.

4. Three special issues 1990s on technology

The issue of "technology," more broadly, was the focus of three special reports in 1990. One issue (January 8, 1990)[1556] covered industry in general, with some sections devoted to technology, "Industry outlook: manufacturing; services; *high technology* (computers, semiconductors, telecommunications, pharmaceuticals); natural resources; finance." Much of the coverage under the heading "high technology" details sales concerns, as evidenced by the opening sentence on *computers:* "There will be tough times in the computer industry this year … business is slowing as buyers tighten their belts, wait for confusing standards issues to sort out, and try to digest the cheap computing power they have wolfed down in recent years."[1557] For s*emiconductors,* coverage reveals how US chip makers are continuing to lose world market share to foreign competitors – mainly Japan.[1558] In the story on *telecommunications,* coverage centers of the effects of deregulation. Interestingly, the articles point out that the Federal Communications Commission had eliminated caps on rates of return, "The caps on returns meant that profits from *more efficient operation* often had to be given back to customer. Now, cost-cutting can flow directly to the bottom line."[1559] In this case, effectively, deregulation is serving to transfer productivity benefits from consumers to producers – again, a distributional issue that rarely is addressed in either the scientific or policy discourses. Finally, under *Pharmaceuticals,* the article claims that price crackdowns on the part of congress are likely to have the effect of downsizing R&D budgets and also notes the rapid pace of merger activity in this industry sector threatens smaller companies, placing them at a competitive disadvantage. Competition, then, is paired not so much with productivity, but with company size – hence, also, the deepening focus on deal-making and financial strategy, ever further from the nuts and bolts of production processes dominating the 1950 issues of *Business Week*. The links between competition, pricing, company size, productivity and R&D budgets are anything but direct and clear; roductivity may serve as a legitimizing concept for

[1556] Pages 61-122
[1557] Page 97
[1558] Page 100
[1559] Page 101. Emphasis added.

business strategies, but the outcome produced could quite arguably veer in a multitude of directions not remotely connected to the level of output per input invested.

In a February 5, 1990 issue,[1560] a "special cover story," "The future of Silicon Valley" is featured. The sub-head for this title is: "Do we need a high-tech industrial policy?" The debate is split between those who believe, "The US must take drastic action to save its high-technology industry. US companies can't compete when foreign countries protect their own markets and subsidize exports" and those, who ascribe to the idea that "Government intervention in the market is costly, ineffective, and overly political. America's entrepreneurs and its well-managed companies are the best competitive weapons."[1561] Again, Japan is singled out as the US' largest threat. In a pull-out chart, "Silicon Valley's recipe for competitiveness" is detailed. Here the contestation about government's role in the development of high-growth sectors is evident in the popular discourse, as well.

Already again, "Innovation" was the title for a June 15, 1990 special issue, "Innovation: the Global Race," with the following sub-heads: *What's hot in product design; Europe and Japan take on the US; The world's most innovative companies; and the R&D scoreboard plus top consortiums.* For the latter, under the table of contents, the header reads, "US investment in R&D outstrips that of any other nation … but its rivals are boosting outlays fast, while in American spending growth has been drifting downward." Here the switch to this new indicator as a way to keep America in the top ranking is notable, as is the call to action: the US cannot afford to be complacent vis-à-vis the competition.

<u>Short-term measures include</u>:

• *Lower-cost capital* (create 'patient' venture-capital corporation with funding from industry, investors and government; provide federal aid for critical but very risky technologies; make R&D tax credits permanent; and shorten depreciation schedules for high-tech factory equipment);

• *Fair trade* (Enforce existing antidumping laws); and

[1560] Pages 54-60
[1561] Title page.

• *Antitrust reform* (Exempt collaborative manufacturing under some conditions; and eliminate triple damages in private suits against corporations)

Long-term measures include:

• *Lower-cost capital* (Stimulate more savings; trim the federal deficit; reduce consumer and business debt; curtail leveraged buyouts; and index the capital gains tax, to zero on long-term investments; and end double taxation on corporate dividends;

• *Fair trade* (Require reciprocity when foreign nations allow predatory pricing); and

• *Antitrust reform* (Adjust the rules to take into account offshore competition)[1562]

Clearly, the language of competition has eclipsed the language of productivity. Even though official bodies such as the NSF, as well as some economists, connect the two concepts, the "raw" rhetoric of productivity is greatly diminished. What is also important to note is the fact that a mainstream business weekly is, effectively, suggesting that legislation be initiated to create "patient capital," and a host of other measures intended to confer a greater competitive edge on the US, compared with its chief competitor, Japan. The discussion shows how the popular discourse can feed back into the policy and scientific discourse: "patient capital," an institution credited to CME economies in the varieties of capitalism literature, appears to need discourse in order to make it happen – and it can happen, or at least it can be lobbied for, in a "liberal" economy, such as the United States.

5. *Business Week*, first-half of 1990: selected advertisements reflecting the "innovation" discourse, first issue of each month

As might be expected, the advertising discourse is far less focused in the 1990 issues of *Business Week* compared with that tracked for 1950, when "efficiency" and "cost-savings" and all such language virtually dominated the ad pages. In the 1990s, language was loosely divided between "innovation," "technology," "productivity," and – importantly – "quality." The latter provides fairly convincing evidence that the discourse has, indeed, shifted from process to product, in general, and to intellectual product, in particular.

[1562] Page 57

Because the discourse language of productivity was more diffuse in the 1990s compared with that in the 1950s, an attempt was made to reflect a broader interpretation of productivity by breaking the categories tabulated into finer divisions.[1563] For example, advertisements (over half a page) are divided into four major categories: "Technology, innovation, and science"; "Quality"; "Productivity, efficiency, cost-savings, maximized production"; and "Competitiveness." Each of these categories, in turn, are divided in "Product"; "Information technologies"; and "Services." The latter division was made in order to discern the extent to which services had become an important element of the discourse. The distinction between IT and services is not always clear; hence the reason for creating a separate category for IT. It is important to note that the division for the 1950 advertisements included "process," and not "IT," the latter for obvious reasons. Because IT is sometimes used as a production input, it can be argued to at least partially replace "process." *Most importantly*, "process" as a broader category was eliminated because, apart from IT, 1990 advertisements did not feature goods that would sell as production inputs.

Of all 350 advertisements analyzed,[1564] the breakdown is as follows:

Technology, innovation, science = 52, of which

- *Product = 14*
- *IT = 25*
- *Service = 13*

Quality = 215, of which

- *Product = 63*
- *IT = 55*
- *Service = 97*

Productivity, efficiency, cost-savings, maximized production = 49, of which

- *Product = 11*

[1563] These finer divisions, reflecting major groups of "ad main messages" were added in the 1950 counts to enable comparison.
[1564] As was done for the 1950 issues, only advertisements one-half page in length or greater were included in the 1990 counts.

• *IT = 20*

• *Service = 18*

Competitiveness = 9, of which

• *Product = 3*

• *IT = 3*

• *Service = 3*

Other = 25

A sample of advertisement titles and content include the following

• Hitachi: How to record a star 160,000 light-years away … How to record a star right at home (One day, this toddler's children will watch her first steps) … It goes to show that Hitachi is as adept at creating products that are light-years apart as we are at creating technologies that are light-years ahead.[1565]

•NeXT Computer: The Best Computer for Publishing Ever Made … The words are those of Jonathan Seybold, perhaps the most respected voice in desktop publishing …Ours is the only system to offer optical storage as a standard feature.[1566]

•The new SL: The most passionate statement of engineering leadership Mercedes-Benz has ever made … Of course it is fast. Of course it is nimble. Of course it corners on proverbial rails. And of course it brings dramatic innovations, in everything from engine technology to aerodynamics to occupant restraint….[1567]

•Hewlett Packard: What you are looking at includes parts and labor ... Your project demands innovation on a deadline. Your current design applications aren't well connected to manufacturing. And your team isn't getting the help it needs to make those applications work. Hewlettt-Packard has a better way….[1568]

•The Bend Over Backwards Copier Guarantee from Kodak … Kodak copier representatives will do whatever it takes to guarantee your total satisfaction with Kodak copiers, people and service. Whatever it takes.[1569]

[1565] January 8, 1990 (cover-page ad)
[1566] January 15, 1990 (cover-page ad)
[1567] January 22, 1990
[1568] January 29, 1990

•Rolls Royce: Taking six months to build one seems quite reasonable considering how long an owner may keep one … It take as long to build a Rolls Royce motor car today as it did nearly a century ago. But then handcraftsmanship is a caring, patient process that cannot be hurried.[1570]

•Super Fleet: Think of our inter-modal service as sleeping cars for freight. Wouldn't it be great if your freight traveled as smoothly and undisturbed as your best night's sleep? Well, that's what it's like on Santa Fe's Super Fleet. We've innovated technology that gives our inter-modal service one of the smoothest rides on earth."[1571]

•Whitegmc: How to roll out a strong corporate image …It's pride that drives the companies that stand out from the rest. Pride that finds its way out through the people, and the posture the company assumes in everything it does. There's a special command of markets and destiny. A special understanding of the competitive power of corporate identity....[1572]

•AMP: Something remarkable happens when ideas come together … In a complex world, things get simpler. There is tremendous power in bringing together ideas from many sources and disciplines. This power has shaped our attitudes toward business. Most of our products have come out of 'early involvement' programs with our customers. They simplify assembly, and often simplify the end product, as well. The same approach goes beyond cost reduction and improved responsiveness. It can address many shared interests – issues driving the global marketplace, and broad concerns such as workforce development and environmental progress.[1573]

•Boeing: You know at least one word that's spoken in 120 nations around the world … You'll hear it said in Japanese. You'll hear it said in French. And Arabic. Chinese. Hindi. Portuguese. In fact, you'll hear it in almost any language almost anywhere. The word? "Boeing."[1574]

•Anderson Consulting *Starting line (tortoise and the hare, pictured)*: Today they would both be losers … Read any good fairy tales lately? Like the one about a steady, unchanging approach keeping a company

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[1569] February 26, 1990 (pp. 2-3)
[1570] March 5, 1990 (p. 7)
[1571] March 12, 1990 (p. 32)
[1572] March 19, 1990 (pp. 34b-34c)
[1573] March 26, 1990 (p. 92U)
[1574] April 2, 1990 (pp. 1-2)

competitive? Then look around. There aren't many tortoises left. They have been overtaken by swifter, technologically drive competitors. Of course, Anderson Consulting isn't suggesting that you model your business on the hare either. Speed without strategy is ultimately a losing formula. Especially when it comes to information technology.[1575]

•Intergraph lets you see the forest and the trees … A good strategy is to have one. Especially when it comes to managing your technical environment. But too many companies see the trees and lose sight of the forest. The miss the big picture, so they miss big opportunities. That's why its' important to think globally and act locally. To know which way the winds of technological change are blowing. How do we know? Because for 20 years we've managed our own technological forest. We've introduced the most advanced interactive graphics workstations and software products in the world.[1576]

•Texas Instruments: Mega Chip Technologies ... Texas Instruments can help you apply the power of innovation to pass the toughest product test of all, the human test …Technology is a sure route to the buyer's heart for many manufacturers. … Sony's state-of-the-art compact disc player has become the digital reference standard, reproducing the very essence of sound.[1577]

•Westinghouse: The best known unknown company in America. Communities: One of America's leading developer of quality communities … Industries: Providing world-class technologies to industries … Office systems: leading the way in integrating people and technology …[1578]

•Du Pont: We've got to stop treating our garbage like garbage… The bottle may be empty, yet it's anything but trash. In fact, this empty bottle is actually full of potential. Thanks to recycling… With recycling, we believe that plastic will be increasingly appreciated for filling valuable human needs instead of valuable land. At Du Pont, our dedication to quality makes the things that make a difference.[1579]

Broadly analyzed, the advertisements here featured convey a language of consumer satisfaction, or product qualities that are not necessarily linked with conceptions of efficiency-enhancing products, as was apparent in the 1950 issues of *Business Week* advertisements. Technology, as a "selling value," clearly figures prominently in the 1990 advertisements of *Business Week,* while the 1950 advertisements promote

[1575] April 13, 1990 (p. 113)
[1576] May 14, 1990 (pp. 8-9)
[1577] May 21, 1990 (p. 14B)
[1578] June 11, 1990 (p. 1)
[1579] June 18, 1990 (p. 21)

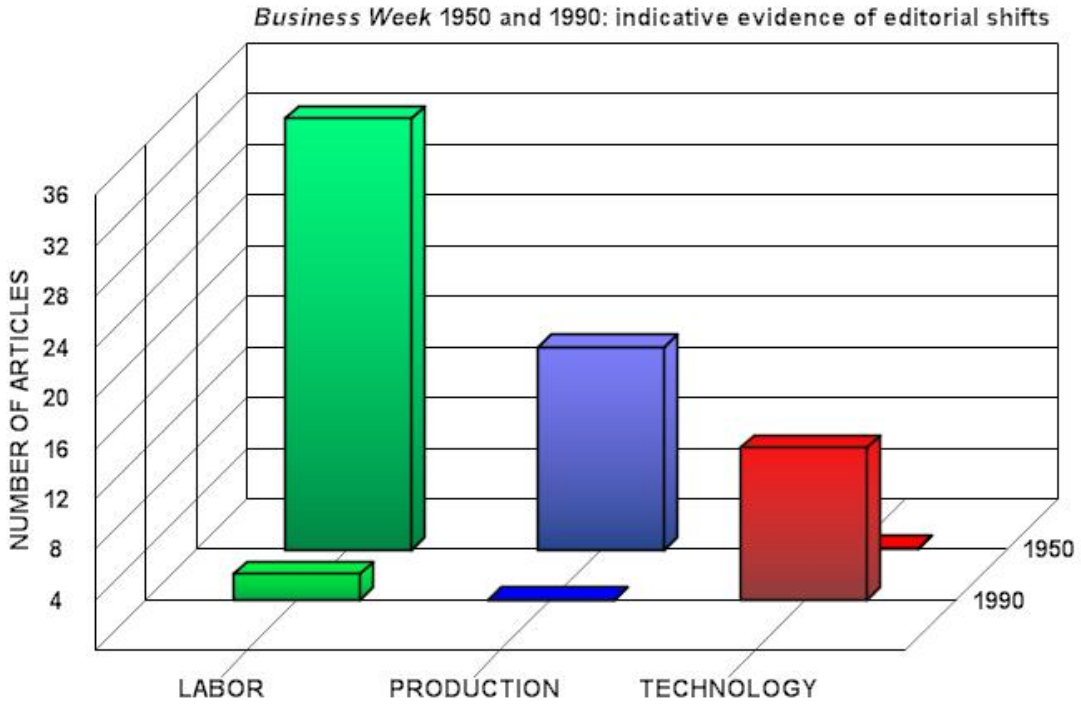
"technology" only insofar as it relates to a production process, generating cost-savings or continual and maximized production. As one example, it is clear from the Rolls Royce advertisements that product quality trumps production speed. It bears noting that a majority of advertisements, here coded as "services," typically feature travel and hotel services. This outcome, no doubt, reflects the readership, not a negligible percentage of which are, no doubt, international business professionals. The fact that the discourse has generally shifted towards "quality" as opposed to "efficiency" lends support to the claim that the new discourse tends to privilege consumer goods ("customer satisfaction") instead of process goods.

Summary charts: comparing 1950 and 1990 editorial and advertisement content

As noted, the focus on labor and production diminished or disappeared in the 1990 editorial content of *Business Week,* compared with what was noted for 1950. By contrast, editorial content centered on technology and science increased dramatically. It is important to clarify that articles in the 1950s may have well amply covered "technology"; however, "technology" at that time was mainly framed in terms of production processes, unlike the 1990s discourse, when "technology" became translatable not only to productivity growth, but also to high-tech-content *products* (as in: consumer end use).[1580] Importantly, the technology count is conservative, because only articles under the "Science and technology" department heading were included. In fact, all counts are conservative, because only articles under specific headings were counted. As such, the graph (figure 11.1) is *indicative,* only. The categories were chosen as central "lenses" through which productivity (and productivity particular) has been conceptualized over time.

Figure 11.1

[1580] For 1950, the first issue of each month from January to June were analyzed; for 1990, the first issue of each month from February to July were analyzed because the first issue in January was a special issue (i.e., not representative of other issues).



Another way to provide a rough overview comparison is simply to note shifts in the department headings. The following chart (figure 11.2) details the headings for 1950,[1581] 1980[1582] and 1990.[1583]

Figure 11.2

[1581] These department heading were taken from the January 7, 1950 issue; the departments remained largely the same over the year (similar to issues in 1980 and 1990).
[1582] Department headings for 1980 were included to help demonstrate a lag in terms of how the scientific and policy discourses spread to the popular discourse. These department headings were taken from the January 14, 1980 issue.
[1583] These department headings were taken from the January 15, 1990 issue.

Business Week department headings

1950	1980	1990
• Business abroad	• Books	• Cover story
• Business outlook	• Corporate strategies	• Top of the news
• Companies	• Economic diary	• Economic analysis
• Finance	• Environment	• Government
• International outlook	• Finance	• International
• Labor	• Housing	• The corporation
• Marketing	• Industrial briefs	• Marketing
• The markets	• Industrial law	• People
• New products	• Information processing	• Entertainment
• Production	• International business	• Finance
• Readers' report	• International outlook	• Legal affairs
• Research	• Letter from Niagara Falls	• Information processing
• The trend	• New products	• Science and technology
• Washington outlook	• Research	• Personal business
	• Resources	• Features

The first point to observe, as noted elsewhere in this section, is the disappearance of "Labor" and "Production" in both the 1980 and 1990 department headings. "Business Abroad" (1950) evolves to "International business" (1980) and then to either "International" on its own, or nothing at all. There are, course, various ways of interpreting these changes. One way would be to consider "Abroad" as more US-referential than "International Business," per se. That is, what is "abroad" is whatever may not be part of the US home turf – it is "other." By contrast, in the 1980s, what is international could arguably include foreign companies now operating in the US. In other words, "international" blurs borders, while "abroad" reifies them. The fact that a department heading specifically linking business to "international" is missing may be interpreted to mean that it is now taken for granted: business *is* international. Does such have implications for productivity? It could be argued that national aggregated productivity measures, as movers

of policy, are less relevant to the discourse, as economic actors are increasingly basing their decisions on international indicators – for one.

A second revealing shift centers on the transformation of "Companies" (1950) to "Corporate Strategies" (1980) and then to "Corporations" (1990). Companies, again, are localized. Corporations may involve international ownership and ownership is largely anonymous. This shift no doubt influences the productivity discourse, again, by making earlier (1950s) productivity measures less relevant: shareholders would be more concerned by quarterly profits, for example, than long-trend productivity measures, per se. Additionally, "companies" are more likely to conjure images of production, while "corporations" may be more readily linked with portfolio management, as well as the general discourse on competitiveness; firms compete, while economist Paul Krugman has suggested that countries do not.[1584] Last, how portfolio management figures into input/output measures adds ambiguity to the productivity discourse, for example.

The inclusion of "Information Processing" and "Science and Technology" tends to affirm the claim that productivity conceptualizations – or whatever produces growth and competitiveness – have moved away from production processes and labor cost to high technology and whatever else can be attributed to the elusive black box of productivity growth. While true that a "Research" heading is present in both the 1950 and 1980 issues here featured, research as a topic does not figure as cover stories (below) for these years. Again, such would plausibly indicate that research had a different meaning and/or importance in those years compared with 1990 – also suggestive of a lag in the popular discourse compared to the policy discourse at that time.

[1584] Krugman's argument is presented in chapter 8.

Cover titles for 1950 and 1990 issues of *Business Week*

Cover titles, because they are selected as the most important story to feature in the weekly, provide still another gauge of how topic coverage may have shifted over time. Cover titles[1585] during the two years under comparison should, theoretically, reflect elements of the social context. As a business weekly, topics – clearly – should reflect issues of greatest interest to the general business community. Would "productivity," as a topic, be featured in a title? It would be realistic to expect that, at the very least, issues related to the conception of productivity during the 1950s, such as production figures and labor issues, would be featured; for the 1990s high-technology and competitiveness would likely be covered. Looking at titles for only one year, of course, does not provide an adequate sampling standard – but issues noted to have shifted in the social context, thereby influencing the way in which productivity is being generally conceived at any one point in time should be reflected in cover stories. To follow are the summary charts for 1950 issues of *Business Week* (figure 11.3) and for 1990 issues (figure 11.4).

[1585] Cover titles for the 1990 issues of *Business Week* were abbreviated as indicated by ellipses.

Figure 11.3

Business Week cover titles - 1950 (January to June)	
S.W. Rolph: He starts off 1950 as the new Exide president (January 7)	CP
Leon S. Keyserling: His economic thinking is also Truman's (January 14)	GD
Capital spending: special report (January 21)	IG
Charles R. Hook: Armco helps expand nation's steelmaking capacity (January 28)	CM
John M. Fox: Finds a new route to America's breakfast table (February 4)	CM
Harry W. Morrison: The sun never sets on Morrison-Knudson construction (February 11)	CM
The New Face of US Industry: Special report to executives (February 25)	IG
Harold W. Sweatt: Thermostats began the trend he rides (March 4)	CP
C.E. Peterson: His enthusiasm sells Californians on S.P. train travel (March 11)	CM
H.C. Turner, Jr.: Banks, buses, atom bombs – all are business to him (March 18)	CM
Louis W. Dawson: He's moved up to chief executive of Mutual Life (March 25)	CP
What's stalling TV? (April 1)	O
Donald Comer: it's easy for an Avondale Mills man to own a home (April 8)	CM
Arthur Keating: his successful Ekco formula will be applied to Nesco (April 15)	CM
H.N. Mallon: his Dresser Industries is on the move again (April 22)	CM
Richard S. Morse: making money in a vacuum is NRC's business (April 29)	TP
Otto A. Seyferth: from Muskegon to Washington to head the US Chamber (May 6)	O
Lynne White: Nickel Plate proves there is still money in railroading (May 13)	CF
Walter A. Stewart: American Optical sharpens the eyes of America (May 20)	CP
William B. Given, Jr.: "Bottom-up management" at American Brake Shoe (May 27)	CM
Industrial production: 1950 pulls out of the 1949 trough (June 3)	IG
John E. Slater: his new American Export liners will set new standards (June 10)	CP
Robert Leeson: Universal Winding gives textile machinery a new stimulus (June 17)	CP
George P. Johns: 50-million credit records stretch US buying power (June 24)	IG

Business Week cover titles - 1950 (July-December)	
George D. Hanby: A new stance for a stand-up chain (July 1)	CM
R.S. Reynolds, Jr.: finance man for Reynolds Metals' financial problem (July 8)	CM
Edward B. Cosgrove: he slipped a green giant under a microscope (July 15)	CM
Stewart E. Lauer: invading a hot market with a new York home cooler (July 22)	CP
Paul W. Litchfield: he expands Goodyear overseas between wars (July 29)	CM
W. Stuart Symington: will NSRB benefit from World War II experience (August 5)	GD
Aircraft production starts the long climb back (August 12)	IG
Robert H. Ammon: Scooters – plus Detroit techniques ... (August 19, 1950)	CP
Hubert E. Howard: Munitions Board Head (August 26)	GD
John D. Biggers: a new glass for his big customer (September 2)	CP
War costs: Treasury has some money to raise nonmilitary spending (September 9)	GD
Georgia Power's McManus: you too can live with government (September 16)	GD
Pan Am's Juan Trippe: flying is transportation, mass transportation (September 23)	CM
James E. Shelton: a retail-minded chief fo the bankers' association (September 30)	O
Paul Hoffman: from public spending for ECA to private spending for peace (October 7)	CM
Charles E. Wilson and Charles E. Wilson: in business together (October 14)	IG
Charles Sawyer: for industry's regulator, some BW questions (October 21)	GD
Unemployment at a two-year low (October 28)	GD
Neil H. McElroy: another P&G product is management men (November 4)	CM
Industrial expansion: The new boom will hit its stride in 1951 (November 11)	IG
Glidden's Joyce: He didn't really need all those reports (November 18)	CM
North American's Kindelberger: He gambled on the fighting men – and won (November 25)	CM
Taylor of Union Oil: to sell oil, sell a company (December 2)	CM
Edgar & Henry J. Kaiser: Pave a road, make a bathtub, build a car (December 9)	CM
Hall of Hallmark: l-million greeting cards a day (December 16)	CM
Canada: in ten years, output nearly tripled (December 23)	IO
James F. Oates of Peoples' Gas: His problem is supply (December 30)	CM

Figure 11.4

Business Week cover titles - 1990 (January to June)	
Industry 1990 outlook: What's ahead for America's 24 key industries (January 8)	IG
The best and worst deals of the 1980s: What we learned form all those mergers ...(January 15)	FP
Trade Warrior: Carla Hills ... negotiate trade policy with Japan and Europe ... (January 22)	IC
The Reichmanns: A ... family that runs one of the world's greatest empires (January 29)	CF
The future of Silicon Valley: Do we need a high-technology industrial policy? (February 5)	TS
The Best Mutual Funds: Getting the most reward for the least risk (February 19)	FP
...Drexel: ... it ... revolutionized corporate finance ... funded many entrepreneurs. (February 26)	CF
... Finance aces ... Wilson..Checchi won Northwest Airlines. Now what? More deals ...(March 5)	CF
King Customer: Forget market share. Stop worrying about your competitors ... (March 12)	IG
American Express: ... James Robinson III had grand plans to build a financial empire (March 19)	CF
Surprise: Some of America's best-run organizations are nonprofits... (March 26)	IG
One Germany: The impact on the world economy (April 2)	IC
Here Comes GM's Saturn: It's more than a car. It's GM's hope for reinventing itself (April 9)	IC
The *Business Week* 1,000: America's most valuable companies (April 13)	FP
Congress: it doesn't work. Let's fix it (April 16)	GD
Japan: can it cope? (April 23)	IC
The genius: Seymour Cray ... struggling to ... revolutionize computer technology (April 30)	TS
Executive Pay: Who made most ... and are they worth it? (May 7)	FP
The Stateless Corporation: ...It does research wherever necessary ... (May 14)	IO
Hot growth companies: Annual ranking of the 100 best small corporations (May 21)	FP
The Genetic Age: Science is ... opening a new era in medicine (May 28)	TS
Software: Networks ... are altering the way businesses work ...The new Lotus strategy (June 4)	TP
Mutual Funds: Winning back the small investor (June 11)	FP
Innovation: The global race: Europe and Japan take on the US ...(June 15) *Special bonus issue*	IC
Class Reunion: The Harvard Business school class of 1970 was different to begin with (June 18)	O
Special mid-year outlook: Where to invest: ... the hottest foreign markets ... (June 25)	FP

Business Week cover titles - 1990 (July to December)	
Who Pays for Peace? A shrinking budget will benefit America ... (July 2)	GD
Tax Fight: What kind of new taxes? How big? Who pays? (July 9)	GD
Banks: Is big trouble brewing? (July 16)	CF
Airwave wars: ... how do we make room for all those new technologies? (July 23)	TP
Mr. Luxury: Name a glamorous product and Bernard Arnault ... Can he manage it all? (July 30)	CF
The Best Companies for Women: How to make your company woman-friendly (August 6)	IG
Are We in Recession? (August 13)	GD
Oil War: Bush leads the world against Iraq (August 20)	O
The Vise Tightens: Pressure mounts against Iraq (August 27)	O
Flash Point: With Iraq holding westerner's hostage, the Mideast crisis escalates (September 3)	O
Home Computers: Will they sell this time? (September 10)	TP
The Fourth Network: How Barry Diller built Fox TV into a contender (September 17)	CF
Mighty Mitsubishi: Japan... bringing the unique keiretsu system to America (September 24)	IC
Soviet Economic Reform: Does it stand a chance? (October 1)	IO
Agony at Chase: Can ... CEO ... Labrecque keep Chase Manhattan independent? (October 8)	CF
Bonus issue: The Corporate Elite: Chief executives of the Business Week 1,000 (October 19)	FP
Auto Quality: ...as Detroit is catching up, the very concept of quality is changing. (October 22)	IC
New Ranking: The best B-schools: Harvard, Chicago, Wharton ... (October 29)	O
The Future of Wall Street: Is Wall Street becoming irrelevant? ... (November 5)	FP
Mexico: A new economic era: A rush to free trade will reshuffle jobs ... (November 12)	IC
Losing Ground: GOP losses in Congress, statehouse setbacks... (November 19)	GD
Rethinking the Computer: How those mainframes on a chip are changing ... (November 26)	TP
How Hartmut Esslinger is shaking up the world of industrial design (December 3)	CM
Farewell Fast Track: Motivating people in difficult times (December 10)	IG
... Foreign competition is fundamentally changing America's role ... (December 17)	IC
The New Face of Recession: ... White collar jobs are already being hit hard (December 24)	GD
Where to invest in 1991 (December 31, 1990/January 7, 1991))	FP

The coding presented is intended to capture the larger themes and help orient a comparison between the two years. Clearly, cover titles can cover combinations of these codes – a selection was made on what was discerned to be the central issue. The supposition being made is that cover titles would, in some sense, reflect a shifting social context, that contributes to the way in which social meaning is attached to the concept of productivity. The coding is as follows:

CF = Company/financial strategy

CM = Company/management and organization strategy

CP = Company/production process and general profile

FP = Financial themes/rankings, general financial strategies and services

GD = General economic themes/domestic

IC = International/competition (including technology and trade)

IG = industry/ general outlook and strategies

IO = International/opportunity (countries as potential places of business)

O = Other (including world events, such as war with Iraq and college rankings)

TS = Technology and innovation/as a science theme

TP = Technology and innovation/as a product development theme

The raw counts are as follows:

1950 titles: CM (22); CP (9); GD (7); IG (7); O (3); CF (1); IO (1); TP (1)

1990 titles: FP (10); IC (9); CF (8); GD (6); IG (5); O (5); TP (4); TS (3); IO (2); CM (1)

These results are summarized by grouping related categories together to create broad comparisons (figure 11.5):

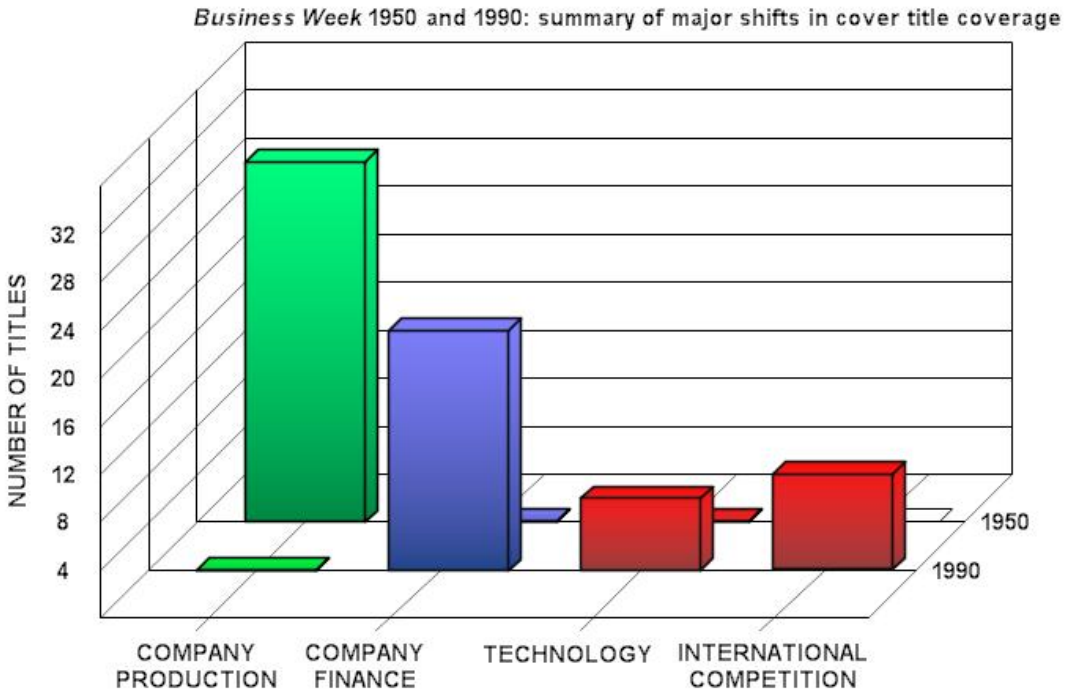
Company production = CM + CP

Company finance = CF + FP

Technology = TP + TS

International competition = IC

Figure 11.5



Interestingly, the major shift – from 1950 to 1990 issues – would appear to be from production to finance, at least per the coding system here adopted. Finance does not figure so much into the scholarly discourse on productivity as a "probable cause" of productivity growth, of course. But, scholars do address the growing portion of services in the economy and its effect on productivity measures.[1586] More importantly, the focus on finance would seem, intuitively, to link with the discourse on competitiveness: deal-making, mergers and acquisitions correspond with new economic indicators linked with competitiveness, such as market shares, sales and profits. It has been argued in this dissertation that during the 1980s and 1990s, the productivity discourse became conflated with a newly emerging discourse on competitiveness. The fact that finance figures so centrally in the 1990 cover issues of *Business Week* would tend to support the notion that the competitiveness discourse did, indeed, morph the discourse on productivity, privileging new indicators and company goals. Competitiveness becomes important to the US when its world leadership is slipping, as

[1586] See chapter 8.

evidenced by the intense coverage of Japan – similar to France's fixation on the United States during the early postwar years.

Finally, a summary comparison of advertisement content provides yet another source of evidence for the shifts claimed to have taken place between 1950 and 1990. As noted, categories were named according to main "selling" messages revealed in the advertisements for both 1950 and 1990. These categories – "Technology," "Quality," "Productivity," and "Competitiveness," in turn, were subdivided into three categories to capture the extent to which the focus fell on products and services or on process. The major shift identified in this study regarding the way in which productivity is conceptualized is that from production process to end product (services, inclusive). The fact that production inputs were not featured in the 1990 issues of *Business Week* necessitated a surrogate measure: IT was chosen, as it sometimes was pitched as an office input – the advertisement message most parallel to that found (overwhelmingly) in the 1950 advertisements. In this case, then, because IT is split between production input and consumer product, the tally for 1990 "process" advertisements errors on the generous side – precisely what we would want if we want to show, with the strongest evidence available, that a shift occurred.

The summary charts (figure 11.6 and figure 11.7) are as follows:

Figure 11.6

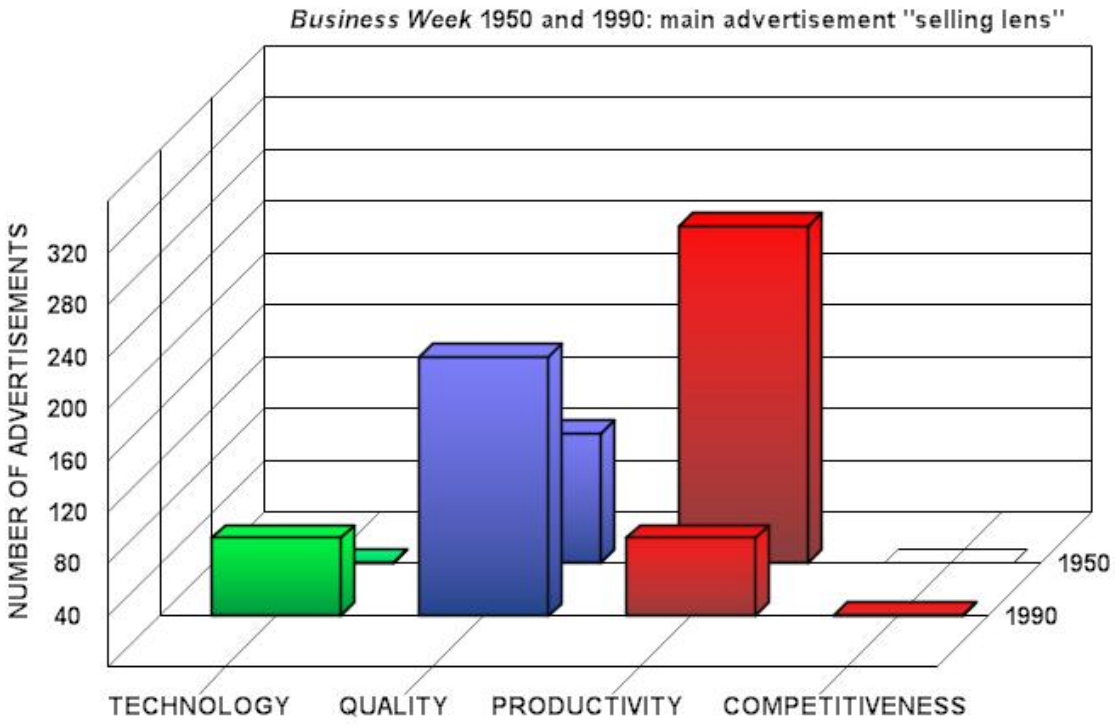
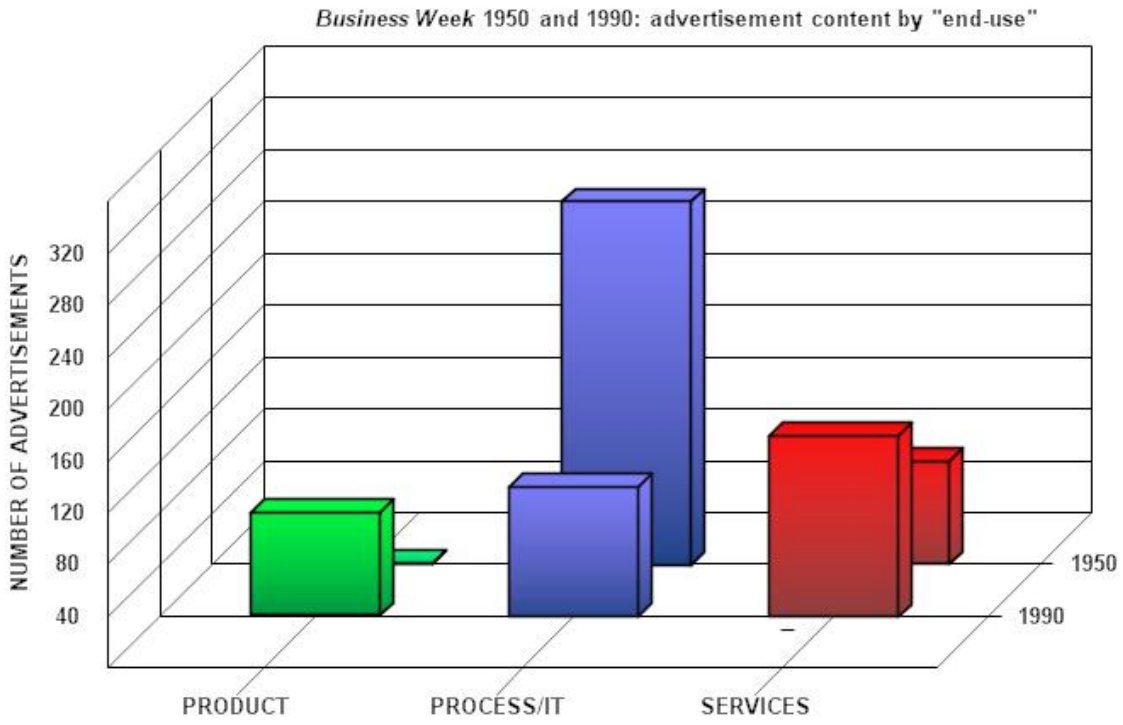

Business Week 1950 and 1990: main advertisement "selling lens"
NUMBER OF ADVERTISEMENTS
320
280
240
200
160
120
80
40
1950
1990
TECHNOLOGY
QUALITY
PRODUCTIVITY
COMPETITIVENESS

Figure 11.7



The overview charts indicate that major shifts in the "selling lens" occurred within the categories of "productivity" and "quality," which squares with claims made in this study. Advertisements attributed to the category "productivity," either used the raw, literal word, or alluded to postwar associations, such as labor-cost savings and efficient. "Quality," by contrast more typically referred to an attribute that would satisfy the consumer – a new aspect of the productivity discourse that began to take root during the prosperous late 1950s and 1960s. As the types of products evolved, from manufactured goods to goods with "knowledge invested" in them, or more intellectual products *and services,* quality continued to count in productivity measures as evidenced by the intensifying concern with hedonic indexing and prices indices able to handle new products, for example. This "indicative" trend is further supported in the second chart, revealing the most noteworthy shift to have taken place between the process and product categories. It is

curious to note that even a product as seemingly end-use oriented as letterhead is in the March 4, 1950 issue of *Business Week* is advertised as an input to office production.

Concluding comments on the popular discourse

This section on the popular discourse aimed to discern patterns and shifts in the editorial and advertisement content of *Business Week* during two historical junctures: 1950 and 1990. The analysis conducted was not a strictly defined content analysis, based on standard statistical assumptions regarding frequency distributions and the like; this method may be of research interest for a further exploration of the extent to which language shifted; it is not clear what numbers, without interpretation, might add to the analysis. Rather than such a method, a more conceptual and abbreviated approach was chosen because the context of the language used was deemed important to the final analysis,[1587] as was the interpretation of the language used and the meanings attached to them.[1588] Counts are important only insofar as they indicate trends and patterns and help provide a visual overview of the results documented – evident break points, not statistical proof of a switch.

Because this approach was chosen, results needed to be triangulated from various sources in order to help substantiate claims being made. It is for this reason that comparisons were made between editorial and advertisement content (divided and subdivided in different ways). Special issue topics of relevance to the productivity discourse, as well as cover articles, were analyzed to determine whether all results roughly squared, lending some robustness to the overall conclusions reached. Additional tools, such as the timing (date) of the content viewed, were enlisted to further support arguments made.

Because *Business Week* provides a fairly uniform database from which to compare two different time periods, substantiation of claims is facilitated. Legislation, by contrast, is more difficult to compare directly

[1587] For example, when it wasn't clear whether the article title was focused on production processes or management strategy, the dominant message had to be discerned. In addition, some titles were ambiguous in meaning and implication; dominant meaning had to be interpreted.
[1588] For example, occasionally, advertisements would make a pitch both for quality and efficiency: a judgment had to be made as to whether one message or the other dominated the ad (depending on *what* was being advertised, for example).

as are scholarly articles because the type of legislation may differ, for one, as might publishers, for another; less can be controlled for. Moreover, the popular discourse appears to follow the scientific and policy discourses as outcomes. As such, the *Business Week* analysis presented provides added confirmation for claims made regarding the legitimizing scientific discourse and the "organizing" policy discourse.

Chapter 12: Conclusion

I have never been impressed by the argument that, as complete objectivity is impossible in these matters … one might as well let one's sentiments loose. As Robert Solow has remarked, that is like saying that as a perfectly aseptic environment is impossible, one might as well conduct surgery in a sewer.

Clifford Geertz[1589]

In defense of the dissertation topic

At one level, these words, so simply, aptly and pointedly delivered, call into question the very sense of this dissertation: productivity is an imperfect, but useful, indicator of a limited concept – why bother? In fact, each of the three economists formally interviewed for this study – Robert Solow, Robert Lipsey and Erik Brynjolfsson – not to mention the many others I engaged in causal conversations as I tried to explain the content of my dissertation, would at some point in the discussion typically shrug: we have created models to measure productivity, defined as output per input invested, using market value measures of goods and services produced – the data available. So, what? Robert Solow, in fact, captured this sentiment most bluntly when questioned whether ambiguities in the way we conceptualize productivity might produce unintended effects, given the importance such measures have as guides for economic organization, broadly speaking:

If I quote a number for the productivity of labor … for the US, the Dominican Republic, or France, for a certain day, everyone knows, or should know, exactly how that number is manufactured and where it comes from and, if possible, to say that it may be an inappropriate way of doing it – it is a measure of output divided by a measure of input: output which weights different commodities by their prices, market prices. Do I think that's a terrible way to do it? Of course that's a terrible way to do it. You should weight them by some other virtue that they have. You can argue about that, but there is nothing ambiguous about that.[1590]

[1589] Clifford Geertz, "Thick description: toward an interpretive theory of culture," in Robert M. Emerson (2001), ed., *Contemporary Field Research,* Long Grove, IL: Waveland Press Inc., pp. 55-75

[1590] This statement was taken from an interview I conducted with Robert Solow on March 10, 2011. Robert Solow won the Nobel Prize in Economics in 1987 for his work on the exogenous growth model, and was, until January 2011 Professor Emeritus at MIT's Department of Economics, with which he had long been affiliated. He is President of the Cournot Centre for Economic Studies, which he co-founded in 2000.

The statement is inviting and provides an opening to defend the dissertation topic. Once defined, the measure of productivity may not be ambiguous, but, as Solow himself suggests, the story need not end there. We might, for example, ask the question why this particular definition of productivity came to be accepted and whether this definition produced policy effects that could have been different with another definition at hand. We might also ask whether the way in which we conceptualize outputs and inputs, as well as the generation of the surplus, shift over time and whether meanings attributed are due to essentialist properties, or if they are contingent to a particular social context. Do numbers obscure the ambiguity in meanings, lending them the hard currency needed to purchase policy? The question lying at the center of this dissertation is not whether productivity statistics should be disregarded because they only imperfectly capture reality. The question is: what is their contribution to the reality we see?

Even if we concede that consumer valuation may not be the most appropriate measure of an output's worth, and we cannot fathom a more straightforward proxy for "true value," another question comes to mind: how were consumer preferences formed? Are preferences exogenously determined, or do they shift in line with changes in the social context? If preferences are endogenous to the economic system, we might think differently about what consumer valuation reflects: not a given, but a construction. Such a distinction may or may not make a difference to economists. When, for example, asked whether consumers may make "unproductive" choices, Robert Lipsey responded: [1591]

> Kuznets[1592] worked on this. This has always been an issue, but there is no accounting for tastes, and there is nothing you can do about it. You accept it and go on – you don't try to go beyond what the consumer thinks. That's a mismeasurement. You might not agree with this approach – well, then, show me an alternative.

Economists work with abstractions of a complex reality by developing mathematical models to isolate hypothesized explanatory factors – ontologically speaking, such is beautifully exemplary of the analyticist

[1591] This statement was taken from an interview I conducted with Robert E. Lipsey on July 19, 2010. Robert Lipsey was head of the NBER Office in New York and Economics Professor Emeritus of Queens College and the Graduate Center, CUNY. Professor Lipsey was long a contributor to the economics literature on productivity and its measurement. Robert Lipsey died in 2011.
[1592] The reference is to Simon Kuznets 1901-1985, who won the Noble Prize in Economic Sciences in 1971 for his insights and work on economic growth.

tradition.[1593] The analyticist research tradition is also characterized by its privileging of what is "useful." Using market valuation in weighted productivity measures is a pragmatic and *useful* approach, as alluded by Lipsey. This dissertation does not challenge these fundamental blocks of model building used by economists to simplify their analyses. Instead, this dissertation explores how those weighted measures come to be interpreted and how they are assumed to reflect law-like patterns of behavior – if not by economists, who know the assumptions they make when formulating parsimonious models, then by policymakers, political elites and the population at large. As Solow responded to the observation that productivity is often linked to the concept of a higher standard of living: "Yes, I think that's true, and it's deplorable."[1594]

Productivity components: from abstraction to essentialist properties

This last statement – quip – begs yet another question: if this indicator is taken, whether rightly or wrongly, as a measure of societal well-being, then how do we define its components? The influential work of Griliches and Jorgenson,[1595] as discussed in chapter 4, exposes the ambiguity embedded in such a question, whereby the two economists very nearly parsed away total factor productivity in their efforts to more accurately include all inputs that conceivably contribute to the output measured. Solow remarked on this effort, effectively discounting serious implications for productivity indicators:

> My response to the Griliches and Jorgenson debate was … "Yes, what else is new?" In the sense, of course, that you can trace productivity increases back to something else, and then trace that back another step, and it's of great intellectual interest to go back as far as you can, but … I don't see any reason to be paralyzed or near-paralyzed about the use of things like productivity statistics by virtue of the fact that there is something underlying them. Of course, there is something underlying them and productivity change, especially in the form of technological change, doesn't come out of thin air, it comes out of other activities of human beings, so what? … If we were really superior intellects, we would be able to trace everything down to the fundamental laws of physics … But, what should it matter to an economist or a government official or the executive of a firm that the ultimate sources of productivity lie deeper?[1596]

[1593] See chapter 3 on theory and method for a discussion of this research tradition.
[1594] Interview, March 10, 2011
[1595] Jorgenson and Griliches (July 1967)
[1596] Interview, March 10, 2011

If sources of the productivity surplus, or residual, do lie deeper than what is commonly assumed to be the case, then there might be implications for policy, for one. If what lies deeper than technology are givens and reflect immutable laws of physics, then of course, it does not matter. And, in fact, Solow is careful to mention that, "… it is important to … differentiate between the operational meaning of the concept and the kinds of questions that Jorgenson and Griliches were raising … What they were after was really not so much a policy question, but a purely intellectual question."[1597]

The work of Griliches and Jorgenson questions the definitions chosen and demonstrate that outcomes can vary, by simply altering the accounting principles involved. Such does not discredit the research effort to develop productivity indicators and attempt to account for the residual in the most humanely accurate way thinkable. Rather, such exposes the extent to which simplifying assumptions can obscure what the outcome represents – an intellectually aesthetic challenge to be taken up by academic economists, for sure, but also a potent tool-in-hand for policymakers and political elites, who aim to move legislation forward. The question that matters is: do these indicators, as constructed, provide the appropriate alerts to take action when economies are in decline or in need of securing prosperity, however defined, for the future?

In his interview, Lipsey spoke to definitional ambiguity in a slightly different way by suggesting, "The idea of output and what proportions of output you attribute to inputs is not that clean of a concept."[1598] In response to a written comment he made years earlier in an NBER review article that aggregate production functions are "fictions,"[1599] he responded that "There is no such thing as 'input' – it's a conglomerate of very different kinds of things. That's why I call them fictions: output is 'everything' – you can't define categories that are unobservable; in the aggregate production function, you are moving away from observables to concepts."[1600] For Lipsey, the aggregate production function, "… is a kind of artificial

[1597] Interview, March 10, 2011
[1598] Interview, July 19, 2010
[1599] Berndt and Triplett (1990).
[1600] Interview, July 19, 2010

concept, but it's useful … it helps you to begin thinking about things."[1601] As does Solow, Lipsey carefully circumscribes the uses for which these models apply: as a way to order thoughts and ideas, to provide the basis for discussion.

This dissertation is predicated on the claim that "productivity" as an economic concept may be limited, but as a political concept, it is powerful by virtue of its politically neutralizing promise that more can be produced with fewer resources, delivering a higher standard of living for all – as though the path to outcome were clear. In a question about what we really know concerning the source of productivity residuals and whether different theories on the table can be reconciled, Lipsey answered:

> I think it's more a question of redefinition than of different theories. As was pretty clear in the original exchange with Denison,[1602] there is an awful lot we don't know about the crucial decline in capital over time. I don't see any great gains in our ability to measure what is always going to be a hazy area – we chip away at the problem. But does it matter? It is a philosophical question. I think we can learn to live better. And, productivity's role in achieving that goal really relates to what goes on in the minds of people… Is it productivity to make all kinds of goods that we couldn't have before, or hadn't thought of before?
>
> New goods presumably add to output. I'm not sure it matters if we think of that as productivity…We are interested in a limited idea – how well people live – and it's already a tough question, which we haven't really settled. What is the effect on welfare by importing goods we couldn't have before, or importing fruits during winter, where, previously, we could only have them during summer? The more you work on these issues, the greater the subtleties that emerge. So, you have an idea that there is some measure of output – deciding how much of that is productivity and how much is input is a futile exercise. It's interesting, but it doesn't have an end.[1603]

Lipsey illustrated the difficulty of separating changes in productivity – shifts in the production curve – from improvements in inputs by discussing outcomes in medicine:

> For some diseases, we witness great improvements in outcomes, but from what do they derive? Are hospitals much better than they used to

[1601] Interview, July 19, 2010
[1602] Lipsey is here referring to a protracted debate that followed the publication of Jorgenson and Griliches' work. Edward F. Denison leveled strong criticisms against the capital measurements used in the work, and these criticisms are discussed by Griliches in Berndt and Triplett (1990).
[1603] Interview, July 19, 2010

> be, or have new drugs been developed? Or, is it a combination of physicians being better trained so that they understand which drugs have to be used? Or, has there been an improvement in the availability of new drugs? It's hard to break it all down, but we can think about it.[1604]

These responses expose a gulf between the contextualized thinking of an economist and the raw, unambiguously defined figure; numbers cannot speak or reason. Numbers can be compared, nothing more. It is this latter trait that renders productivity figures questionable as measures of social wellbeing, simply because the discourse is limited by the definitions chosen. If we were to accept the claim that doing "honest" input arithmetic trapped us in a laborious exercise of infinite regress, the discourse might shift to: what can we produce, at what opportunity cost? A discourse starting from this point would arguably be quite different from one that suggests there are no opportunity costs at all.

This counterfactual does not involve a normative judgment; it does not imply that there are "better" ways to measure economic decline or prosperity and devise plans of action, accordingly – only that there might be "other" ways to do so. When Lipsey suggests that whatever is meant by productivity is related to reflections in the minds of people,[1605] he effectively opens the discourse for interpretation. Why, then, do we typically attach essentialist properties to the concept?

Solow, like Lipsey, resigns himself to accept consumer choices and the way in which consumer value is weighted: by market prices – a pragmatic solution to a difficult problem. Solow also commented that these issues have long weighed on the minds of economists and points out that such was, no doubt, a concern of Simon Kuznets, who wrote about the concept of national income in 1938, for example. Elaborating, Solow remarked:

> It is certainly true that once a decision is set 75 years in the past, no one thinks of an alternative, but I'll bet you that most elementary economics texts today in the chapter on national income will remind the freshman or sophomore taking the course that it doesn't mean that goods are weighted by value according to some higher standard:

[1604] Interview, July 19, 2010
[1605] See quote on p. 438.

> cigarettes count for in the GDP whatever they count for, although you and I know that they shorten lives, but this is not what it's about … it may be interesting to review economics textbooks over time to see whether this warning about pricing is more prominent in the early editions.[1606]

This statement, on one level, again reflects the thinking, also conveyed by Lipsey, that consumer tastes are what they are; the science of economics does not issue judgments on them, beyond market valuations. But more than this, the statement reveals the simple mechanism through which abstracted concepts, or simplified concepts, can become reinterpreted as essentialist concepts: through their usage over time.

In a slightly different way, and perhaps even more compellingly, the way in which the Cobb-Douglas (CD) production function has exhibited staying power over the course of a rapidly transforming world economy would be puzzling, were it not for a simple explanatory mechanism. When asked about the production function, Solow responded:

> It turns out that Charles Cobb and Paul Douglas wrote a paper 85 years ago, roughly, and they produced this particular way of describing this relationship between inputs and outputs, which we now call the Cobb Douglas function, and it has one spectacular aspect, characteristic, which carried the day for them. That is, if production were in some sense describable in a Cobb-Douglas way, then it would follow that in an approximately competitive market economy, the fraction of total output that the market imputed to each of the factors of production would be a constant over time. And the data they had available then suggested that that was in fact the way you would describe the shares of wage income and property income in the US over a period of history going back 50-60 years …
>
> … Also, as it turns out, the Cobb-Douglas function is extremely convenient mathematically, and I think that characteristic endeared it … to generation after generation of economists, and so people now get into the habit of using, wanting to write down a model, and so they write it down in Cobb-Douglas terms, not really because that's the way it has always been done, but because they know from past experience that it will come out nice and simple and easy, and give lovely results that you can inscribe on your fingernail and all that. And, I think I have campaigned to no avail over the years that it has a bad effect in the sense that all those generations of economists have come to believe things about the world, which are really things about the Cobb-Douglas function, and that is where the representation of the world through Cobb-Douglas is really not that good. It leads them astray. So, if the

[1606] Interview, March 10, 2011

> subtext of what you are thinking about is, "Does it do more harm than good?" Then, I would say, "Yes, I think it does more harm than good." But you could argue it's a toss up. It does some good; it enables people to solve problems that they otherwise wouldn't be able to solve and maybe, just maybe, the particular aspect or solution that they're interested in is part of the problem and not just part of the Cobb-Douglas answer to it. But, instead of just history, I think it is convenience. If someone could invent – and that's hard to imagine – a form of production function that was even more convenient than Cobb-Douglas, it would displace it, despite the history.[1607]

In this case, it is not the passage of time and usage that secures the staying power of a concept, but convenience – mathematical convenience. And again, although Solow makes a rough assessment of whether or not such a principle by which a function continues to play a key role in economic modeling, for the purposes of the analysis for this research, no normative statement is being made. Solow's comments suggest that the Cobb-Douglass function is not grounded in any essentialist truth, per se, at least not at this particular historical juncture. But, economic models are abstractions, of course. It is therefore pointless to attempt and test them as "truth-in-reality." Whether or not the abstractions are useful is a debatable question, as indicated by Solow's response. But what is more relevant to this dissertation research is the notion that abstractions, whether because of historical usage or ease-of-use properties, become associated with essentialist truths, at least among those who are less well informed and keen to appropriate the convenience as truth, writ large.

In fact, this claim was more or less agreed upon by Solow, who offered, "… it is useful to point out that if what you keep measuring and reporting quarterly in newspapers and elsewhere is real GDP deflated, using market prices, per hour of work, citizens, readers of the newspapers, will begin to attach a lot of importance to that number, including significances that it probably doesn't have."[1608] But, in step with the quote that begins this chapter, Solow does not perceive any of these shortcomings – the simplified assumptions or the way in which the public then attaches meaning to the numbers produced – as a justification for abandoning

[1607] Interview, March 10, 2011
[1608] Interview, March 10, 2011

the project. The idea, rather, is to improve the project. In characteristically eloquent fashion, Solow uses the ordinary example of baseball and the evolution of measures to assess their skills:[1609]

> For a long time, for most of my life, baseball players were judged by their batting average. The batting average is arrived at by dividing the" number of hits" by the "number at bats." The "number at bats" is defined in an unambiguous way. And it came to be in exactly the same way we are talking about – that everyone or nearly everyone came to just take it for granted that that was the valid measure of a ball players talent and contribution to the team. But, especially once we got computers, and it became easier to collect more raw data, scholars of baseball had thoughts well, you know, maybe we can improve on the batting average as a standard, and so they started to say that the number of hits a batter gets counts as a single, but a double and a home run might be weighted so that the total number of bases divided by bats becomes a better measure. But others will say … and, from an economist's point of view, such could be worthy of a discourse scholar's attention … what you should really be interested in is what a player's contribution to his team actually is, and so, they are beginning, using an intellectual apparatus, which is not unrelated to a production function, to try and answer questions like, "How many runs per nine innings the team plays, do the different players contribute?" and "If his team has won 89 games during the season, how much could you attribute to the different players?"
>
> We can do the same thing with GDP, some of which has been tried out. There have been attempts to calculate green GDP, which subtracts various environmental disamenities, there have been attempts to include leisure, attempts to count commuting as a minus rather than a plus in the GDP. So there are always attempts to improve the number, and they are always hard.

This response, in a sense, conveys an ontological assumption about the world, that differs from that made at the outset of this particular research – which, clearly, has no bearing on the rightness or wrongness of the analysis offered, because ontological assumptions reflect belief systems about the world – wagers regarding how we produce knowledge, or from what conceptual basis can knowledge be produced.[1610] In this interview, Solow not infrequently makes references to the laws of physics, [1611] suggesting – maybe – that economics is governed by properties, knowable at some level, and that an economic concept, such as

[1609] Interview, March 10, 2011
[1610] Ontological assumptions about knowledge production are discussed in chapter 3.
[1611] For example, see quote on p. 436.

productivity, may have an ultimate source that we can approach ever more closely as we continue to invest our efforts in the mission at hand.

Is productivity a natural social value? Or, more precisely, is there an objective way to measure progress? An unsourced quote from the writer Franz Kafka defines productivity as, "… being able to do things you were never able to do before." In reference to this quote, Solow remarked, "I think that's too broad for an obvious elementary reason: it's not measurable."[1612] At another level, Solow suggested that Kafka's concept of productivity is too subjective: "If I drive a car, and I measure how much distance I cover, Kafka could say, 'Oh, well, that's the wrong thing to measure – instead you need to determine how much pleasure you got out of the drive, or whether you enjoyed looking at the countryside?' And I would answer, 'Yes, I got pleasure out of it, but it's not the same as the distance I traveled.'"[1613]

Solow is careful, always, to separate the issues that are often conflated and circumscribe the objective of measuring productivity, defined as output per input invested. But, if we were interested (and not everyone is) in whether or not productivity is an essentialist concept, we would have to ask different questions. First, we would want to know if meanings attached to productivity really are stable over time, or if they shift in some relation to the social context, or more pointedly, accidentally and contingently. If the latter, we might then be interested if the definitions, as accepted, produce particular effects. If yes, then we could assume that *meaning* produces outcome, not a patterned law of physics, per se. But, to carry the analysis further, we would need to pose a counterfactual: would the world have looked differently today, had we accepted another conception of productivity? We might consider that articulated by Franz Kafka or, even, the definition proposed by the French architect in Amiens discussed in chapter 6, whereby the use of efficiency as a baseline to judge the "productivity" of a building design was queried, as opposed to whether or not the inhabitants would "live well" in such a building. The latter, of course, requires a completely different set of parameters by which to assess "success."

[1612] Interview, March 10, 2011
[1613] Interview, March 10, 2011

The outcome of such a counterfactual, like all counterfactuals, cannot be definitively described. But, we can attempt to reason through them. We could, for example, take "inventions" as a proxy for the outcome envisioned by Kafka. In this case, and not altogether differently from how "productivity" is fundamentally conceptualized, innovation would, at another level, be a proxy for "progress." It could be argued that productivity, as traditionally conceptualized, implicitly measures the same outcome, or attempts to. But, the real question for a political scientist to answer, and not necessarily an economist, is: if the indicator we are looking at focuses on – to take one example – on education, however proxied, rather than output per input invested, with items weighted at market prices, would the "alerts of decline" have occurred at different historical junctures, rather than, for example, the distress signals issued in the late 1970s, and would the policy measures adopted differ from those that were enacted on the basis of traditional productivity measures? To take another example, if productivity were defined as leisure time per work hours invested, the rankings of countries would have certainly differed, with the US scoring low in terms of "progress."

In fact, the research presented does not support any conjecture for how the world would have looked had we defined productivity differently than output per input invested, however configured. But the dissertation does demonstrate that the outcome *could* have been different; there is nothing inevitable about the way in which productivity indicators are constructed, or the fact that productivity came to be valued as "progress."[1614] Even the raw definition of output per input invested lent itself to various interpretations throughout the 20th century, from Taylorism to post-Fordism. Why then could we not imagine social value being attached to the "possibility of doing things we could not before," and measured in terms of education level, as a heuristic exercise?[1615] Any proxy adopted, of course, for this measure would be flawed and limited – as the measures for productivity are. But from this different starting point, we might imagine another kind of society developing, with the numbers doing their work for the promotion of this particular

[1614] Max Weber alludes to this when he writes, "Whenever modern capitalism has begun its work of increasing the productivity of human labour by increasing its intensity, it has encountered the immensely stubborn resistance of this leading trait of pre-capitalistic labour," in Max Weber (1992), p. 24. This point is discussed in the introduction.
[1615] Curiously, in a recent CNN online article, education is now the key to US national security and world competitiveness, according to former Secretary of State Condoleezza Rice and CEO of the Education Division at News Corp, Joel Klein. See http://globalpublicsquare.blogs.cnn.com/2012/03/20/rice-klein-education-keeps-america-safe/

social value, in the same way that numbers have done their work for productivity, as defined – imperfectly, but with effects.

Robert Solow does not outright buy the claim that meanings attached to the concept of productivity have shifted over time, at least among the experts dealing with the concepts:[1616]

> I doubt meanings of productivity shift over time. I say that without any confidence. I guess, in a way … the key word in your question is "we." When I think of "we" I am thinking of me and my buddies … and you are talking about a much broader collection of "we," and I don't know the answer to that. But I don't think for people with a professional interest, like me, and other academic economists, including those in business schools, that meanings change; the technician has a grasp, but it may be that it gets lost in diffusion.

At a most basic level, productivity – output per input invested – has been the standard definition over time, among technicians and academics. And, it is possible to interpret changes in the lens through which this ratio was to deliver a surplus for the collective whole as evolutionary, or progressive; as we better understood the factors that were hypothesized to contribute to the residual, we developed more sophisticated models attempting to incorporate these new understandings. We could truncate the analysis simply by suggesting that, true, but the technical definitions got lost in translation when it came to political elites, policymakers and the general population. Such would have the effect of producing contingent outcomes over time, not related to laws of science.

In fact, the claim being made in this dissertation is that first, the definition of productivity – the ratio of output per input invested – as accepted was not inevitable, and second, that once defined, inferences drawn about the ratio shifted. The arithmetic is simple enough; the ratio will increase, either if the denominator declines, or the numerator rises, or both. During the postwar years, at a time, not incidentally, when labor was relatively strong, the political focus was evidently aimed at the denominator; discussions centered on labor cost minimization. Production maximization also figured into the political discourse at this time, not

[1616] Interview, March 10, 2011

through innovation or technology, but through legislative action preventing, for example, collective bargaining agreements on an industry-wide basis.[1617]

This same focus is apparent in the scientific discourse; influential papers focused on the link between wages and productivity, for example.[1618] Scholarly discussions during this time regarding "technology" and to what this concept referred also reveal that productivity was conceived as a production *process* – the way in which goods were manufactured[1619] – not the goods themselves. Nowhere is this focus more apparent than in the popular discourse, where advertisements and editorial content of the weekly *Business Week* during the immediate postwar years covered production processes and cost efficiencies. The research conducted for this dissertation shows the popular discourse to *follow* shifts in the scientific and policy discourses.

During the prosperous 1960s, as one example, scholarly works – and particularly those that were influential in policy debates[1620] – labored over issues related to product: how to gauge product quality through the use of hedonic indices; price indices for products, generally became a central point of debate. Price indices, of course, are central to the calculation of productivity, and price and hedonic indices are important, more specifically, for the numerator: output. From an economist's point of view, the response might be: what does this matter, if efforts are continuous and ongoing to improve measurements in both the numerator and denominator? From a policymaker's point of view, a focus on labor cost and its link to productivity would intuitively have different implications for policy – as seen with Taft-Hartley, for example – than a focus on hedonic and price indices, which would presumably drive policy towards, for example, the development of competitive products that satisfied growing consumer wants and needs. Debates surrounding the Wydler-Stevenson Act, for example, are clearly focused on technology *products*, not processes.

[1617] See discussion of, for example, Taft-Hartley in chapter 7.
[1618] Again, the debates surrounding Taft-Hartley, chapter 7, provide the clearest example.
[1619] See discussion of Stern (1933) and Wubig (1939) in chapter 4 for example.
[1620] See, for example, Adelman and Griliches (1961) as well as the coverage of the Stigler Commission (Price Statistics Review Committee), both in chapter 4.

The shifts described are abstracted – in much the same way as the aggregate production function and other economic concepts are abstractions, or simplified representations of reality that serve to order thoughts and ideas. If economists, such as Robert Solow, do not ascribe to the abstractions here made – for any reason, perhaps because the link between their work and policy is not their particular interest – then the analysis can be taken in another direction by asking what element of productivity is invariant over time? The answer might be the surplus, or the residual, disembodied technology, or the shift in the production function –all names for the same elusive principle, which we have named "progress." That the source of progress was viewed through man at the beginning of the century and then, towards the 1980s-1990s, became interpreted as "technology," may not so much represent shifts in social meanings, but progress in the way source of surplus has become known and verified over time. As Robert Lipsey pointed out, "We don't know everything that is in the residual, but we know plenty of it – there is plenty on which to base policy."[1621]

Technical change and the elusive residual

It is difficult to disentangle the accommodation of accounting principles involved in isolating the residual – as the work of Griliches and Jorgenson demonstrated – from what is considered to be its "essence." In his famous 1957 paper, "Technical change and the aggregate production function,"[1622] Solow defines technical change "… as a shorthand expression for *any kind of shift* in the production function."[1623] As such, according to Solow, disparate elements may be included in the residual, including confounding factors such as slowdowns, educational improvements in the labor force and more.[1624] With the assumptions and proxies given and openly conceded, technical change is calculated and noted to be: "… essentially constant in time, exhibiting more or less random fluctuations about a fixed mean."[1625] When asked why this result obtained, Solow responded,[1626]

> There are things in the world that don't change much. The velocity of light is an extreme example … if you measure the velocity of light,

[1621] Interview, July 19, 2010
[1622] Robert Solow (1957), "Technical change and the aggregate production function," *The Review of Economics and Statistics,* 39:3, pp. 312-320. This work is discussed in chapter 4.
[1623] Ibid., p. 312. Emphasis in original text.
[1624] Ibid., p. 312.
[1625] Solow (1957), p. 316
[1626] Interview, March 10, 2011

> what you used to get, but no longer, are very slight errors, deviations from constancy, and you would attribute that to normal errors that your measuring instruments constantly make. Measuring instruments at the BLS are less precise than that. So, I don't expect any constancy, but if it looks as though something seems to have more persistence than pure chance would allow, we can ask, "Why might that be?" That's what motivated Cobb and Douglas to do what they did.

This response reflects a particular worldview, where the principles of economics is grounded by laws of science and patterns that produce inevitable outcomes – perhaps not in an unqualified sense. But, if we were to accept the technical change measure as reflecting underlying patterns and laws, then the question becomes: what are the policy implications for the generation of surplus that is nearly constant over time? As we know, policy initiatives aiming to generate productivity surplus varied greatly during the last century both in the United States and in France. Solow concedes that a break in the data can be observed around 1930; progress is interpreted to have possibly accelerated after 1929.[1627] In fact, breaks in the data (or years when declines in the index measuring technical change are documented)[1628] arguably occur around historical junctures. Solow discussed the way in which history may influence this measure in the following way:[1629]

> When you see some pure productivity number like what we are talking about, going sharply up, you know in your bones that there is probably no sense in assuming that something that it reflects something identifiable as technology recovered – it doesn't smell right – something else is happening. And what is happening is possibly more related to important historical changes, but it doesn't strike me as difficult to accept that the measurement, the calculations that give rise to this number … has some irregularities, and that this is coming about because of some forces that you're not taking into account. Whether they happen to be depressions or wars, I don't know.
>
> It could be that during these times, the least productive workers were employed, and not only the least productive workers, but the least productive equipment; if you operate at half capacity, then probably only the most efficient equipment will be in use. So, there are ways that this could happen. I offered the possibility that it was a statistical artifact, and I might have had in mind that in times of stress, the ordinary statistical measurement might be flawed in one way or another – that was probably a rank alibi, but certainly … you need a long time series, which you now have available compared to 63 years ago … to

[1627] Solow (1957), p. 316
[1628] This observation is discussed in chapter 4.
[1629] Interview, March 10, 2011

> see whether there is more irregularity in moments that you could identify as crises.

Even if we were to run a longer time series and discern that breaks in the data related to historical junctures, times of economic stress and not changes in technology, per se, then the argument that policy has no discernable bearing on statistical outcome would only be stronger still. Or, that policy, instead of attempting to legislate measures intended to accelerate productivity growth, might instead aim to legislate for economic stability – one alternative. Either way, a near-constant measure of technical change, or surplus, provides woefully few clues for legislators wishing to promote productivity, or, in the event that breaks that do occur coincide with historical junctures, then the data suggest a need for change in the cues and policy focus. Solow himself argues that what can be read from the aggregate production function is limited in terms of what we can learn about the "economics of innovation." Solow offered:[1630]

> One of the things I preached about, but never did anything useful about, is that if you want to talk about the economics of innovation, about the evolution of total factor productivity, it would be helpful if that could somehow be brought into a relationship with what historians think of as the history of technology: the invention of the transistor or the jet engine, which are not describable in terms of capital or labor … they are specific phenomenon, and there is no point in trying to learn something about the determination of GDP in terms of jet engines and transistor television sets… But if you are trying to understand the work of Griliches and Jorgenson, and trace innovations back to their source, then you are never going to do that by looking at abstractions like capital and skilled labor, and so on, because that is not the form in which it appears. It appears like a jet engine, or something of that sort.

These words come uncannily close to those found in the unpublished mimeo by Griliches, who later in his career, and in reference to the elusive residual, declared, "Explanation must come from comprehending the historical detail."[1631] The thoughts of these two most influential thinkers in the field of productivity and growth, in some sense, point to the senselessness of using productivity numbers as policy guides, if the goal is to promote innovation. It is hard to fathom how the numbers would get us there. If policymakers were to

[1630] Interview, March 10, 2011
[1631] See full quote on p. 148, chapter 4.

focus on innovation processes, rather than the raw numbers of productivity growth, the policy triggers might be different.[1632]

Is technological progress serendipitous and if yes, how can it be promoted? Solow answered:[1633]

> My answer to that question is "partly yes and partly no" … I know of examples where an industrial research laboratory set out to solve a well-defined problem, which was important to the manufacture of their product – automobiles – and they ended up finding something else, because they didn't solve the problem they set out to solve, but they learned other useful things, some of which were actually useful in the automobile... Now, why is that not a satisfactory answer to the question? This is a rhetorical question.
>
> If you want to promote productivity, you can conclude that the way to improve productivity is to provide incentives for firms to increase their expenditures in research, remembering that some of this will go to waste, dribble out in dead-ends … it will have unintended consequences, and some of it, and it is very difficult to gauge what fraction, will actually pay off in the way you expected it to.

But this general statement still leaves the outcome of productivity statistics open to debate. In reality, if policymakers were to follow the statistics as raw guides – as, in fact was done in both France and the United States during the 20th century – policy could well miss the mark. This argument might not resonant with economists, such as Robert Solow, who, perhaps, would be more inclined to issue a disclaimer about productivity statistics and their intended uses (limited). Still, we can explore the claim further by looking at what came to be one of the largest statistical puzzles of the last century: *the productivity paradox*, following on the oft-cited quip of Robert Solow, " You can see the computer age everywhere but in the productivity statistics."[1634]

The productivity paradox

[1632] Solow, no doubt, would consider this claim inflammatory, at least at some level. In reference to the quote by Griliches and when asked whether neo-classical economics does itself a disservice by bracketing history, he responded, "In some way yes, in some ways no: if I observe something in an economy and want to explain it in simpler terms, that either requires more attention to history in some essential way, or it doesn't – but I don't like to think of it as a general question." Solow also pointed out that asking about historical circumstances in relation to a particular outcome can lead to a kind of infinite regress, as pointed out earlier in this chapter. Interview, March 10, 2011

[1633] Interview, March 10, 2011

[1634] From an article by Robert Solow, "We'd better watch out," for *The New York Times Book Review*, " July 12, 1987, p. 36. The printed comment and its after effects are covered in chapter 4.

When asked, Robert Solow is nearly dismissive of the comment, which he characterizes as a "casual" observation, true at the time he delivered the quip, but resolved 8-10 years later, when productivity growth began to accelerate.[1635] Solow credits the rightful explanation to Oliner and Sichel,[1636] who posited a lag in terms of learning how to use computers to leverage their productivity-enhancing potential. Solow continued:

> To me, the most interesting aspect of what Oliner and Sichel found is that a lot of the acceleration of productivity growth that followed some years after the introduction of the computer came from the production of computers, and only part of it came from the use of computers. And you now have an industry, which is growing rapidly, and in which productivity is rising and costs are falling dramatically. This will show up in the overall productivity statistics, even apart from the fact that the industries that buy the computers and use them have an increasing productivity attributed to them. I don't think the original observation was wrong – it was right at its time. It's like I said it was raining and the next day it is sunny – that wouldn't make my first statement wrong.

The cause of acceleration, at any level, a decade after the implementation of a new technology cannot be definitively linked to the new technology, only inferred. Moreover, given the fact that information technologies can be seen to literally revolutionize work habits – productivity statistics might not just be expected to show signs of acceleration, but to produce veritable breaks in the statistical data. In thinking along these terms, when asked whether or not it might still be raining insofar as the signs of *revolution* were never clearly evident,[1637] Solow remarked:[1638]

> Of course you can't capture that, but who intended to capture that? Productivity numbers are intended to measure output per measure of labor input or another kind of input, where output is distinguishable from life … Let me give you something that is in some ways simpler and more shocking: I think television changed people's lives in ways that would never be captured in productivity statistics. Who could believe that people would sit in their living rooms and watch sit-coms, evening after evening – I would say that this changed their lives for the

[1635] Interview, March 10, 2011
[1636] This work is covered in chapter 4.
[1637] According to Robert M. Collins, (at that time) MIT economist Paul Krugman, "… spoke for the skeptics in doubting that the official statistics were in fact missing a productivity revolution. The promised payoff of a 'silicon revolution' appeared to lie at some point in the future; perhaps it was the nature of such technological revolutions that their full impact lagged behind expectations and predictions, or perhaps the positive contribution of these technologies had been offset by other diseconomies accompanying their adoption." Collins (2000), p. 227.
[1638] Interview, March 10, 2011

> worse, though they don't think so, but I would never expect the deflated gross domestic product to measure that.

The example cited could be criticized in the sense that television does not directly impact work practices, as does IT; however, the point is taken that the numbers are limited in what they show, and it is far beyond the scope of this dissertation to make claims about what a "revolution in productivity" might look like in the statistics. But, the research can stake claims about how scholars assess this revolution, or simply the benefits of IT, and what that might reveal in terms of how the discourse may or may not have shifted as a result of this "paradox. "

The 1980s-1990s discourse

Erik Byrnjolfsson of MIT figures among the prominent scholars working in the field of IT productivity measures, ascribing his interest to Moore's law, whereby the number of transistors that can fit on a chip each year roughly doubles every two years. As he remarked, "The frontier keeps getting further and further away, and some companies are pushing aggressively towards it, and others are not, which is why we see a growing spread over time."[1639] The spread, barely concealed in terms of competitiveness, as well as the focus on firms, declares a shift in the discourse on productivity. The argument being made in this dissertation is that the productivity paradox weakened the case for productivity statistics, particularly at the aggregate level, and provided an opening for business scholars to influence the morphing discourse. Robert Solow does not agree with this claim:[1640]

> My view, and this just comes out of my own life at the university, is that economists have invaded the business schools to a very large extent and many of the people you describe as business scholars are

[1639] From an interview with Erik Brynjolfsson on August 11, 2011. Erik Brynjolfsson is the Schussel Family Professor at the MIT Sloan School of Management and Director of the MIT Center for Digital Business. In this interview, Brynjolfsson drew from an article he co-authored with Andrew McAfee, which defines the spread in terms of competitiveness, or profits and market share (as two performance indicators). Productivity is mentioned only in general terms, with US company productivity growth noted to double around the mid-1990s. See Andrew McAfee and Erik Brynjolfsson (July-August 2008), "Investing in the IT that makes a competitive difference," *Harvard Business Review,* pp. 102 and 100, respectively.
[1640] Interview, March 10, 2011

> more or less conventional economists … business schools grew faster and they hired … the business school of Stanford University has its own economics department, which is of high quality according to the standards of academic economics. The people, who sign their articles from the Stanford business school, are like John Roberts: they write in standard economics journals, and they are recognized by the fraternity as straight economists. At my own university at MIT, the degree of cooperation between the business school and department of economics is greater than at Stanford, so the business school, instead of having its own economics department has been happy to send its students to our department.

But even so, the question that arises is: does this cross-fertilization generate a different discourse on productivity, or a focus on other performance indicators? Solow offered:[1641]

> Managers certainly look at different indicators, and I think this it is certainly true that business schools, including economists employed in business firms are likely to direct their attention beyond normal productivity statistics, but I think they know exactly what they are doing, and they probably produce productivity numbers, but they are more goal directed than your academic economist, who is producing these numbers out of pure curiosity – someone, who is employed in the business school or business firm, is looking at the bottom line.

Brynjolfsson, a business school economist,[1642] makes assessments using indicators, such as revenues, market share and profits, but, indeed, he is keenly interested in productivity, having made numerous contributions to the debate on the productivity paradox:[1643]

> I wrote a paper in 1993 about the productivity paradox in IT, which lists four reasons why we didn't see productivity in the numbers – I mainly concluded that even though we were benefiting from the technology, we weren't measuring it very well. I did a survey asking managers the benefits they expected to get from IT investments, and they listed five: improved quality, timeliness, more product variety, better customer service, and lower labor costs. Of those five, the first four mostly don't get measured.
>
> Quality is half-measured. When a car has anti-lock breaks, that gets measured, but a lot of quality benefits are poorly measured – hedonics try to capture this, and for computer equipment itself, they actually do a pretty good job, for cars, they are somewhere in between, and for other things they aren't so good. We miss a lot of that – increased product

[1641] Interview, March 10, 2011
[1642] Brynjolfsson's PhD is from MIT, in Managerial Economics.
[1643] See chapter 4 for a discussion of Brynjolfsson's work. The statement to follow comes from the August 11, 2011 interview.

> variety is almost entirely missed, as is customer service: they are not included in the statistics. So, a lot of this, the new goods that add a lot of value to the economy don't show up in the productivity statistics very well, and this is an increasingly known bias.

Brynjolfsson, in fact, began exploring a theoretical model for why we were observing a productivity paradox in computers, but later looked for other ways to explain the puzzle. Brynjolfsson describes a conversation he had with the former Chairman and CEO of Citicorp, Walter Wriston, who assured him that banking could not be run without IT, adding, "… if the data don't show benefits from IT, the problem is with the data and not with IT."[1644] Brynjolfsson conveyed that he did go back to the data and found "value" from IT investment not uncovered previously by economists – firm-level data, which he describes to be more "precise," and also remarked:[1645]

> There are many examples, where I have got insides by being in a business school and talking to executives and have used that to change the direction of my research. Sometimes, economists have physics envy. I think one big advantage we have over physicists is that physicists can't interview a proton or an electron, but we can and should talk to people. Too many economists ask the question, "Why did the price go up or down?" Well, you can just go and ask.

The language has shifted, and the link to the productivity paradox is evident – explanation is hard to discern in the aggregate data. For Brynjolfsson, like for Solow, the paradox has been solved, but the explanation differs:[1646]

> Where it concerns leveraging IT productivity, organizational change is nine-tenths of the iceberg. We measure the concrete part well; we don't measure the intangible assets well. We are changing that – Nick Bloom, John Van Reenen and I recently received a National Science Foundation grant to gather information on organizational practice through the Annual Survey of Manufacturers. By December, we should have a lot more information about that, so I think there is a change in that we are persuading people that it is important not to measure only physical capital. This will be measured at the establishment level, so one of the goals will be to determine the extent this is representative for the whole economy.

[1644] Interview, August 11, 2011
[1645] Interview, August 11, 2011
[1646] Interview, August 11, 2011

In fact, Brynjolfsson believes that measurements can go beyond the firm, by looking at individuals and their transactions: "I can get more insight by looking at more detailed types of data."[1647] But, finely detailed data must still be ordered and defined as to the role it plays in "productivity." Brynjolfsson admits that the process might miss relevant intangible inputs, as well as intangible output, for example. Lipsey noted that the measurement of intangibles is problematic.[1648] When asked how intangibles are measured, Byrnjolfsson replied:[1649]

> There's price and quantity. Assets I have in mind are like changes in business practices, managing inventory or running prescriptions[1650] that is an asset in the way running machinery is an asset. That will have some value, using stock market data, or you could look at how many dollars were spent in trying to create the asset. Yes, in my paper,[1651] this is now treated as an expense. So, if you spend money and expect to get benefits from all that expenditure within 12 months, you treat it as an expense; if you expect some of the benefits to materialize after 12 months, you can think of it as an investment in an asset. Part of what I argued is that a lot of the money you spend on personnel to create new business processes is treated as an expense even though part of it is an investment in creating business processes that last many years. We are trying to estimate how much of it is in those different categories; the results will be soon published. Indeed, we find that the total value of intangibles has been growing over time: part of that is that the price went up, especially in the 1990s, prices crashed in the 2000s, but the quantity has continued to grow fairly steadily and the total value is price times quantity – so you see a rise then fall, then rise again, in value. Quantity has grown more steadily.

It is not counter-intuitive that an economist affiliated with a business school would focus his analysis on firms; however, the inclusion of these views in the discourse, over all, does mark an important shift in the way we conceptualize productivity. Not only are firms the subject of study, but also new indicators, as noted, have become integral to the analysis: stock market valuation. But, much like the work of Jorgenson and Griliches, in which new definitions of inputs and outputs used translated into a much reduced residual, Brynjolfsson conceded that missing data are not just intangible outputs, but also intangible inputs. Still he claims that, "If we were in a steady state economy, with a steady amount of intangibles, the amount of new

[1647] Interview, August 11, 2011
[1648] Interview, July 19, 2010
[1649] Interview, August 11, 2011
[1650] Tape response is not clearly audible, but the sense is clear from what follows.
[1651] The work we were discussing was, Erik Brynjolfsson and Lorin M. Hitt (Autumn 2000), "Beyond computation: information technology, organizational transformation and business performance," *The Journal of Economic Perspectives,* 14:4, pp. 23-48

intangibles being created and the amount of value we were getting out of the old intangibles would kind of cancel out."[1652] Brynjolfsson's claim is that computer-related intangibles have grown exponentially, which would have translated into ever-higher productivity growth, had there not been mismeasurement. Still, this answer does not necessarily escape the definitional conundrum of what counts as an input and what counts as an output, or *when* an input becomes an output – similar issues that plagued aggregated figures. Lipsey, in fact, offered a further explanation as to why intangibles complicate the analysis:[1653]

> Measurements are getting harder as, increasingly, capital is intangible, and it's not clear how we should measure that. I am writing a paper about that now. I am worried about measures of output and of trade and of production location – the intangibility of capital complicates the analysis – intangible capital has no clear geographical location.

Does Brynjolfsson, as a business economist, use the word "productivity" in a way that differs from academic economists? He answers, "Yes," in that he adopts the broad definition of getting more output for less input, the ultimate source for our higher standards of living. And, he credits Robert Solow with having correctly argued that increased productivity comes not from working longer hours – some may come from having more capital, with most coming from improvements in technology: "… new ways of combining atoms in different ways."[1654] Productivity, according to Brynjolfsson, can lead to improvements in other indicators of firm performance, such as profitability. He remarks:[1655]

> A company that has higher productivity will have a greater chance of being more profitable. But if all the other companies simultaneously have improvements in productivity, then depending on the competition, these benefits may not show up in profits; they may show up as cheaper prices for consumers… Productivity makes the pie bigger, then depending on the competition, it could go to consumers, something called consumer surplus, or it can go to something we call producer surplus, which is basically profits.

[1652] Interview, August 11, 2011
[1653] Interview, July 19, 2011
[1654] Interview, August 11, 2011. Brynjolfsson notes that this explanation of productivity differs from that argued by Dale Jorgenson, who confers a greater role on capital to attain higher rates of productivity. Indeed, this idea squares with the expert testimony delivered by Jorgenson during congressional debates relating to a national innovation policy. The expert testimony is covered in chapter 10.
[1655] Interview, August 11, 2011

Focusing on profitability and its link to productivity severs the neutralizing force of the original discourse on productivity, which promised a bigger pie for everyone. This issue was explored in the early work of Frederick Mills,[1656] and, as such, *is* part of the scientific discourse, though it tends to be obscured by relating productivity growth to higher living standards, generally. And, it bears remembering that political elites and policymakers have long tapped the disarming element of the productivity discourse to move initiatives forward, conveniently bracketing distributional implications.

Does a business economist view the source of economic growth differently from an academic economist? In response to a question about Dale Jorgenson's assertion that of all three types of capital – human, intellectual and tangible – human capital accounts for the lion's share of economic growth,[1657] Brynjolfsson responded:[1658]

> Human capital definitely accounts for the lion's share of capital, but it hasn't changed very much, so I don't think it accounts for the lion's share of growth. In the US, people are highly educated, but the increase in education hasn't been very large … So, there is not that much in the increase in output that is due to the change in human capital. On the other hand, there has been a huge change in the amount of intangible organizational capital – that has grown much more rapidly.

In this analysis, information technologies, then, have produced the growth in productivity, or improved firm performance, through enhanced organizational practices. But the question then becomes whether high-performing firms invest more in IT, or does IT translate into high-performing firms? In other words, how is causality sorted through and endogeneity eliminated? Brynjolfsson responded:[1659]

> Well, instrumental variables are one way, though it is hard to find instrumental variables. We have looked at installations of ERP[1660] systems and have data from the major vendor, SAP, with dates of system purchase and dates when the system went live. This helps us sort out causality because one hypothesis is that technology systems create productivity and generate more revenue for the company; an

[1656] See chapter 4 or a discussion of Mills' work.
[1657] This statement comes from a transcribed speech, Dale Jorgenson (April 12, 1997), "Computers and productivity," *Conference on Service Sector Productivity and the Productivity Paradox*, Centre for the Study of Living Standards, Ottawa, Canada, April 11-12, 1997, p. 4. This comment is discussed in chapter 4.
[1658] Interview, August 11, 2011
[1659] Interview, August 11, 2011
[1660] ERP stands for Enterprise Resource Planning.

> alternative hypothesis is that companies with lots of revenues, for some other reason, go out an buy technology, which would create a spurious correlation. We found, though, that the purchase was not correlated with performance, going live actually was. So, this provides strong evidence that technology causes profits, not that profits cause technology.

As Solow remarked, the language of business economists will gravitate towards the bottom line. Still, the way in which the concept has morphed and wandered to be, at times, conflated with profits and other indicators of firm performance, suggests a leeway in its interpretation – plasticity. The research posits that the productivity paradox strained the use of "productivity" as a gauge of economic performance and success – and whether or not the paradox has been explained away through the measurement of intangible capital, learning lags, or other claims, the evidence supports the claim that new economic indicators began gaining currency among academics, political elites and the general population. The conflation between competitiveness and productivity – a perilous trend in evidence during the 1990s according to Paul Krugman[1661] – exemplifies the shift in discourse and meaning.

The financial boom of the 1990s and meanings of productivity

Although this dissertation did not specifically cover the financial sector and the way in which the financial boom in the 1990s and subsequent collapse may or may not have affected productivity, a question may be raised as to whether or not the dramatic rise of this sector, too, applied pressure on the utility of productivity indicators to provide accurate gauges of economic success. While Erik Brynjolfsson considers that the growth in financial services had the effect of over-estimating productivity for the economy as a whole, he also believes that what was illusory about the growth has since been subtracted from calculations. More threatening to the real productivity of the country, he thinks, is the way in which high salaries on Wall Street have attracted talented individuals, who otherwise might have become innovative "productive engineers." In what he calls the zero-sum game of Wall Street, talent was siphoned off from

[1661] Paul Krugman (March – April 1994). See chapter 8 for a further discussion of this work and its implications for the productivity discourse during the 1980s-1990s.

those, who create wealth, to those, who distribute wealth. This, he remarks, is a *real* problem, not a measurement problem.[1662]

In an article written for *The New Republic* in 2010, Solow in fact describes the potential effect of new developments in the financial sector on the economy in terms slightly different from those described by Brynjolfsson. Solow queries the usefulness to the economy of betting large sums of money on another's bond issue for one and then questions whether new technologies enabling accelerated transactions matter to the *real economy:* "It can be enormously profitable to the financial services industry, but that may just represent a transfer of wealth from one person to another. It remains hard to believe that it all adds anything much to the efficiency with which the real economy generates and improves our standard of living."[1663]

Whereas Brynjolfsson captures the loss in terms of a brain drain, Solow differentiates material products from financial products, by characterizing the latter in terms of transactions: "For one thing, there is no limit on the amount you can bet on the outcome of a transaction, whereas the amount you can bet on a car is the price of a car … wouldn't you draw a distinction between buying a car based on an advertisement and then two people observing the transaction and one of them saying, 'For a million dollars, I bet he will sell that car in two years?'"[1664] Taken from another angle, when asked how financial instruments may be different from machine tools, if both create wealth, Solow answered:[1665]

> In that respect, the two are not different … but what I was suggesting in this article is that there is an important distinction between private and social wealth, and I suspect – I don't know this – that the financial machinery has grown so large and so elaborate that the contribution of yet another bond trader at Goldman Sachs … is adding very little to society's wealth. Whereas the first person, who had the idea of limited liability corporations, making it possible to sell stock and collect savings, and finance the corporation, not out of one or two very rich people, but out of several hundred only slightly rich people is, I think, making a contribution to society.

[1662] Interview, August 11, 2011
[1663] Robert Solow, "Hedging America," *The New Republic* (January 12, 2010). See: http://www.tnr.com/article/books-and-arts/hedging-america

[1664] Interview, March 10, 2011
[1665] Interview, March 10, 2011

Both Solow and Brynjolfsson differentiate creating wealth from distributing wealth. In this last response, though, Solow is making yet another level of distinction, essentially drawing a normative line between distributing wealth among a "collective body" of some size and one that allocates wealth to the few. But, what is important to note for the purposes of this dissertation is that each of the creators of wealth described – the making of machine tools, the invention of limited liability corporations, and new-fangled derivative instruments – indiscriminately show up in the productivity statistics. From the numbers to the interpretation of what may or may not be ultimately beneficial for society as a whole gets lost in translation.

As has been argued in this dissertation, economists understand the implications and limitations of the assumptions they make. When asked if there are dangers in mistaking beauty for truth,[1666] Solow responded:[1667]

> Models are parsimonious and sometimes useful representations. Are there dangers in mistaking beauty for truth? Of course there are … but not all model building is victim to that. Sometimes people who do model building – whether neo-classical model building, neo-Marxian model building, or neo-anything – fall victim to the notion that this is so lovely that it just has to be right. Sometimes they will fall victim to other fallacies. You want to organize the model-building industry so that there are hungry assistant professors looking for tenure, who will read this and say, 'Oh, boy, a nice case of falling in love with symmetry but shouldn't,' and will hope to make a killing by pointing that out.
>
> I remember someone quoting to me once, long ago, that there was a movement in physics to do some sort of pure mathematical physics. Two of the great physicists of our time, Richard Feynman and Murray Gell-Man, wrote a methodological article opposing it, and they included a footnote to put this in the proper mathematical language, that given any number epsilon, any positive number, no matter how small, the relevance of this kind of physics would be less than epsilon. So, that happens in every discipline.

Summary: research outcomes

[1666] The reference is to an article written by Paul Krugman, "Mistaking beauty for truth," in *The New York Times* http://www.nytimes.com/2009/09/06/magazine/06Economic-t.html
[1667] Interview, March 10, 2011

As noted in the introduction, the puzzling way in which policymakers and political elites discuss productivity measures as though they capture the essence of economies provided the initial inspiration for this dissertation. More pointedly, the puzzle relates to a think-tank talk that was held sometime during the year 2001 at the American Institute for Contemporary German Studies, a part of Johns Hopkins University, in Washington DC. Although the exact wording of the diatribe eludes my memory, the idea that policymakers in Washington could rant about trailing productivity statistics in Germany struck me as odd. I was still readjusting to life back in the United States. In Germany, I had received excellent health care and family support. After the birth of our first child, for example, a midwife came to our home on a daily basis to help us provide proper care – we, foreigners in the country, as every Germany citizen, received a monthly non-means-tested stipend, *Kindergeld,* to help defray costs of raising children, diminishing the need to return to work until I thought the time would be right for the family. My first experience with medical care back in the United States, by contrast, took place in a windowless room, with stained carpeting. The nurse's aide had trouble locating the veins in my daughter's arm, and my daughter's eyes began to tear. When the aide then began chatting with us, I revealed that we had just returned to the States after having lived nearly ten years in Germany. "Oh," the aide sighed, as if commiserating: "socialized medicine."

The story is not intended to cast judgment on either the health-care systems in either the US or in Germany, nor on the relative health of the two economic systems. The story conveys how meagerly productivity measures capture either living standards or economic wellbeing, or enhance our understanding of what exactly we may mean by "productivity" or, indeed, of other economic systems. Why, then, do we obsess over them? And why have these measures exhibited such staying power over time and across industrialized countries? Why *would* Germans be less productive than Americans?

The research is predicated on the claim that the social discourse on productivity delivered a politically neutralizing message, suggesting that ensuing economic growth would be costless to the benefit of the collective whole – such accounts for its widespread appeal and organizing potential. What might account

for its staying power? The research provides support for the hypothesis that the scientific conceptualizations of productivity do not derive from essentialist properties, but shift in relation to the social context at specific historical junctures. Moreover, the research suggests that these shifts can traverse space through the influence of ideas that find resonance in countries, for example, characterized by different institutional configurations and economic systems. A secondary claim posits that ideas about productivity are transferred across countries through competitive pressures, or the rhetoric of competition, as represented in productivity statistics and country rankings. Last, the research suggests a process through which ideas about productivity create discourse and spread throughout societies. The scientific discourse on productivity initiates the spread, followed by its inclusion in policy debates and later becomes reflected in the popular discourse; this process of spread fits the description of discourse as a "pattern of activity."[1668] A summary of supporting arguments for these claims follows.

1. Politically neutralizing discourse. In the scientific literature and among political elites, policymakers and the population, generally, productivity growth is accepted as contributing to economic growth, overall, as well as to higher living standards.[1669] The idea of a productivity surplus – whatever results in a greater level of output without increasing inputs invested – is politically neutralizing by virtue of its core message: more for less, and for all. The fact that political elites and policymakers long made use of this argument during the 20th century to speed policy passage forward provides evidence of its rhetorical potency. The neutralizing power of the discourse also stems from the raw numbers and rankings, which hide ambiguities intrinsic to their construction. More specifically, the statistics provide benchmarks, making neutralizing comparisons – whether between time periods, countries or other entities – possible.

The political message also skirts distributional issues, although they are covered in the early works of economist Frederick C. Mills [1670]and were commented upon in the interview with Sloan business economist

[1668] This definition of discourse is the one adopted for this dissertation and comes from Patrick Jackson (2006), *Civilizing the ....* See chapter 3for a further discussion of this concept.
[1669] It is for this reason that economist Paul Krugman disparages the conflation between productivity and competitiveness. See Paul Krugman (March – April 1994).
[1670] Mills' work is reviewed in chapter 4.

Erik Brynjolfsson, who also differentiated the conditions leading to consumer surplus from those generating a producer surplus.[1671] This dissertation focuses on the neutralizing power of the discourse to move economic policies forward, without regard for whether these policies created equitable effects, or whether some social groups benefited more than others.

2. Social meanings attached to productivity and the posited source of its growth shifted at different historical junctures during the 20th century, reflecting changes in the social context. Broadly speaking, the way in which we conceptualized productivity was seen through *man* during the beginning of the century, which then shifted to *production process* following World War II, later becoming associated with *material product* during the 1960s and early 1970s, and finally as *intellectual product* in the 1980s and 1990s. These shifts are delineated – abstracted as ideal types – by first discerning shifts in the scientific literature and then recognizing the transfer of these conceptualizations to policy debates and the popular press.

An obvious counter-claim would be that productivity has, nevertheless, always been operationally defined as "output per input invested." Robert Solow, for one,[1672] finds the claim that meanings have shifted to be doubtful, particularly as it pertains to academic economists and business economists, key to developing the scientific discourse during the 20th century. In response to this counter-claim, I argue that the way in which output and inputs were defined, as well as the privileging of either the numerator or denominator in the scholarly press, shifted at different points in time. The posited source of productivity growth, more pointedly, was also reflected in these shifts. In other words, the ratio, itself, presents an unambiguous

[1671] See interview comments on p. 456.
[1672] See pp. 444-445 for his full response to this claim.

interpretation of the numbers calculated, technically defined as output per input invested; however, the numbers conceal the choices made to arrive at the numbers.

Whether ideal types represent "truth" is not in question, as ideal types are, by definition abstractions – an imperfect representation of reality. But, the fact that what we see in the scientific discourse, the wording and focus, then spreads to policy discussions and is later reflected in the popular press lends support to the formulation of the ideal types, conceptualized abstractions of the lens through which productivity became interpreted over time: from man to process, then to material product and intellectual product. Were, on the contrary, these representations not found in all of the discourse sources studied – the scientific literature, policy documents and debates, and popular press – the case for the ideal types, here presented, would be seriously weakened, as discourse, by definition, spreads to different social locations.

Situating these claims in an historical context lends added support to these claims. During the early 1900s, for example, after the introduction of Taylorism, efforts to improve *raw efficiencies* related directly to the laborer, the raw power derivable from man. At this time, plant managers calculated productivity numbers – raw counts were possible: real output per man-hour. During Fordism, by contrast, the focus shifted to production processes and how such could improve efficiencies through labor cost minimization – at a time when labor was relatively strong. Wages were theoretically (and politically) linked to productivity trends, thereby ensuring the income needed to maintain demand and production, an additional factor that trained focus on labor input. During the prosperous post-war years, before the oil crises of 1973, productivity began to be conceptualized through material products, as evidenced by the concentration on price indices and hedonic measures intended to capture added value in product quality – an accounting exercise that translates into expanded output, without affecting input investment. Once the productivity figures began to decline in the late 1970s, the discourse on productivity takes one last shift for the century and looks for sources of prosperity in intellectual products, or knowledge-based products deriving from "high technology."

I claim that the elusiveness of productivity growth during this time created fissures in the discourse (or an opening for transfiguration), which was most clearly revealed by the conflation of productivity with alternative performance measures, most notably competitiveness, ensuring that intellectual *products* – or what was then being called *high-tech* products – became associated with growth, not intellectual *processes*. At this time, the rhetorical switch to competitiveness and a search for "value" in IT provided an opener for new voices in the productivity discourse: business scholars and business economists, who concentrated their analysis on firm-level data not national aggregated data. Finally, new output attributions, such as intangible capital (more closely associated with firm-level operations) and other difficult-to-measure components, further strained the discourse that had isolated productivity, proper, as the source of social prosperity and wellbeing.

Whether or not productivity has essentialist components – that given perfect knowledge a faultless productivity formula would be at hand – is a claim that cannot be definitively rejected. Shifts in meaning, of course, may represent a kind of awkward progression towards the "truth." The arguments I advance to counter this challenge are, *first,* that the shifts relate closely to changes in the social context, an outcome which, intuitively, runs counter to the idea that meanings are grounded in a deeper "reality" or "essence." *Second*, a role for contingency and artifact in the construction of productivity concepts and indicators can be inferred from the observation that the discourse morphs and also weakens when it fails to deliver on its promise, precisely when it is poised to succeed. The failure of work-transforming information technologies to produce compelling gains in productivity statistics provides one clear example. At this time, as has been noted, the discourse on prosperity and growth starts to enlist additional economic performance indicators– such as competitiveness – exactly as is done in war, when battles are being only limply fought and reinforcements are consequently called in. *Third*, the fact that consumer valuation – demand – plays such a critical role in the statistics calculated, in and of itself, calls their objectivity into question.

As a final point in support of the claims made, it was not clear from the interviews conducted that academic economists, central to the debate on productivity, would question the arguments here advanced. It bears

remembering that Robert Lipsey, at one point during the interview with him, described the goal of productivity as "what goes on in the minds of people,"[1673] a comment implicitly conveying constructed social value and meaning to what we commonly consider to be a scientific given or a natural law. This notion is further underscored by Robert Solow's objection to alternative conceptualizations of productivity if for no reason other than the fact that they are not "measurable."[1674] These thoughts square entirely well with the analyticist research tradition, whereby pragmatic decisions are made to assess abstractions of reality. That the concept of productivity becomes reified into a principle grounded in non-ambiguous essentialist properties is likely attributable to the statistical measures that represent productivity and the way in which the scientific discourse becomes appropriated by political elites, the business community and the general population, at large.

3. Ideas spread through competitive pressures created by constructed economic indicators. The research supports the claim, long held in the literature, that large numbers are causal:[1675] political elites frequently cite numbers as a way to move legislation or economic policy forward; numbers are comparative, either over time or across space, which confers their power as benchmarks and gauges of policy success or failure. The question that remains ambiguous, and is not definitively answered by the research, is whether the rhetoric of competition is causal[1676] or if underlying structures, tendencies "selecting for" competition constitute unobservable causal mechanisms.[1677] That is, are societies essentially competitive due to intrinsic structural elements that define them (or individuals that comprise them), or does the rhetoric of competition provide us with ideas of what are interests are?

Observations can be made that *may lend support* towards one interpretation of what is causal over another. The research, for example, has shown that productivity provides benchmarks, or gauges, and numbers are everywhere prevalent in public debates as signposts for needed action. This "alert" for action, as *causal*,

[1673] See p. 438 for the full quote.
[1674] See pp. 442-443 regarding this exchange.
[1675] See, for example, …
[1676] This is a challenge presented by Patrick T. Jackson in an e-mail exchange, dated November 21, 2011.
[1677] Per the critical realist research tradition as reviewed in chapter 3.

can only be explored by posing a counterfactual: had the numbers not been available, would the case for action have been clear? The research suggests that the numbers were critical for policy passage, and this is most evident in cases where the numbers were trailing expectations. The first modernization plans for France, for example, are rife with comparisons between competitor nations – principally the United States – the emerging world power.[1678] Numbers in these plans are clearly used as ordering mechanisms.

This mechanism – an alarmist call to action – is also clearly evident during the late 1970s – both in France and in the United States – when productivity growth was slowing for both countries. This time period represents a critical juncture for the United States, particularly as the country had been considered the leader in productivity growth up until this time. The link between what was perceived to be decline – articulated strictly in terms of the numbers – and the urgency with which legislators attempted to pass the Bayh-Dole Act and the Stevenson-Wydler Act cannot be overlooked. During the debates, the domestic systems of countries posting high growth rates – Japan at this time – become the focal point of discussion.[1679] In other words, it would seem plausible that competition does at least some of the heavy lifting in terms of explaining the transfer of economic ideas from one country to another.

Such is not to suggest that productivity growth and related concepts always function as gauges of *relative* performance in purely competitive terms. Congressional debates on the Marshall Plan, for example, deployed the rhetoric of productivity, for one, as a way to enable an exit strategy. The United States could benchmark a time to withdraw aid to Europe using productivity levels as guides.[1680] The elimination of the Soviet threat, by contrast, could not so easily be benchmarked. For the Employment Act of 1946, no arguments were made linking higher productivity to full employment; on the contrary, arguments were leveled against wage increases surpassing workers' "productive" capacity. Full employment guarantees would threaten productivity levels – such was based on a simplified formula, backed by powerful rhetoric, which helped to dilute the original bill. As a third example, the research demonstrates that Taft-Hartley

[1678] See excerpts from the debates in chapter 6, for example.
[1679] See coverage of congressional debates in chapter 10.
[1680] See coverage of congressional debates in chapter 7.

passed, not by comparing productivity statistics across countries, but simply by a call to minimize lost production days – itself related to the discourse on productivity for that time period, but not as an alert relating economic performance to other countries.

In fact, these outcomes are not surprising given the economic and military status of the United States following World War II: the US was the prosperous hegemonic power at the time. The productivity discourse resonated strongly in the United States at this time, but its message was strongly linked to labor and production issues, the chief challenge to "economic stability" at that time, not competitive pressures. This result squares with claims made in this dissertation that ideas are likely to flow from a dominant power to a lesser power (or a country posting superior results in terms of economic growth or any other indicator that is socially valued, for that matter), which itself conveys a principle of competition. Prosperous countries provide the model to emulate; in this case, productivity statistics and processes assumed to promote productivity growth provided the gauge. It is during this time that French political elites and policymakers imported production process ideas from the United States; the US was the reference country in terms of how productivity growth was to be achieved.[1681] Industry concentration (at least in the case of steel), business organizational practices and production automation counted among the US practices that inspired French planners in the name of productivity growth.

That countries emulate the practices of those deemed prosperous, or successful, by whatever measure, would be a prosaic proposition were it not for two additional arguments that can be drawn from this claim – both help explain mechanisms of change. The first argument to be leveled, based from this research, is that institutional configuration is not as exogenously determining in terms of economic organization as is posited in various theories of political economy – such as the varieties of capitalism literature. This research has demonstrated the ease with which ideas traversed the Atlantic, influencing institutional organization – in that order. During the postwar years, the way that INSEE became organized and accommodated new missions is but one example of how new ideas influence, or empower, old institutions.

[1681] The influence of US ideas of productivity among French elites, policymakers and managers are discussed in connection with the work of Marion Fourcade, chapter 2.

The fact that productivity centers sprang into existence in France following influential exchanges, whether officially through the Marshall Plan or through private initiatives, such as that laying the groundwork for INSEAD, is highly suggestive of the power of ideas, in addition, to create new institutional structures. That the US can respond to slowing productivity growth by passing the Bayh-Dole Act in an effort to alter the institutionalization of knowledge, a move that France followed, provides still another example of how ideas influence institutional configuration – ideas come first.[1682] As such, this dissertation helps answer the nagging puzzle plaguing the varieties of capitalism literature: how did those determining institutions come into existence in the first place?

Second, like the non-extraordinary observation that countries emulate "model" countries, the claim, or supposition, that the source of change in economic organization can be traced to competitive pressures would be a fairly uninteresting postulation unless the pressures were challenged as socially constructed. If it is the latter, then again, the implications allowing for change in economic organization are limitless; a pre-ordained terminus – the same endpoint for all economies – based on general equilibrium theory, or any other teleologically oriented theory would prove elusive. If accepted, we would not either need to typecast economies, but could, instead, analyze them for their dynamic potential. Still, the question remains: can ideas gain resonance without the "coercion" of competition?

The question is difficult to answer and was not part of the original research aim of this dissertation; the question fell out of the research. It is useful to revisit Waltz and think about the way in which he describes the theory:[1683]

> The theory depicts international politics as a competitive realm. Do states develop the characteristics that competitors are expected to display? The question poses another test for the theory. The fate of each state depends on its responses to what other states do. The possibility that conflict will be conducted by force leads to competition in the arts and the instruments of force. Competition produces a tendency towards sameness in competitors.

[1682] See Mark Blyth (2002), *Great Transformations: economic ideas and institutional change in the twentieth century,* New York: Cambridge University Press, p. 44
[1683] Waltz (1979), p. 127

Waltz goes on to suggest that competition is not limited to the military and that states can be *socialized* to emulate international practices, even when it might not be their "preferences."[1684] The reasoning suggests that countries are responding in some preordained manner, as though it was natural, given tendency.

But, the fact that contestation to the ideas presented surfaced in public debates on productivity both in France and in the United States during the last century suggests that we do not inevitably – in a structural sense – fall prey to competitive pressures, nor do we automatically attempt to emulate what others are doing. That is, contestation casts doubt on one of the wagers considered in this dissertation that competitive pressures represent some kind of underlying structural constraint, causing us to gauge our progress relative to others, and act to address the deficit. Nevertheless, the way in which economic indicators – regarded as objective, unambiguous representations of progress, wellbeing, or any other social value – provide benchmarks against which to gauge success, in fact, appears to invite competition. And, competition generates a way to norm the world; economies move towards "sameness" in an effort to outrank other countries – a counter-Durkheimian conclusion,[1685] maybe, but one that merits reflection and further scrutiny.[1686]

In an article from *The New Yorker,* Malcolm Gladwell explores the way in which annual college rankings as published in *US News & World Report* are used as benchmarks by college presidents to judge their management performance:[1687]

> According to Michael Bastedo, an educational sociologist at the University of Michigan who has published widely on the *US News* methodology, 'rankings drive reputation.' In other words, when *US News* asks a university president to perform the impossible task of assessing the relative merits of dozens of institutions he knows nothing about, he relies on the only source of detailed information at his disposal that assesses the relative merits of dozens of institutions he knows nothing about: *US News.* A school like Penn State, then, can do little to improve its position. To go higher than forty-seventh, it needs a better reputation score, and to get a

[1684] Ibid., p. 127. This point is noted in chapter 3.
[1685] "Indeed when competition opposes isolated individuals not known to one another, it can only separate them still more." Emile Durkheim (1984), *The Division of Labor in Society,* New York: The Free Press, P. 217
[1686] A good way to think about this question is through fashion. Fashion spreads, even when at first, we might not appreciate a new fashion trend, but it catches on: people begin to like what they see and seemingly feel compelled to follow fashion trends. But the response to this observation is that not everyone follows fashion trends; were we to accept that people simply conform to styles that may affect our social prestige and standing, our ability to explain change would be seriously challenged.
[1687] See http://www.newyorker.com/reporting/2011/02/14/110214fa_fact_gladwell?currentPage=1, pp. 3-4

> better reputation score it needs to be higher than forty-seventh. The *US News* ratings are a self-fulfilling prophecy.

Without delving into the murky area of whether or not productivity statistics create self-fulfilling prophecies, the passage clearly implies that rankings produce effects. Penn State may attempt to work its way out of the reputation trap by spending more tuition money on promotional efforts – one example. A country sitting high on productivity rankings may, by contrast, become complacent and conduct "business as usual," given its economic report card of robust health. It is important to recall that in interviews with both Robert Solow and Erik Brynjolfsson, the way in which a rapidly growing financial services sector contributes to productivity, particularly as it relates to the wellbeing of the country, was queried. Looking at the strong productivity statistics during the late 1990s would not have provided any alert for the ensuing financial crises – no doubt, the two economists would object that productivity statistics were never intended to perform such a task. Still, productivity statistics, as well as other economic indicators, *have come to be used* as gauges of economic health and social wellbeing. Legislative initiatives and economic policies, in general, have been based on them.

The research does not aim to suggest that alternative statistics should be used as guides or that statistical indicators should be done away with altogether – only that these indicators hide more than they reveal – the choices implicit in their construction – and assume meanings that may, in fact, be poorly reflected in the numbers. The second message – that statistics exert a pull towards "sameness" as countries attempt to compete in their rankings – is one deserving far more scrutiny than what has been provided in this dissertation. Still, the fact that countries use indicators, such as productivity measures, as benchmarks to gauge their success relative to other countries is as intriguing as it is banal. Countries compete – sure. But, productivity, even as it has come to be defined, need not be a zero-sum game.[1688] The productivity discourse – potently neutralizing as political rhetoric – may well have impoverished political discussions and policy debates by providing accepted social norms and statistical measures by which to gauge outcome, on a comparative basis.

[1688] Krugman (March-April 1994)

This dissertation does not demonstrate that "better" economies could have evolved with alternative conceptualizations of productivity, or without these indicators altogether. Nor does this dissertation attempt to question whether or how productivity surplus is generated – clearly outside the competency of the research. In a more limited way, exposing the possibility that the concept of productivity is contingent to particular historical junctures may help focus scholarly discussions on new mechanisms of change for economies and policies, for one – as well as widen the scope of analysis about particular statistical measures and whether their use as policy guides is likely to produce desired outcomes – and not least of all if alternatives may be available.

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