

Taxes, Petrol, and the Failure of the Mexican Fiscal System:

A Tale of Two Incomes

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Abstract

This paper integrates several decades of work on taxation, energy pricing, natural resource rent management, and environmental issues to produce a holistic vision of the perversions and consequences of Mexico's current fiscal regime. It is critical that Mexico increases the size and sustainability of both tax and petroleum revenues for the adequate provision of public goods. The key to this reform is divorcing the two revenue streams. Mexico's tax-and-petrol fiscal regime has four interrelated problems: 1) overall government revenues are too low; 2) government revenues are too dependent on petrol; 3) petrol revenues are used for current spending and energy subsidies; 4) investment in Pemex is driven by tax revenues rather than petrol prices. In analyzing the mutually distorting roles of Mexico's federal revenue structure, dependence on Pemex (the state owned petrol monopoly) and petroleum-based revenues, and mismanagement of petrol revenues, this paper clarifies the fiscal, distributional, and environmental imperatives for multifaceted reform of not only the tax system and energy sector, but also the way in which the Ministry of Finance interacts with them. It concludes by summarizing some of the most critical reforms to address these interlinked problems. These reforms include strengthening non-petrol based tax revenues, ensuring proper pricing of petrol products in the domestic market, and separating petrol revenues and investment in Pemex from short-term fiscal concerns of the government.

Keywords:

Mexico, tax, fiscal policy, energy subsidies, petrol, oil, fossil fuel, Pemex, reform, distribution

1. Introduction:

a. Why is this important?

Petroleum revenues play an all-too-important part in the fiscal system of Mexico, creating a complex and mutually distorting interaction. Petrol revenues represent a disproportionate and unhealthy share of government revenues, roughly a third of total government revenues.¹ The relative importance of petrol to Mexico's fiscal system is mirrored by the weakness of its tax system. Even including petrol revenues, the Mexican government has remarkably low tax effort, leading to low overall revenues and inadequate provision of public goods.² It is critical that Mexico increases the size and sustainability of both tax and petroleum revenues for continued provision—and needed expansion—of public goods. The key to this reform is divorcing the two revenue streams. **Mexico's tax-and-petrol fiscal regime has four interrelated problems:**

- 1) overall government revenues are too low;**
- 2) government revenues are too dependent on petrol;**
- 3) petrol revenues are used for current spending;**
- 4) investment in Pemex is driven by tax revenues rather than oil prices.**

Depending on petrol revenues is dangerous for a country: prices are not stable and production is not infinite. Although many scholars have written on the separate problems Mexico faces with regards to the management of its petrol resources and tax system, it appears no scholar has yet explored the interrelated problems of its dual revenue streams, and the ways in which they weaken one another.

¹ Jorge Martínez-Vázquez, "Mexico: An Evaluation of the Main Features of the Tax System," *Working Paper of the Georgia State University Andrew Young School of Policy Studies*, November (2001): 10.

² Martínez-Vázquez, "Mexico: An Evaluation of the Main Features of the Tax System," 4-6.

b. Background

Petrol, as an abundant income source, has been both a blessing and a curse for Mexico, hindering the development of strong fiscal institutions. Petróleos Mexicanos (Pemex), the state-owned oil company, has the exclusive right to extract fossil fuels from Mexican soil. Nationalized (i.e. expropriated from foreign owners) in 1938, Pemex is a “symbol of Mexican sovereignty.”³ The majority of Pemex’s revenues come from the export sale of crude petrol.⁴ The Mexican government draws petroleum revenues directly from fees on the company and indirectly via taxes on petroleum products.

b. Structure of the Paper

This paper will begin with an overview of the Mexican federal tax system, focusing on the way it draws revenues from petrol. It will discuss the forms of petrol revenues—excise taxes and direct payments by Pemex—and the problems associated with them, especially the pricing of petrol for Mexican consumers. Next will be a discussion of the inefficient manner in which investment decisions in Pemex are made. The pro-cyclical nature of investment, its divorce from petrol prices, and its place in the budget process will be emphasized. The paper will highlight the dangers to sustained production that this method of investment entails. We will conclude with a summary of reforms necessary to ensure the size and sustainability of Mexican petrol revenues for the 21st century.

c. Assumptions

In discussing a joint reform of energy and fiscal policy in Mexico, we are making two fundamental assumptions. The first is that full privatization of Pemex is not a politically viable

³ Valdes, "The Future of Oil in Mexico," 2011: 10.

⁴ Marco A. Oviedo-Cruz, "Beyond Optimal Extraction: Oil Revenue Policy Lessons under the Mexican Experience 1986-2003," (Yale University) March 2005: 5.

option for reform (yet). A brief review of attempted energy sector reforms during the last three administrations tells us attempts at “privatization” will significant resistance from the powerful bureaucracy, unions, and popular sector.⁵ Beyond an issue of vested interests, the exclusive right of the government to hold the nation’s hydrocarbon wealth is popularly supported.

Second, when suggesting policy that will necessarily have distributional consequences, we will assume policies must be at least neutral to be acceptable, and will preferably be progressive. As Segal highlights, all Mexican citizens are equally entitled owners of Mexico’s petrol wealth.⁶ Moreover, progressivity is already a rhetorical, if not realized, goal of Mexico’s government, as embodied in the progressive tax burden,⁷ and the popular *Oportunidades* transfer program, even if the net distributional effects of the fiscal regime are disputed (discussed later).⁸ We will also consider inter-generational equity a necessary element of policy.

2. Two Revenue Streams

We will begin with a brief overview of the Mexican tax system, in order to understand how petrol revenues fit into the larger picture, and then we will discuss the forms of revenue Mexico draws from petrol. These are primarily in the forms of an excise tax on petroleum products and direct fees and taxes on Pemex.

a. Tax Effort

Mexico has a remarkably low ‘tax effort,’ that is, the ratio of tax receipts to GDP. Only about 11% of GDP is collected annually as tax revenues, and this significantly hampers the

⁵ Christopher Ballinas Valdes, "The Future of Oil in Mexico: Taming the Beast Within - The Mexican Energy Regulatory Commission," (James A Baker III Institute for Public Policy of Rice University) 2011.

⁶ Paul Segal, "Fiscal Policy and Natural Resource Entitlements: Who Benefits from Mexican Oil?," (Oxford Institute for Energy Studies) May (2012): 6-7.

⁷ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 26.

⁸ Segal, "Fiscal Policy and Natural Resource Entitlements," 2012: 12.

ability of the government to finance and provide public goods that the population requires. In other words, the current system does not generate adequate revenues to meet the current, or indeed higher, level of expenditure many call for.⁹ In comparison, OECD countries on average have tax efforts 15% higher than Mexico, and the United States and Canada both have double the tax effort. Mexico's tax effort is lower than that of comparable Latin American countries such as Brazil, Argentina, Chile, and Costa Rica. Using a regression analysis to estimate what level of tax effort should be expected from Mexico if it were to follow international norms, Martinez-Vasquez estimates that it should represent 12.75%-16.75% of GDP, roughly 50% more than is actually collected.¹⁰

This low tax effort is primarily due to three factors: ad-hoc policies that undermine the fundamentally well conceived tax structure, failed tax administration (and subsequent tax evasion), and most peculiarly, the explicit and implicit effort of the government to keep the tax effort low and constant.¹¹ The goal of a low tax effort is a result of negotiation by the private sector and large taxpayers to keep overall taxes low. Martinez-Vazquez explains:

It has been the common, although not explicitly stated, policy within the Ministry of Finance during much of the last two decades that any increase in revenues should be spent by the Ministry itself in the form of rate reductions of tax expenditures rather than on the expenditure side of the budget by line Ministries and other budget units. To a large degree, the goal of keeping tax effort constant was a significant result of the "negotiated" tax burdens agreed upon by the government and the representatives of the private sector. The political economy of taxation in Mexico has involved periodic discussions and agreements between, on the one side, a willingly compliant compact of large taxpayers (with and without...PEMEX), and, on the other side, the government authorities agreeing on the overall level of tax effort."¹²

⁹ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 2, 5.

¹⁰ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 6-7.

¹¹ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 3-4.

¹² Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 3-4.

Beyond the obvious reason for the private sector to desire low taxes, low overall tax effort is supported by widespread taxpayer doubt that taxes are well spent and equally apportioned.¹³ Thus, low tax morale contributes to low tax effort in a vicious circle.¹⁴

b. Dependency on Petrol Revenues

The discussion thus far has been with regards to tax revenues rather than total government revenues. General government revenues—comprised of central and sub-national revenues, social security revenues, and “extra budgetary funds” (i.e., petrol)—were a relatively stable 18.82% of GDP from 1980-2000.¹⁵ Hydrocarbon duties (i.e., revenues extracted from petrol, including indirect VAT, excise taxes, and Pemex revenues) contribute more than a third of the federal budget.¹⁶ Oviedo-Cruz calculates for the period 1986-2002, concluding total government revenue was 15.5% GDP, with petrol duties equaling 4.65% of GDP (33% of fiscal revenues).¹⁷ Over the period 1999-2009, Pemex contributed an average of 40% of total revenues to the government, about 8% of GDP. As Moreno-Brid and Ros write, Pemex has been, “transformed...into a tax-collecting agency...”¹⁸ Income taxes (corporate and personal) made up 31% of revenues, followed by VAT at 22%, both with significant fluctuations over the 20 year period, due to the business cycle, policy changes, and the fluctuations in petrol revenues. Excise and import taxes made up the remainder.¹⁹

¹³ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 4-5.

¹⁴ Benno Torgler, Ihsan C Demir, Alison Macintyre and Markus Schaffner, “Causes and Consequences of Tax Morale: An Empirical Investigation,” *Economic Analysis & Policy* 38, no. 2 (September 2008): 313-341.

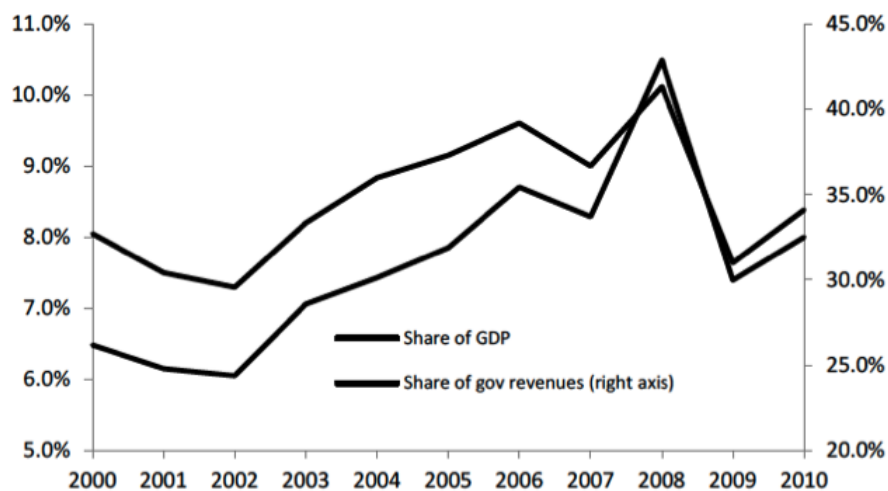
¹⁵ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 5.

¹⁶ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 10-11.

¹⁷ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 2.

¹⁸ J.C. Moreno-Brid and J. Ros, *Developement and Growth in the Mexican Economy* (New York: Oxford University Press, 2009): 244.

¹⁹ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 9-12.

Figure 1: Oil revenues as % of GDP and of government revenues

Source: Author's calculations based on data from the Secretaría de Hacienda y Crédito Público (SHCP)
 Note: Excludes IEPS from 2006 to 2008, when it is negative. See footnote 7.

20

Mexico draws revenues from petrol in three ways: primarily, through special taxes levied directly on Pemex, through an excise tax on gas (with peculiarities warranting an extended discussion), and through the Value Added Tax (VAT). 'Rights' (taxes) levied directly on the company account for 64% of all oil revenues. These break down into four categories:

1) Rights from petrol extraction:

A tax rate on the residual of all revenue from oil extracted minus expenditures, calculated per oil well.

2) Petrol profit tax:

Pemex is taxed on net profits, based on regular corporate income tax rules.

3) Special sales tax on petroleum products:

An excise tax on domestic sales of gasoline and natural gas.

4) Excess return right:

Any extra revenue from petrol price hikes, above the price predicted in the annual

²⁰ Segal, "Fiscal Policy and Natural Resource Entitlements," 2012: 10.

budget, reverts to the government.

Consumer taxes on gasoline make up 26% of petroleum revenues, and the VAT on hydrocarbon products makes up the remaining 10%.²¹ From 1986 to 2003, total petrol revenues averaged 67,705 millions of pesos per quarter, or 16.4 billions of 1993 US dollars, with a coefficient of variation of 21%.²² The variation in revenue depends on petrol prices, exports (i.e., sales), and public investment in Pemex.²³ The net direct impact of these petrol revenues on the economy is unclear, as Mexico is both a petrol importer and exporter, and a large, open economy.²⁴

The obvious conclusion to draw from this information is that the Mexican tax structure is too dependent on petrol, which will not create revenue buoyancy (the ability to generate automatic growth in fiscal revenues over time). Buoyancy occurs when the tax base grows along with the economy, because broader or steeper taxes have been enacted, or there is better enforcement. Revenue buoyancy is an important feature of a fiscal regime because demand for public services grows along with GDP, and buoyancy allows the budget to remain balanced without instituting new taxes. Average year-to-year buoyancy calculated for 1980-1999 was 0.93, just below keeping pace.²⁵

The biggest problem of high revenue dependency on petrol is that petrol reserves are finite, and petrol revenues are used for current spending (including energy subsidies, to be discussed later), rather than invested in future revenue streams. Like many governments with significant oil revenues, Mexico behaves as if it does not have a depletion constraint, i.e., "...as if they were dealing with infinite amounts of oil in the short term. For example, when they are

²¹ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 5.

²² Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 7.

²³ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 9.

²⁴ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 9.

²⁵ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 11-13.

facing lower prices, they do not cut production immediately, they sell as much as they can at the given price."²⁶ Oviedo-Cruz's empirical VAR (Value-at-Risk) analysis supports this claim.²⁷

Another problem presented by petrol revenue dependency is the well known "resource curse," a time-inconsistency problem in which the desire of politicians to "raid the coffers" today following a natural windfall is not sufficiently outweighed by the long-term need to save.²⁸ If Mexico fritters away its natural resource wealth on current spending without establishing other revenue streams to replace it, it will end up destitute.

c. Revenue Stability

Revenue stability has also been a problem for Mexico. During the period from 1980 to 1999, government tax and oil revenues had a high degree of volatility. Furthermore, tax revenues have tended to be pro-cyclical.²⁹ For example, the 2009 recession caused Mexico's GDP to fall 6.2%, but receipts from income taxes and VAT fell even further—8.9% and 14.5%, respectively. In response, the 2010 tax reform temporarily increased the maximum rate of the personal and income taxes to 30% for the top three brackets, and made small increases in the excise taxes on alcohol, tobacco, and gambling (it did not alter the petrol tax scheme).³⁰ To compensate for these fluctuations in bad times, hoarding revenue surpluses during expansions is required. However, these savings need to be higher for fiscal health than political feasibility usually allows. Instead, the Mexican government has displayed a preference for reducing revenues during upticks in

²⁶ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 24.

²⁷ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 47.

²⁸ David Victor, "The Politics of Fossil-Fuel Subsidies," *Untold Billions: fossil-fuel subsidies, their impacts and the path to reform* (International Institute for Sustainable Development Global Subsidies Initiative), 2009: 22.

²⁹ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 14-15

³⁰ Carlos Absalón and Carlos M. Urzúa, "Distributive effects of the 2010 tax reform in Mexico: a microsimulation analysis," ed. Carlos M. Urzúa, *Fiscal Inclusive Development: Microsimulation Models for Latin America* (Instituto Tecnológico y Estudios Superiores de Monterrey), 2012: 104.

collection rather than pay for seemingly ‘wasteful’ additional public expenditure. A constant, low tax effort is thus maintained. Martínez-Vázquez concludes, "Mexico's tax system has provided an unstable foundation to the federal budget and the behavior of overall revenues has tended to increase rather than dampen the swings in....the economic business cycle."³¹

Hydrocarbon revenues were, surprisingly, more stable than tax revenues and a-cyclical, with a weakly stabilizing effect, according to a report in 2000 by the World Bank.³² In fact, according to work by Oviedo-Cruz, Pemex is further used to stabilize revenues by increasing investment in oil exploration when there are positive tax collection shocks, as mentioned previously. Annually, oil and non-oil revenues have a clear negative correlation; when non-oil revenue as percentage of government expenditure has a positive shock of 1% from trend, oil revenue decreases 1%.³³ This is, in effect, a pro-cyclical expansion of future revenue-generating ability, with the purpose not of effective investment, but rather of low and stable tax (here, total revenue) effort, in the manner explained by Martínez-Vázquez.³⁴ Hence, this ‘stabilizing’ effect on revenues should not be regarded as a positive feature of the tax-and-petrol fiscal system.

d. Distributive effects of the tax system

It is difficult to conclude what the net distributive effect of the tax system is, as there is a serious lack of information regarding tax incidence (the way the tax burden actually falls in practice). Due to “high levels of tax evasion across practically all taxes,” there is a widespread perception that the tax system is unfair, which is an “important factor in Mexico for explaining the general resistance in the private sector to any increase in the overall level of tax effort.”³⁵

³¹ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 16.

³² Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 14-15

³³ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 12-13.

³⁴ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: abstract-3.

³⁵ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 28.

This is what Torgler identifies as “low tax morale” in Mexico, which is increased by knowledge of tax avoidance and corruption.³⁶ Typically, some progressivity is considered desirable in a tax system, but there are also conflicting beliefs as to whether the current system is too regressive or too progressive.³⁷ A 2001 assessment by Martínez-Vázquez concluded that the overall tax burden is progressive, with the poorest decile paying about 4% of their gross income in taxes, and the richest decile paying 27%, with a smooth increase between the deciles.³⁸ Although the system is, on paper, “quite progressive,” its impact on income distribution is very small.³⁹ Income remains very unequally distributed across the population, with the top decile earning 40% of all income and the bottom decile earning less than 2%.⁴⁰

3. Burning up Revenues: the Excise “Tax” on Petrol

A particularly convoluted and detrimental feature of Mexico’s petrol fiscal regime is its sometimes-tax, sometimes-subsidy on petrol. This is costly to the government, as it is paying out rather than receiving tax receipts, and highly opaque. It also has a range of negative effects on society: reducing innovation in energy technologies, regressively favoring the rich, and increasing carbon emissions.

In Mexico, gasoline and diesel are subject to the *Impuesto Especial Sobre Producción y Servicios* (IEPS, Special Tax on Production and Services). This is a special excise tax in addition to, and separate from, the Value Added Tax, and is recorded by the *Secretaría de Hacienda y Crédito Público* (SHCP, Ministry of Finance) as petrol revenue for the government. However, the primary purpose of the IEPS is to regulate domestic gasoline prices and smooth the

³⁶ Torgler et. al., “Causes and Consequences of Tax Morale,” 2008: 133.

³⁷ Martínez-Vázquez, “An Evaluation of the Main Features of the Tax System,” 2001: 20.

³⁸ Martínez-Vázquez, “An Evaluation of the Main Features of the Tax System,” 2001: 26.

³⁹ Martínez-Vázquez, “An Evaluation of the Main Features of the Tax System,” 2001: 27.

⁴⁰ Martínez-Vázquez, “An Evaluation of the Main Features of the Tax System,” 2001: 27.

international instability of petrol prices for domestic consumers, rather than to provide revenue for the government or reduce fossil fuel consumption.⁴¹ The domestic price of gasoline is set at the discretion of the SHCP, generally following the movements of the international price, but with a lag. IEPS and VAT are then added to this price. When the total domestic price of the gasoline, IEPS, and VAT is less than the international price, the SHCP is effectively subsidizing gasoline.⁴² According to the OECD, “A price-smoothing mechanism for gasoline and diesel can yield additional revenues in times of declining oil prices, but results in large implicit subsidies in times of rising oil prices. Since 2005 gasoline prices in Mexico have been below those observed in major trading partners’ countries owing to the large increase in oil prices.”⁴³ When international petrol prices rose from 2006 to 2008, IEPS effectively became a fuel subsidy—and not a minor one. In 2006 and 2007, the subsidy cost the equivalent of 0.4% of GDP, and in 2008, it represented an expense equivalent to 1.8% of GDP (remember that total government revenues are only 11% of GDP). This is particularly problematic because world petrol prices are generally expected to rise over time. The IEPS on petrol was revenue neutral in 2009 due the world price decline, but returned to subsidy status in 2010 as prices recovered.⁴⁴ However, the domestic price of petrol has steadily moved closer to international prices each month of the new Peña Nieto administration.⁴⁵ Since this movement is wholly discretionary, rather than automated to follow the market, it cannot be assumed to persist or taken for granted.

a. Hidden Revenues, Hidden Expenditures

⁴¹ Segal, "Fiscal Policy and Natural Resource Entitlements," 2012: 11, 19.

⁴² Thank you to Manuel Suárez-Mier for clarifying this point.

⁴³ OECD, "Economic Surveys: Mexico," (2011): 18.

⁴⁴ Segal, "Fiscal Policy and Natural Resource Entitlements," 2012: 11, 19.

⁴⁵ Manuel Suárez-Mier

The IEPS on petrol creates a transparency problem, because it is not recorded as a subsidy. Counting the subsidy as ‘negative petrol income,’ as the SCHP does, effectively masks the massive expenditure by making overall petrol revenues appear smaller.⁴⁶ Energy subsidies in Mexico are not reported, and this is “one of the greatest concerns surrounding the subsidies,” according to Marco Cancino, director of Inteligencia Pública, a consulting house.⁴⁷ This fits with the general trend of immediately disbursing petrol revenues, rather than including them in the budgeting process.

b. Impact on the Mexican Economy

The magnitude of the subsidy is critical, as its scale is such that it is actually preventing the Mexican government “from investing in more important endeavors and hampering innovation.”⁴⁸ Inteligencia Pública calculates that total energy subsidies (63% for electricity, 31% for gasoline and diesel, and 6% for liquefied natural gas) cost Mexico an average of 10% of its GDP over the period from 2005-2010.⁴⁹ The OECD calculates a much lower, although still significant, estimate of 1.5% of GDP between 2005-2009.⁵⁰ This is more in line with the most recent estimates from the IMF. In their 2013 report on energy subsidy reform, the IMF calculates that Mexico spent 2.39% of GDP in 2011 on all fuel subsidies, 1.98% being for petroleum products. These subsidies represented 10.79% of the government’s budget, 8.95% of which went to petroleum product subsidies.⁵¹

⁴⁶ Segal, "Fiscal Policy and Natural Resource Entitlements," 2012: 11, 19.

⁴⁷ Inteligencia Pública, "Consultant highlights energy subsidies' shortfall - Mexico," *Business News Americas*, August 31, 2012.

⁴⁸ Inteligencia Pública, "Consultant highlights energy subsidies' shortfall - Mexico," *Business News Americas*, August 31, 2012.

⁴⁹ Inteligencia Pública, "Consultant highlights energy subsidies' shortfall - Mexico," 2012.

⁵⁰ OECD, "Economic Surveys: Mexico," (2011): 18.

⁵¹ C. Cottarelli, A. M. Sayeh and M. Ahmed, "Energy Subsidy Reform: Lessons and Implications," International Monetary Fund (2013): 59, 64.

The main problem, Cancino argues, is opportunity cost: what the government could be investing in. For instance, energy subsidies are 10-times the size of the *Oportunidades* program, and, stunningly, are “larger than the federal health, security, science and technology budgets.”⁵² Cancino also notes energy subsidies cause “...a delay in the technological change of the industrial sector given that this sector does not have incentives to invest in efficient energy usage.”⁵³ Fuel subsidies are highly inefficient for recipients as well, because “fuel be preferred.”⁵⁴ In comparison, a cash subsidy could be spent on fuel, as well as any other good or service desired.⁵⁵ This inefficiency leads to welfare gains for subsidy recipients that are lower than the face value (and cost to the government) of the subsidy.

c. Distributive Effects

This is also a highly regressive subsidy, as the rich spend higher share of their income on fuel, and are more likely to own cars.⁵⁶ As Victor writes, energy subsidies are of “...much greater benefit to populations that already consume large quantities of energy-intensive goods and services. And while improving life for the poor is often cited as a motivation for subsidizing energy, the people typically receive very little benefit.”⁵⁷ In 2006, 70% of the benefits of fuel subsidies in Mexico went to the wealthiest 30% of the population.⁵⁸ In 2008, Mexico saw a massive growth of fuel subsidies, which were less regressive than in 2006, although still regressive in absolute terms. The richest 10% of the population gained 10-times more than the poorest 10%. The bottom three income deciles gained a relatively high share of their income

⁵² Inteligencia Pública, “Consultant highlights energy subsidies' shortfall - Mexico,” 2012.

⁵³ Inteligencia Pública, “Consultant highlights energy subsidies' shortfall - Mexico,” 2012.

⁵⁴ Segal, “Fiscal Policy and Natural Resource Entitlements,” 2012: 20.

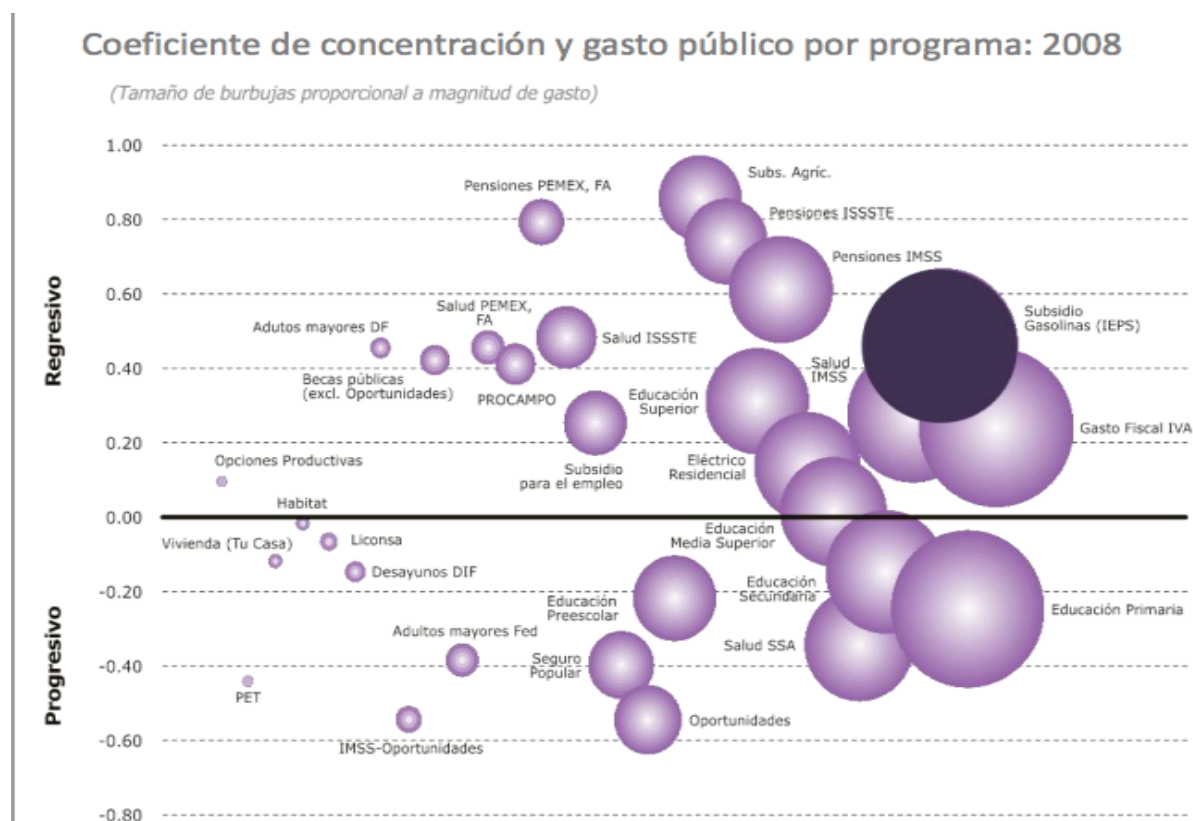
⁵⁵ Segal, “Fiscal Policy and Natural Resource Entitlements,” 2012: 20.

⁵⁶ Segal, “Fiscal Policy and Natural Resource Entitlements,” 2012: 20.

⁵⁷ Victor, “The Politics of Fossil-Fuel Subsidies,” 2009: 9.

⁵⁸ Segal, “Fiscal Policy and Natural Resource Entitlements,” 2012: Table 2.

from the subsidy, but overall it was still more regressive than government expenditures on average.⁵⁹ México Evalúa provides this helpful visual representation:



*El gasto en equidad en México, consideraciones sobre la desigualdad y la exclusion, 2011*⁶⁰

More generally, the richest 30% of the population receives 34% of the total energy subsidies while the poorest 30% gets 17%.⁶¹ In the case of electricity, a household of the richest 10% of the population receives nine times more subsidy than a household in the poorest 10%.⁶² This becomes particularly relevant to our discussion when we realize that 75% of Mexico's electricity is generated by burning petroleum.⁶³ The 2011 OECD Economic Survey of Mexico clearly reads, "A cash transfer system to compensate lower-income households, through *Oportunidades*

⁵⁹ Segal, "Fiscal Policy and Natural Resource Entitlements," 2012: 20.

⁶⁰ Instituto Mexicano para la Competitividad, "The High Price of Cheap Energy" (2012).

⁶¹ Inteligencia Pública, "Consultant highlights energy subsidies' shortfall - Mexico," 2012.

⁶² Inteligencia Pública, "Consultant highlights energy subsidies' shortfall - Mexico," 2012.

⁶³ Uri et. al., "An evaluation of the economic effects of higher energy prices in Mexico," 1997: 2.

or complementary schemes, would be a more efficient poverty alleviation instrument than VAT exemptions or other consumption subsidies, such as for energy.”⁶⁴

d. Environmental Effects

Basic economic logic tells us that the less expensive a normal good is to consume, the more people will consume it. Artificially cheap petrol means more petrol consumption. In this case, the consumptive behavior has a profoundly negative effect on the environment. In Mexico, the combustion of refined petroleum products is the primary source of carbon emissions—accounting for 72% of the energy consumption and 81% of the carbon emissions in 1994.⁶⁵ As Uri et. al. write, “The pollution problems associated with the combustion of fossil fuels in Mexico are legendary.”⁶⁶ This is not just a matter of concern for environmentalists, as even 20 years ago health damage *per annum* due to air pollution in Mexico City alone was estimated to equal USD \$1 billion by the World Bank.⁶⁷

Larsen and Shah conducted the last study to estimate the environmental impacts of Mexico’s fossil fuel subsidies in 1992, which provides a sense of the order of magnitude of their significance. They define subsidies technically, “as the difference between domestic fossil fuel prices and their opportunity cost evaluated at end-user prices.”⁶⁸ As petroleum is traded internationally, border prices plus mark-up for distribution equal ‘opportunity costs,’ i.e., world price.⁶⁹ At the time, they wrote, “gasoline prices in Mexico...are close to border prices, but

⁶⁴ OECD, “Economic Surveys: Mexico,” (2011): 14-15.

⁶⁵ Uri et. al., “An evaluation of the economic effects of higher energy prices in Mexico,” 1997: 2.

⁶⁶ Uri et. al., “An evaluation of the economic effects of higher energy prices in Mexico,” 1997: 1.

⁶⁷ Uri et. al., “An evaluation of the economic effects of higher energy prices in Mexico,” 1997: 2.

⁶⁸ Bjorn Larsen and Anwar Shah, “World Fossil Fuel Subsidies and Global Carbon Emissions,” *Policy Research Working Papers World Development Report* (World Bank - Office of the Vice President for Development Economics), 1992: 2.

⁶⁹ Larsen and Shah, “World Fossil Fuel Subsidies and Global Carbon Emissions,” 1992: 2.

substantial subsidies exist on other petroleum products."⁷⁰ Theoretically, removing fossil fuel subsidies would reduce consumption and carbon emissions in previously subsidizing countries. If the reduction in demand from the removal of subsidies was large enough to lower world prices, it could also increase consumption in non-subsidizing countries. It is highly unlikely this would be the case if Mexico reduced its subsidies.⁷¹ It is important to note that the elasticity of demand for fossil fuels depends on ability to substitute other fuels.⁷² Based on fuel consumption data from 1987, they calculate the removal of fossil fuel subsidies in Mexico would result in a carbon emissions reduction of 5538 tons, or 7% of 1987 emissions, assuming no world price effect.⁷³ Fossil fuel use, and subsequent emissions, has surely been on the rise in Mexico, so the magnitude of the effect, if not the percentage reduction necessarily, is likely to be even larger. Between 1970 and 1995, carbon emissions in Mexico increased 221%, making it the 14th highest emitter in the world.⁷⁴ Today, Mexico still ranks as the world's 14th largest emitter, emitting 462 million metric tons of carbon dioxide in 2011, a 44% increase from 1995—and 93% increase from 1980, representing a doubling of the rate of carbon emissions over the last 30 years.⁷⁵

A relevant consideration on the pricing of fossil fuels is that even at international market price, fossil fuels are still sold 'below cost,' that is, the sale price does not account for the costs of negative externalities associated with its production and consumption—like pollution. The IMF estimates the worldwide under-pricing of energy to be \$1.41 trillion a year. David Lipton, Special Adviser to the Managing Director of the IMF, frames the issue in smaller numbers: "The

⁷⁰ Larsen and Shah, "World Fossil Fuel Subsidies and Global Carbon Emissions," 1992: 7.

⁷¹ Larsen and Shah, "World Fossil Fuel Subsidies and Global Carbon Emissions," 1992: 7.

⁷² Larsen and Shah, "World Fossil Fuel Subsidies and Global Carbon Emissions," 1992: 8.

⁷³ Larsen and Shah, "World Fossil Fuel Subsidies and Global Carbon Emissions," 1992: 10.

⁷⁴ Uri et. al., "An evaluation of the economic effects of higher energy prices in Mexico," 1997: 2.

⁷⁵ Energy Information Administration, U.S. Department of Energy, www.eia.gov/countries/country-data.cfm?fips=MX#cde (accessed April 26, 2013).

question is whether a country should choose to let someone buy something for \$1 when the total cost—both of producing it and the costs imposed on society—are \$1.25."⁷⁶

e. Political Economy of Petrol Subsidies

Although paradoxical, fossil fuel subsidies are very ‘popular.’ Natural resource revenue distribution is ‘politically salient’ because it is subject to a sense of entitlement. As Segal writes, this is the probable explanation for “why many hydrocarbon-rich countries subsidize fuel prices: citizens believe that since it is their oil they should get it cheap.”⁷⁷ Removal of fuel subsidies has seen violent popular resistance in many countries, such as Bolivia. Mexico is no exception to the “perception that subsidies are an appropriate form of social assistance,” and the SHCP falsely asserted in 2007 and 2009 that fuel subsidies “support those who have the least.”⁷⁸ The truth is, of course, that fuel subsidies are regressive in Mexico—even according to SHCP, in a 2010 document.⁷⁹

Revenues and Investment in Pemex

Investment in Pemex has been highly inefficient, as investment decisions have been made primarily based on the needs of the Mexican fiscal regime rather than the needs of the company. Generally speaking, revenue stability for the Mexican government (i.e., for the fiscal system overall) has taken precedence over revenue maximization for Pemex. As Oviedo-Cruz shows, the Mexican government has used petrol revenue as substitute for debt for the purpose of revenue smoothing over the period of his study, 1986-2003.⁸⁰

⁷⁶ D. Wessel, “Rethinking Energy Subsidies,” *Wall Street Journal*, March 27, 2013: A2.

⁷⁷ Segal, “Fiscal Policy and Natural Resource Entitlements,” 2012: 6.

⁷⁸ Segal, “Fiscal Policy and Natural Resource Entitlements,” 2012: 26.

⁷⁹ Segal, “Fiscal Policy and Natural Resource Entitlements,” 2012: 27.

⁸⁰ Oviedo-Cruz, “Beyond Optimal Extraction,” 2005: abstract.

Oviedo-Cruz's Value-at-Risk analysis shows long-term investment in Pemex will not depend on petroleum prices.⁸¹ The overall strategy for Pemex is to maximize gross petroleum revenue in every period by selling as large a quantity of petrol as they can, at any price. This lack of price sensitivity is a serious failing, as maximizing sale quantity in each period is the antithesis of maximizing sale price, and thus profit, over the long term.⁸² The behavior of the Mexican government is common to many governments in which petrol revenues play a significant role, acting as if reserves are infinite and so the sale price is irrelevant to sale decisions.⁸³

Rather than strategically managing petrol sales (i.e., selling more when prices are high and holding petrol in reserve for future sales when prices are low), or even tying petrol sales to tax collection shocks, revenue streams are managed once earned through investment in Pemex. In times of high tax revenue, there is a high level of investment in Pemex, so revenues retained by company instead of feeding into a budget surplus. When tax revenues are low, petrol revenues fill the gap instead of being invested in Pemex based on efficiency considerations. Oviedo-Cruz's study shows a clear negative correlation between petrol and non-petrol revenue.⁸⁴

Instead, petrol revenues, and the reinvestment of petrol revenues in Pemex, are used as a counterweight to other budget distortions.⁸⁵ Oviedo-Cruz's VAR analysis shows tax shocks will have a greater impact on investment in Pemex than short-term petrol price movements or the long term price of petrol.⁸⁶ Investment in Pemex and petrol exploration increased when there were positive tax collection shocks, creating a pro-cyclical expansion of future revenue

⁸¹ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 3, 47.

⁸² Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 3.

⁸³ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 24.

⁸⁴ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 3.

⁸⁵ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 3.

⁸⁶ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 32.

generating ability. In other words, when times were already ‘good’ for the Mexican government, they increased their future ability to draw revenues from Pemex, but when tax revenues were generally low, the government further impeded its capacity to draw revenues from Pemex by failing to invest counter-cyclically.⁸⁷

b. Needed Reforms: Separating Tax Revenue and Petrol Revenue

Comprehensive Tax Reform

Clearly, the current tax system leaves much to be desired. Based on his evaluation of the tax system, Martínez-Vázquez notes five reform objectives. First, revenue adequacy: the political question of moving towards a tax effort in the 13-15% of GDP range.⁸⁸ In addition to significantly improving tax administration (i.e. tax collection), the Mexican government and private sector must explicitly agree to raise the overall tax effort to meet Mexico’s human and physical capital needs. This political question will be substantially easier to answer if the opacity of the tax system is reduced and tax morale improved by more equitable horizontal treatment of taxpayers.⁸⁹ Note that this tax effort is inclusive of taxes on petrol. Second, Mexico must achieve revenue buoyancy over time, to prevent ad hoc measures and keep pace with increasing demand for public services. Capturing relatively more personal and corporate income taxes, and reducing reliance on natural resource rents, can achieve this objective. Provisions to capture personal income taxes from the large informal sector may be necessary. Third, system simplicity is necessary for an enforceable system with lower compliance costs. Fourth, a fair distribution of tax burdens, and fifth, a reduction of the distortions caused by ‘special treatments’

⁸⁷ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: abstract.

⁸⁸ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 31.

⁸⁹ Torgler et. al., "Causes and Consequences of Tax Morale," 2008: 313-341.

under the tax regime are needed (and will improve tax morale).⁹⁰ Although Martinez-Vazquez argues for greater progressivity in the tax system, he himself notes it may be more progressive to have a neutral tax system capable of collecting revenues that can be spent progressively on social programs than it is to have a highly ‘progressive’ tax regime without such a spending regime.⁹¹ Changing the current distribution of government revenues, then, should be focus of efforts for increased vertical equity. Critically, the Ministry of Finance must no longer be permitted to smooth tax receipts by spending whatever additional tax revenues above the decided tax effort it collects. Surplus revenues must be saved or disbursed to line ministries via the budgeting process.⁹²

Removing Petrol Revenues from Current Spending

Petrol revenues should be transformed into other revenue streams, by purchasing other productive investments, and by funding the transition to greater tax-based revenue. Insulating petrol revenues from the Ministry of Finance could be achieved via a petrol revenue savings and stabilization fund, which would pay a fixed dividend.⁹³ In this way, a capital stock would be formed as a hedge against both petrol and non-petrol shocks, and provide revenue certainty. Oviedo-Cruz ran a test comparison of the effect of both positive and negative oil price shocks with and without a stabilization fund, and found a positive price shock produced more petrol revenue and investment in Pemex, and a negative price shock had less influence on public finances, than in the absence of such a fund.⁹⁴

Most importantly, holding oil revenues in an investment account diversifies the

⁹⁰ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 31; Torgler et. al., "Causes and Consequences of Tax Morale," 2008: 313-341.

⁹¹ Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 21, 27.

⁹² Martínez-Vázquez, "An Evaluation of the Main Features of the Tax System," 2001: 4.

⁹³ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 47-48.

⁹⁴ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 4.

government's revenue streams and keeps most of the petrol wealth safe from current spending. This enables finite natural resource rents to continue to provide indefinitely for generations of Mexicans to come, achieving greater intergenerational equity of natural resource benefits. Stabilization funds that save and invest national resource wealth are already in use in Norway, another oil producing nation.

Maintaining Appropriate Domestic Petrol Prices

As the OECD recommends, "Mexico should establish a mechanism that guarantees that gasoline prices do not deviate from their international reference and replace the price-smoothing mechanism with an excise tax."⁹⁵ This is central to the process of increasing the transparency of the tax and petrol fiscal regime. Not only will this clarify the situation, but it will also increase government's revenues while decreasing its expenditures—directly and indirectly. Maintaining—and automating—the domestic price parity with international market is a step in the right economic and environmental direction. The discretionary power of the government to suppress gasoline prices below the international price must be removed. An important second step is to set the IEPS as a proper excise tax, like the 'sin tax' often levied on alcohol and drugs, to account for the costs of fossil-fuel externalities. In the words of Larsen and Shah, "Correct fossil fuel prices are a *prima facie* first order priority in any economic policy to curtail greenhouse gas emissions."⁹⁶ As Uri and Boyd state, "One way of reducing the demand for private transport," which is key to carbon-abatement, "is to increase its cost, and given that the consumption of gasoline represents a significant cost in the use of an automobile, it is thought that raising the price of gasoline will result in a significant reduction in private vehicle

⁹⁵ OECD, "Economic Surveys: Mexico," (2011): 18.

⁹⁶ Larsen and Shah, "World Fossil Fuel Subsidies and Global Carbon Emissions," 1992: 1.

transport."⁹⁷ Victor notes that subsidy reform is an inexpensive and technically simple way to reduce climate change, especially for developing nations that are unwilling to ‘spend’ money on mitigation at the ‘expense’ of development—and that removing fossil fuel subsidies would be much more effective than the Kyoto protocol at reducing climate change.⁹⁸

Larsen and Shah also compute the (purely financial) welfare effect of removing the subsidies. They find, as to be expected, that, "In the long-run, removing fossil fuel subsidies will improve welfare, assuming no changes in world prices [from the removal of Mexico's subsidies]," which is a realistic assumption.⁹⁹ Again, based on the 1987 numbers, Mexico would see \$143 million USD in welfare gains—a number likely to be much larger now.¹⁰⁰

Uri and Boyd conducted a study in 1997 to estimate what the economic effects of a large (26.2%) increase in gasoline and electricity prices would be on the Mexican economy, as was planned after the 1994 ‘Tequila Crisis’ to recoup government revenues. Although this is a very different scenario than the removal of the IEPS subsidy, it gives us a sense what the economy-wide effects would be of an increase of the price of fuel. Using a general equilibrium model and analyzing the economy by sectors, they concluded such an increase would decrease total output by 0.31% , consumption 0.56%, total utility 1.29%, while raising government revenue by 0.31%. Their findings were robust to assumptions of the values of substitution elasticities.¹⁰¹ The effects were much more dramatic in individual sectors: petrochemical and steel manufacturing absorb 55% of Mexico's total energy consumption, while the transport sector absorbs 30%. Thus, we

⁹⁷ Uri et. al., "An evaluation of the economic effects of higher energy prices in Mexico," 1997: 2.

⁹⁸ Victor, "The Politics of Fossil-Fuel Subsidies," 2009: 9.

⁹⁹ Larsen and Shah, "World Fossil Fuel Subsidies and Global Carbon Emissions," 1992: 14.

¹⁰⁰ Larsen and Shah, "World Fossil Fuel Subsidies and Global Carbon Emissions," 1992: 18.

¹⁰¹ Uri et. al., "An evaluation of the economic effects of higher energy prices in Mexico," 1997: 1.

could expect a significant effect on price and quantity of goods produced.¹⁰² Gasoline consumption would fall dramatically—29%—a 1.11% decrease of consumption for each 1% increase in price. Carbon emissions would fall correspondingly. In comparison, the overall decrease in consumption would be about 0.99%, and in production, 0.05%.¹⁰³ Although the price increase would cause a utility decreases for all households, about 3.3% in total, the decrease in utility is progressive—i.e., the wealthiest households see relatively larger decreases of utility—as one would expect, given they are the largest benefactors of low energy prices. In the case of raising energy prices, the government is a "large gainer," with receipts increasing by 0.73%. All in all, Uri and Boyd conclude that, "It appears...that such a price increase is justified."¹⁰⁴

Improving Investment in Pemex

Adequate (i.e., increased) investment in Pemex is necessary to ensure long-term production and thus revenues. According to the U.S. Energy Information Administration, Mexico's annual oil production has declined steadily since 2004, from 3,848 thousand barrels per day to 2,936 barrels per day in 2012.¹⁰⁵ Moreno-Brid and Ros assess that, "unless considerable investment in exploration occurs soon, Mexico's oil reserves, extraction, and exports will decline sharply in the next ten years."¹⁰⁶ Optimal investment in Pemex would entail a policy of investment divorced from any shock outside of the petrol market, including and

¹⁰² Uri et. al., "An evaluation of the economic effects of higher energy prices in Mexico," 1997: 3.

¹⁰³ Uri et. al., "An evaluation of the economic effects of higher energy prices in Mexico," 1997: 8-9.

¹⁰⁴ Uri et. al., "An evaluation of the economic effects of higher energy prices in Mexico," 1997: 8-9.

¹⁰⁵ Energy Information Administration, U.S. Department of Energy, www.eia.gov/countries/country-data.cfm?fips=MX#cde (accessed April 26, 2013).

¹⁰⁶ Moreno-Brid and Ros, *Developement and Growth* (2009): 244.

especially Mexico's fiscal issues.¹⁰⁷ Moreno-Brid and Ros strongly support the increased and protected reinvestment of petrol revenues into Pemex.¹⁰⁸

Conclusions

The problems of Mexico's tax-and-petrol fiscal regime—revenue inadequacy, petrol dependency, petrol revenue squandering outside of the budget, and inefficient investment in Pemex are all driven by the political tendency to smooth revenues today instead of investing them in tomorrow. The Mexican government faces challenging, but critical, reforms, as the Peña Nieto administration plans to tackle tax and energy reform this fall. Although both have been attempted before, these two income sources need to be reformed together in order to create an efficient, equitable, and sustainable fiscal system capable of meeting Mexico's revenue needs. Without a more capable fiscal system, Mexico will not be able to make the investments in public goods required to foster growth and development.

¹⁰⁷ Oviedo-Cruz, "Beyond Optimal Extraction," 2005: 47.

¹⁰⁸ Moreno-Brid and Ros, *Development and Growth* (2009): 244.

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