Drug-Related Violence in Mexico: Is it Fueling Mexican Migration?

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ABSTRACT:

After Mexico's former president, Felipe Calderón, began his military crackdown on criminal drug cartels in late 2006, drug-related violence has escalated within Mexico and innocent individuals are increasingly becoming the targets of often gruesome acts of violence. As a result, many Mexicans live in fear of losing their livelihoods and even their lives. Meanwhile, Mexican immigration into the United States continues and, despite increased efforts at thwarting illegal border crossings, undocumented immigrants continue attempting to cross the border and start new lives in the U.S. This paper seeks to determine whether the recent surge in drug-related violence in Mexico is one of the principal motivations behind Mexican household members' decisions to migrate. Using an Ordinary Least Squares (OLS) regression model, this paper tests whether an increase in deaths from two forms of drug-related violence results in a significant increase in the number of domestic and international trips made by members of Mexican households. The results indicate that as the severity of drug-related violence increases, the total number of trips made by members of Mexican households (both to other Mexican states and to the U.S. and Canada) also increases. From the perspective of U.S. policymakers, these findings signify that any attempts to stem illegal Mexican migration to the U.S. must address not only economic determinants of migration, but also must focus on putting an end to the violence that currently plagues Mexico.

Key Words: drugs, trafficking, violence, migration, Mexico

I. INTRODUCTION

Although Mexico has been a key location for the production and movement of illegal drugs for decades, ever since Mexico's former president, Felipe Calderón, began his military assault on criminal drug cartels in late 2006, drug-related violence has escalated dramatically throughout the country. Mexican homicide rates have increased every year since 2004, as a result of more frequent battles among drug cartels to gain access to key trafficking routes to the United States (Ríos 2012). Additionally, the nature of drug violence has changed over the past several years, especially in terms of the types of violent acts perpetrated, the intended targets of these attacks, and geographical shifts in the centers of violence. Drug cartels are increasingly resorting to more repugnant tactics in order to instill fear in not only members of rival drug cartels, but also authorities and the general Mexican population. For example, more cartels are using various forms of torture, carrying out mass executions (rather than targeted murders of individuals), and even commiting such horrendous acts as decapitating bodies and throwing heads into primary schools (Ríos 2012). Whereas in the past the majority of victims to the violence were members of rival drug cartels, now a growing number of individuals, such as journalists, politicians, women, and children from diverse segments of the population, are being drawn into violent confrontations (Molzahn et al. 2012). Also, although typically viewed as a distinctive feature of U.S. border cities, in recent years drug violence has become more pronounced in areas of Mexico previously believed to be safe, most notably in parts of central and southern Mexico (Archibold 2012).

Meanwhile, Mexican migration (both legal and illegal) into the United States, a phenomenon which has been taking place for decades, continues, adding fuel to an already heated national debate on Mexican immigration. Although Mexican immigration to the U.S. has, as a whole, slowed down over the past decade (Cave 2011), there has still been a dramatic increase in the number of Mexican immigrants crossing the border and settling down in major U.S. border cities (Ríos 2011). Additionally, despite less overall Mexican immigration to the U.S., about 58 percent of the estimated 11.2 million unauthorized immigrants in the U.S. today are Mexican and the U.S. currently has more immigrants from Mexico – 12 million – than any other country in the world has from all countries of the world (Passel et al. 2012). The mere number of Mexican-born individuals living in the U.S. makes the issue of Mexican immigration nearly impossible to ignore. Understanding the driving force behind Mexican migration is vital if U.S. policymakers are to make any headway in stemming illegal Mexican immigration.

Violence and migration in Central American countries are frequently discussed topics among many scholars (Stanley 1987; Morrison 1993; Morrison and May 1994). This fact is not surprising, given the level of political violence that has, in the past, plagued countries such as Guatemala, Nicaragua, and El Salvador (Morrison and May 1994). Additionally, sizeable migration flows both within Latin America and between Latin American countries and the U.S. make the link between violence and migration in Central American countries a popular topic. In one particular study of Salvadoran migration to the U.S., the results of a time-series analysis suggest that during a tumultuous period in the country's history, beginning in 1979, fear of political violence was most likely the primary motivation behind Salvadorans decisions to migrate to the U.S. (Stanley 1987). Unlike Stanley (1987), who focuses on international migration as a method for individuals to escape from violence in their countries, other scholars

contend that those trying to protect themselves from harm's way may be more likely to turn to internal migration than to international migration way (Zolberg et al. 1987; Manz 1988).

This paper adds to the literature on violence and migration in Latin America by focusing specifically on *drug-related* violence and only violence within *Mexico*. Using an empirical approach, it will look at whether or not an increase in the intensity of drug-related violence in a given state results in a significant change in the number of migrants that Mexican households from that state choose to send to the U.S. and/or Canada, or to another state in Mexico. The objective of this analysis is to understand whether recent drug-related violence, controlling for general violence and other factors impacting migration decisions, has played a significant role in Mexican households' decisions regarding whether or not a member of the family or the whole family should emigrate or resettle in another state in Mexico. The findings would also suggest how an end to drug-related violence would impact the number of Mexicans choosing to immigrate to the U.S., specifically. Not only would this analysis provide greater insight into the principal factors that play a role in Mexican migration decisions, but, from a U.S. policymaker's perspective, the findings could be used to assess how important curbing drug-related violence in Mexico is to successfully stemming illegal immigration.

II. CONCEPTUAL FRAMEWORK

The objective of this section is to explore the ways in which drug-related violence in Mexico may impact migration-related decisions made by Mexican households.

The application of several broad micro-level migration theories can help explain why members of certain Mexican households leave their community of origin in search of another community, state, or country of residence. The first theory, the micro-level neoclassical economic model of migration, is one model of international migration in which one of the principal assumptions is that the decision to migrate is based on a cost-benefit analysis made by an individual rational actor (Sjaastad 1962; Todaro 1969, 1976, 1989; Todaro and Maruszko 1987). If an individual expects a positive net return from migrating, he/she will move. The benefits of migrating include the higher wages the migrant is capable of receiving after obtaining a job that matches his/her skill level (individuals will only choose to migrate if there is a wage differential between the place in which they reside and the place to which they intend to relocate.) The costs of migrating include the monetary payments and physical struggles required to reach the target destination; the costs resulting from the time lapse between the moment the migrant leaves his/her former job and the time the migrant is finally able to acquire a better-paying job in the new location; the costs associated with assimilating into a new culture and labor market; and the emotional costs experienced by the migrant as a result of parting with his/her kin, friends, and the comfort of home (Massey et al. 1993).

A second micro-level international migration theory is the 'new economics of migration' model that uses families, households, or other groups of production and consumption as the units of analysis. These groups of individuals act collectively both to maximize expected income by minimizing risks and loosening constraints resulting from various market failures, other than labor market-related failures (Stark and Levhari 1982; Stark 1984; Katz and Stark 1986; Lauby and Stark 1988; Taylor 1986; Stark 1991). Unlike the neoclassical model, this model does not assume that a wage differential must exist in order for migration to take place – even without wage differentials, households may choose to have one or more members migrate in order to diversify and hedge against risks and/or to get liquidity for investments, so as to improve household members' overall economic well-being.

The next theory of international migration is known as the "Dual Labor Market Theory" which, instead of looking at migration from the viewpoint of an individual decision-maker, looks at migration as stemming from the "labor demands of modern industrial societies" (Massey et al. 1993). The biggest supporter of this theory is Piore (1979), who argues that international migration is a result of a chronic demand for immigrant labor that is built into the economic structure of developed countries; these countries have a permanent and "unavoidable need for foreign workers" (Massey et al. 1993).

Finally, there is the 'network theory' of international migration, which focuses on the way in which interpersonal relationships among migrants, former migrants, and non-migrants connect the three groups in both areas of origin and destination. These networks encourage migration by both lowering the costs and risks of moving to a new locale, as well as increasing the expected net gains from moving (by making it easier for the migrant to find a (good) job once he/she has arrived at his/her destination) (Hugo 1981; Taylor 1986; Massey and Garcia España 1987; Massey 1990a, 1990b; Gurak and Caces 1992).

Although scholars such as Stanley (1987) and Morrison and May (1994) have examined the relationship between political violence and migration decisions, not much work has been done to examine the relationship between *organized crime-* and *drug-related* violence in *Mexico* and Mexican households' decisions to migrate. Analyzing how drug violence has affected migration-related decisions of Mexican households will contribute to the literature that ties together the topics of migration and violence. Taking a close look at Mexico, in particular, is vital if U.S. policymakers are to gain a complete understanding of the reasons behind Mexicans' decisions to migrate, especially to the United States. To think that this violence has had no impact on Mexican households' decisions related to migration is to ignore how violence has affected populations in other countries throughout history, such as in El Salvador (Stanley 1987) and Guatemala (Morrison 1993; Morrison and May 1994). In the case of Latin America, a region in which many countries have experienced their fair share of civil wars and other forms of violence, there is a clear pattern showing that major internal violence often results in an exodus of individuals searching for peace and security. Therefore, it is reasonable to suggest that Mexican households factor the level of drug-related violence in their states into their cost-benefit analyses when they are deciding on whether or not to migrate.

Using the neoclassical model of international migration, the recent surge in drug-related violence can be seen as increasing the net benefits to migration, thus providing a greater incentive for Mexicans to migrate. Violence increases the costs of staying in Mexico and, as such, also increases the benefits to leaving the country. Not only does drug-related violence threaten to take lives of innocent civilians, but it also disrupts commercial activity, making it harder for business owners to make a living. Drug cartels have been extorting businesses in many parts of Mexico, forcing them to pay high protection fees and intimidating them to the point that these businesses have had no other recourse but to go into bankruptcy (Ríos 2011). Additionally, the psychological effects of witnessing gruesome violence cannot be ignored, as seeing decapitated bodies on the streets and hearing or seeing threats directed towards civilians, politicians, and/or members of rival drug cartels (Ríos 2011) are potentially traumatizing experiences that can significantly affect an individual's emotional well-being. According to a Mexican nationwide survey by the National Statistics Bureau, 41% of respondents confessed to not feeling safe enough to walk outside in their areas of residence between the hours of 4 p.m. and 7 p.m. (Miglierini 2011). Without feeling safe and secure where they live, it is hard to imagine that Mexicans, surrounded by violence, do not even consider leaving their communities in search of a better life.

Now having mentioned some of the channels through which drug-related violence may impact Mexican households' decisions to migrate, four key hypotheses which logically follow logically from the above discussion are listed below:

> 1a.) An increase in the number of *drug-related executions* in a particular state results in a higher total number of reported trips to the U.S./Canada made by the members of households within that state.

> 1b.) An increase in the number of *deaths from drug-related aggressions* targeting authorities in a particular state results in a higher total number of reported trips to the U.S./Canada made by the members of households within that state.

2a.) An increase in the number of *drug-related executions* in a particular state results in a higher total number of reported *domestic* trips to a different Mexican state by the members of households within the original state.

2b.) An increase in the number of *deaths from drug-related aggressions* targeting authorities in a particular state results in a higher total number of reported *domestic* trips to a different Mexican state by the members of households within the original state.

The four hypotheses are grouped into two sets, with one set arguing that an increase in drug violence will result in an increase in *domestic* migration, and the second set arguing that an increase in violence will result in an increase in *international* migration (to the U.S. and/or Canada). The two hypotheses from each set differ only in which key independent variable is used as a proxy for the level of drug violence: the first independent variable is the total number of drug-related *executions* (in a state in a given year) and the second independent variable is the total number of *deaths from aggressions* targeting authorities by organized crime groups (in a state in a given year).

In each case, the null hypothesis is that the number of drug-related deaths has no effect on the number of trips made by Mexican household members. The alternative hypothesis in each case is that the number of drug-related deaths has a positive effect on the number of trips made by household members.

The choice to run regressions with two different independent variables was based on the fact that the two variables are not highly correlated with each other and they also arguably have different effects on civilians' perceptions of security. Individuals may feel their lives are more at risk when there are a large number of executions in their state than when there are a large number of deaths from aggressions targeting authorities. Because more and more civilians are among the victims of drug-related executions, they may feel their lives are more directly at risk if the number of drug-related executions in their state is high. On the other hand, when it comes to aggressions targeting authorities, civilians are not direct targets, so they may not feel as vulnerable. Therefore, distinguishing between these two variables by running separate regressions makes it possible to see whether households' decisions to migrate depend on whether household members feel their lives are in immediate danger, or whether the decisions simply depend on the general level of drug-related violence in their states, even if the violence is only directed towards authorities.

III. DATA

The migration-related data analyzed in this paper was gathered from data sets compiled by the Mexican Migration Project (MMP). The MMP's principal focus over the past few decades has been to obtain social and economic information on Mexico-U.S. migration, as well as to discern the characteristics and behaviors of those choosing to migrate from Mexico to the United States. Since 1982, the MMP has administered surveys in both Mexico and the United States during December and January of successive years in order to gather qualitative and quantitative data on individuals, households, and communities within Mexico. In general, about 200 communities are surveyed in each state in a given year and only a few states are represented by the surveys in a given year. Households are randomly selected to take part in these surveys and following the administration of them in Mexico, interviewers make their way to the U.S. to administer the same surveys to migrants who belong to those households interviewed, but who have settled down in the U.S. (MMP).

Although the MMP has conducted surveys in 134 communities located in 22 Mexican states (OPR 2012), this paper only uses data from 13 of those communities, located in six states (Jalisco, Guanajuato, Morelos, San Luis Potosí, Veracruz, and Michoacán). The total number of observations (the total number of households surveyed) in the final data is 2215.

Violence-related data was gathered from two separate sources. The first source is a database compiled by the Trans-Border Institute's Justice in Mexico Project. Project volunteers from the Justice in Mexico Project gathered data from weekly reports of drug-related killings (in each state) provided by the Mexican newspaper, *Reforma*. Although *Reforma's* reports of drug-related killings cover six years, from 2006 through 2011, and are available for all 31 Mexican states and the Federal District, this paper only uses data representative of households from the six previously mentioned Mexican states (Jalisco, Guanajuato, Morelos, San Luis Potosí, Veracruz, and Michoacán), and only for the years 2007, 2008, and 2010. The reason for restricting the data in this way is the data from the MMP and the Justice in Mexico Project only overlap for those six states and those three years.

In addition to the data from the Justice in Mexico Project, violence-related data was also gathered from a database found on the Mexican federal government website. The purpose of using this data was so that other forms of violence could be included in the analysis. Data for the total number of deaths from aggressions targeting authorities by organized crime groups is included in the final data set as one of two key independent drug-related violence variables. This variable was included in addition to the variable representing the number of drug-related executions because the two variables are not highly correlated (the correlation between the two variables is 0.12) and because it represents a different form of drug violence that could have a different effect on households' perceptions of being in danger and, therefore, on household migration decisions. Also, data on the number of reported rapes by state was gathered from the government database, to be used as a stand-in for general violence. Including this variable in the empirical model makes it possible to differentiate between the effect of *drug-related* violence and that of *general* violence on Mexican households' migration-related decisions. Furthermore, the variable for the number of rapes is not strongly correlated with either the number of drug-related executions or the number deaths resulting from aggressions targeting authorities (the

correlation between rape and the other two variables are 0.12 and -0.29, respectively). Therefore, rape can be used to control for the impact of general violence on households' migration decisions.

For decades, scholars have been identifying key factors that either promote or discourage migration. For example, World Bank staff made a list of determinants of migration, grouped them into push and pull factors, and then divided these two sets of factors into three separate categories: economic and demographic; political; and social and cultural. Some determinants of migration mentioned in this World Bank publication are poverty; unemployment; low wages; conflict, insecurity, and violence; poor governance; human rights abuses; and discrimination. Also, some "pull factors" promoting emigration are the prospect of higher wages and an improved standard of living; safety and security; political freedom; family reunification; and freedom from discrimination (Mansoor and Quillin 2006). Other scholars, such as Richter and Taylor (2006), focus on personal characteristics that impact migration decisions, such as gender, age, level of education, and income. Additionally, households must consider the costs of migration when making the decision on whether or not to migrate. Sjaastad (1962) mentions several costs that migrants will likely consider before making the decision on whether or not to migrate, such as the monetary costs of physically moving from one place to another (for transportation, food, and lodging); the opportunity cost of earnings foregone while traveling and looking for a new job; and the emotional costs of leaving one's community or country, along with one's family and friends and familiar surroundings.

After reviewing the literature on common determinants of migration, 10 control variables (in addition to the rape variable) were chosen to be included in the four regressions. Each of these, if excluded from the analysis, could potentially result in a biased estimate of the impact that drug-related executions and/or deaths resulting from aggressions targeting authorities have on household migration decisions. The control variables representing key determinants of migration are:

1) number of workers (between the ages of 15 and 65) in the household
2) number of household members
3) number of years of education of the head of the household
4) sex of the head of the household
5) age of the head of the household
6) a dummy for whether or not the household has running water
7) a dummy for whether not the household has sewage
8) a dummy for whether or not a household member owns a business in Mexico
9) a set of dummies representing the type of floor (dirt, cement, finished, or wood) a household has
10) a dummy for whether or not the household has a vehicle

The number of workers per household was included as a control variable because an often-cited reason why individuals migrate is in order to find better economic opportunities -- either to get a *better* job or simply *any* job (Massey et al. 1998). According to the micro-level neoclassical economic model of migration, individuals conduct a cost-benefit analysis before making the decision on whether or not to migrate, and one of the clear benefits of migrating for unemployed or underemployed individuals is a higher expected income and a higher standard of living (Sjaastad 1962; Todaro 1969, 1976, 1989; Todaro and Maruszko 1987). The number of

household members is an important control variable because the quantity of people in a household is directly related to the amount of money required to support that family and it is also related to the number of individuals who are able and willing to work, either at home or in another location.

Several variables focusing on characteristics of the head of household (age, years of education, and sex), were included because the characteristics of the head of a household are often strongly correlated with the economic well-being of other members and they also have an influence on the level of education and the employment status of other household members, which have been shown to be two of the most important drivers behind migration (Massey et al. 1998). The education of the household head is important, because if the household head is well-educated, his/her children will likely have better educational opportunities. Similarly, children of a household head with little formal education will likely receive little education. Furthermore, individuals with lower levels of education in Mexico are reportedly more likely to migrate to the United States (Esipova et al. 2010). As for the sex of the household head, it is important to note whether the household head is female or male because there is evidence that in situations where only one adult is earning income in a household, female-headed households are more likely to be poor than male-headed households (Snyder et al. 2006). The age of the household head is important because it may impact whether or not he/she can hold a job, provide for the family and/or be able to migrate.

Next, control variables representing a household's access to infrastructure are included in the analysis. These variables are dummy variables representing whether or not a household has running water and sewage. Both of these variables are important to include in an analysis of household migration decisions because both indicate how well-off financially a household is (and therefore, may indicate whether there is a strong enough incentive for household members to migrate in search of a better life), and they also are correlated with the health of household members, as dirty water and poor sanitation often lead to illnesses/diseases. Unhealthy individuals may either seek to migrate to a location where they have better access to clean water and sanitation, or they may be so sick that they are unable to migrate. Therefore, it is important to include both variables to see what type of effect they have on a households' decision on whether or not to migrate. Another variable that represents whether or not a household owns a vehicle is included because owning a vehicle is a very good indication of how wealthy a household is. Whether or not the household owns a business in Mexico is also included in this analysis because individuals who own businesses in areas experiencing high levels of violence likely suffer financially as a result of lower commercial activity (as fewer people will feel safe venturing onto the streets). Also, the physical building out of which the business is run could potentially be destroyed if there is an outbreak of violence close to the building's location. Therefore, if business activity is low and the risks of losing the business are high, this might sway a household to relocate.

As for the two key independent violence-related variables, there is the variable representing the number of drug-related executions and the variable representing the number of deaths resulting from aggressions targeting authorities. An "execution" is defined by the Mexican government as a death with extreme violence where the victim and/or perpetrator is/are assumed to belong to a criminal organization. "Deaths from aggressions targeting authorities by organized crime groups" are defined by the Mexican government as deaths that are the product of attacks by organized crime groups against authorities from any of the three levels of government, with or without an armed response (SEGOB 2011). Table 1 shows the total number

of deaths (from executions and aggressions) by state. As can be seen, Michoacán is the state with the highest number of drug-related executions. Strikingly, this number is almost double the average number of executions in Jalisco (looking at the average of the number of executions in 2007 and 2008), which is the state with the second-highest number of executions. Also, it is important to note that with the exception of San Luis Potosí, there are very few deaths reported in each state resulting from aggressions targeting authorities by organized crime groups.

Additionally, the two dependent variables included in the four separate regressions are a) the total number of trips made by household members to the U.S. and/or Canada and b) the total number of domestic trips made by household members outside their state of residence. A "trip" is defined by the MMP as a visit by an individual outside his/her state or origin that involves either a) work, b) an active job search, or c) a reasonably stable residency (of at least three months) in the new location (MMP). If an individual returns to his/her state of origin, he/she must be there for at least 3 months in order for a subsequent journey to be considered a trip. Additionally, each new visit outside the state will be considered a trip only if a) it coincides with a job change in the target destination, b) the migrant worked in his/her state of origin during his/her stay there, or c) the trip implies a change of residence in the target destination (MMP). These variables were chosen as the dependent variables because if changes in the number of trips made by household members occur the same time as do changes in the level of drug-related violence in a given state, this is a good indication that drug-related violence plays an important role in household migration decisions in Mexico.

Finally, an attempt was made to include state- and time-fixed effects in the empirical model in order to account for differences among the states analyzed, such as distance from the U.S.-Mexico border or economic conditions in each state, as well as differences from year to year that could have an effect on a household-level migration decision. However, due to multicollinearity, only a dummy variable for Jalisco could be included.

Table 2 contains the summary statistics of all the variables I will include in my analysis, including both the independent and dependent variables. As is shown in the table, the mean total number of trips made by members of Mexican households is less than one for each dependent variable, with the mean number of trips to the U.S. and/or Canada about 0.28 trips higher than the mean number of domestic trips. In a real-world sense, an average of 0.721 trips to the U.S./Canada is extremely low. As for the independent variables, it is clear from Table 2 that there are, on average, far more drug-related executions per state in a given year than there are deaths from aggressions targeting authorities. The number of executions also has a much larger standard deviation than that of the variable representing deaths from aggressions, so there is much more variation in executions among the six states studied than there is in deaths from aggressions. Other notable statistics are that about 88% of households have running water, about 90% of households have sewage, and more than half of households own a vehicle. Therefore, one could argue that, on average, the households included in this analysis at least have certain basic amenities (like running water and sewage), so they are unlikely to be living in extreme poverty.

IV. METHOD

An Ordinary Least Squares (OLS) regression model is used in order to examine the relationship between drug-related violence in Mexico and Mexican households' decisions regarding migration. This empirical approach is appropriate because a linear regression allows us to test the effect a change in one variable has on another variable (Stock and Watson 2011), and this paper seeks to identify what effect a change in the level of drug violence has on household-level migration decisions. More specifically, the purpose of this paper is to look at how the number of drug-related executions and deaths from aggressions targeting authorities in a given state is related to a) the number of trips made by household members from that state to the U.S./Canada and b) the number of trips made by household members from that state to another state.

This empirical approach makes it possible to estimate of the slope of the lines relating the each of the drug-related violence variables to each of the two migration-related variables. By estimating these slopes, one can see how strong the relationship is between the independent and dependent variables. Furthermore, applying a linear regression model with multiple regressors allows for the inclusion of control variables that could potentially have an impact on the dependent variables. By including these variables and thereby eliminating any potential omitted variable bias (Stock and Watson 2011), it is possible to determine the true marginal effects that drug-related executions and deaths from aggressions targeting authorities have on the number of trips made by Mexican household members.

After running four separate regressions for each of the four hypotheses, results from t-tests of the null hypotheses (that the coefficients on the key independent drug-violence variables equal zero) will reveal whether drug-related executions and/or deaths from aggressions targeting authorities have a statistically significant impact on the number of domestic and/or international trips made by members of Mexican households. The alternative hypotheses in all four cases are that the coefficients on the two key drug-related independent variables are statistically significantly greater than zero.

V. RESULTS

This paper sought to analyze whether the recent surge in drug-related violence in Mexico has had an impact on Mexican households' migration decisions. Four key hypotheses were tested:

1a.) An increase in the number of *drug-related executions* in a particular state results in a higher total number of reported trips to the U.S./Canada made by the members of households within that state.

1b.) An increase in the number of *deaths from drug-related aggressions* targeting authorities in a particular state results in a higher total number of reported trips to the U.S./Canada made by the members of households within that state.

2a.) An increase in the number of *drug-related executions* in a particular state results in a higher total number of reported *domestic* trips to a different Mexican state by the members of households within the original state.

2b.) An increase in the number of *deaths from drug-related aggressions* targeting authorities in a particular state results in a higher total number of reported *domestic* trips to a different Mexican state by the members of households within the original state.

The results from the four regressions corresponding to these hypotheses are included in Tables 3 through 6, respectively.

As can be seen in Tables 3 and 4, both key independent variables related to drug violence (executions and deaths from aggressions), have a statistically significant impact on the total number of trips made by Mexican household members to the U.S. and/or Canada. In both cases, the coefficient on the drug-violence variables are statistically significant at the 1% level and therefore, we can reject the null hypotheses that drug-related executions and deaths from aggressions have no effect on the number of trips made by Mexican household members to the U.S. and/or Canada. Instead, executions and deaths from aggression targeting authorities are shown to result in more migration: household members make more trips to the U.S./Canada as the number of drug-related executions and deaths from aggressions rises. The positive coefficients on the variables representing drug-related violence are consistent with the literature that posits that higher levels of violence are correlated with a greater amount of internal and international migration (Stanley 1987; Morrison 1993; Ríos 2011; Mesnard 2009).

As shown in Tables 5 and 6, as was found with the first two regressions, the coefficients on both key independent variables related to drug violence are statistically significant at the 1% level, although, in this case, they have a significant impact on the number of *domestic* trips made by Mexican household members, rather than the number of trips to the U.S. and/or Canada. Again, we are able to reject the null hypotheses, which are, in this case, that drug-related executions and deaths from aggressions have no effect on the number of trips made by Mexican household members to other Mexican states. As was the case with the first two regressions, an

increase in the number of drug-related deaths (from executions or aggressions targeting authorities) corresponds to an increase in the number of trips made by Mexican households.

It is worthwhile to point out that, as was expected, the coefficient on drug-related executions is higher than the coefficient on deaths from aggressions for both the regression that uses U.S/Canada trips as the dependent variable and the regression that uses domestic trips as the dependent variable. This makes intuitive sense because an individual will likely feel a greater urge to move away from home if he/she feels his/her life is at risk than if he/she only sees that authorities are being targeted by members of drug cartels.

Out of the four regressions used in this analysis, the first regression, which includes drug-related executions as the independent variable and the number of trips to the U.S./Canada as the dependent variable, is the regression containing the key independent variable (in this case, the number of drug-related executions) with the largest coefficient: 0.0129. This number means that, given the sample data set, it is estimated that an increase of 100 drug-related executions in a given state in a given year will result in household members from that state making about 1.3 more trips to the U.S./Canada, on average. In terms of magnitude, an increase of 1.3 trips by the average household is not very large. Furthermore, given the number of executions reported in the six states studied, an increase by 100 of the number of drug-related executions is extremely large. Only half of the states analyzed reported more than 100 instances of drug-related executions in a single year. As a result, it would be highly unlikely for the number of executions in a state to go up by such a large number; in the case of Morelos, an increase of 100 executions is equivalent to a 588% increase in the number of executions reported in 2007. Therefore, although the coefficient on the drug-related executions variable is statistically significant at the 1% level, the magnitude of the impact that this form of drug violence has on household migration decisions is not large in a real-world sense.

Another interesting finding is that with the first regression (Table 3), the variables which controlled for determinants of migration other than drug-related violence were all statistically significant, with the exception of the age of the head of household. Most of these control variables were significant at the 1% level. These variables controlled for general violence, human capital, household composition, and wealth. Thus, the fact that these variables are statistically significant implies that these factors, in addition to the number of drug-related executions, continue to play an important role in Mexican household migration decisions. This is consistent with the literature citing the key factors, such as socioeconomic variables and human capital that play a role in migration decisions (Ríos 2011; Mendoza 2008). Therefore, even if members of Mexican households feel threatened by the violence in their communities and/or states, they will still factor economic considerations into their decision on whether or not to migrate. However, it is important to note that in Tables 4 through 6, although the drug-violence related independent variables remained statistically significant at the 1% level, the majority of the control variables, which are statistically significant in the first regression, are no longer statistically significant at any conventional level. It comes as a surprise that these socio-economic determinants of migration are no longer statistically significant; Morrison (1993) finds in his study on Guatemala that although the effect of violence on migration generally increases as the prevalence of violence increases, economic factors continue to remain important determinants of migration. Therefore, one would expect that commonly cited factors promoting migration, such as those related to education and household wealth, would remain statistically significant even in the presence of rising violence in Mexico.

Next, both time fixed effects and the dummy variable for Jalisco[1] were statistically significant at the 1% level. The statistical significance of the time fixed effects indicates that excluded or immeasurable variables that change from year to year have an impact on household migration decisions in Mexico. As for Jalisco, the fact that the coefficient on this dummy variable is positive and statistically significant shows that certain state characteristics of Jalisco make households in that state more likely to make trips to the U.S. and/or Canada. For example, factors such as the quality of law enforcement or the level of corruption in the judicial system could make civilians more fearful of drug-related executions because they do not feel protected by authorities.

Furthermore, the explanatory power of the entire set of variables is much lower in the last three regressions than it was in the first regression: in each case the R^2 for these regressions is almost half of what it is when the number of U.S./Canadian trips is the dependent variable and executions is the independent variable. Therefore, although the number of drug-related executions and deaths from aggressions has the anticipated positive impact on the number trips made by household members, the variables, as a whole, do not appear to have as much explanatory power in the last three regressions. A potential explanation for the statistical insignificance of many of the control variables in these last three regressions is that, for the two regressions using trips within Mexico as the dependent variable, differences across states, such as in the availability of jobs, may not be substantial enough to make the benefits of migrating to another Mexican state outweigh the emotional, physical, and financial costs of moving. Therefore, if household members decide whether or not to migrate based on a cost-benefit analysis, they will not migrate. As for the regression using deaths from aggressions as the independent variable and trips to the U.S and/or Canada as the independent variable, because the only difference between this regression and the first one is the choice of the key independent variable, we can assume that the explanatory power of the second regression is lower than that of the first because deaths from aggressions targeting authorities do not sway individuals to migrate as much as do drug-related executions.

In summary, after testing the four hypotheses, the results show that in all cases, an increase in number of deaths resulting from executions and/or aggressions targeting authorities has a positive and statistically significant effect on Mexican household members' decisions to migrate. Given the empirical evidence, all four null hypotheses are rejected in favor of the alternative hypotheses. The number of drug-related executions and deaths from aggressions has a statistically significant effect at the 1% level on both domestic and international migration, and therefore, these two drug violence-related variables have a clear, considerable impact on Mexican household migration decisions. Provided that the number of drug-related executions and deaths from aggressions are a good measure of the severity of drug-related violence in Mexico, the results support the theory that an increase in drug-related violence in Mexico has a positive impact on Mexican households' decisions to migrate.

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[1] An attempt was made to include state fixed effects in the regression for all six Mexican states included in my analysis, but doing so resulted in the omission of certain variables due to multicollinearity. It was also not possible to include 4, 3, or even 2 state dummies in the regression without causing multicollinearity; therefore, only one state dummy (for Jalisco) was included. Due to the imperfect nature of the data used (it is not a balanced panel) the data was treated as cross-sectional rather than panel data, and this caused problems when it came to including state and year fixed effects.

VI. CONCLUSIONS AND POLICY IMPLICATIONS

Given the recent upsurge in drug-related violence in Mexico, combined with the steady flow of Mexican migrants into the United States, this paper attempted to ascertain the relationship between drug-related violence in Mexico and Mexican household migration-related decisions. This paper sought to gain greater insight into the factors that, at this point in time, are most important in prompting Mexican migration. After running four separate OLS regressions modeling the connections between two forms of drug-related violence (drug-related executions and deaths from aggressions targeting authorities) and two forms of migration (domestic migration and international migration to the U.S. and/or Canada), tests of the coefficients on the key independent drug violence-related variables proved that these variables do, indeed, have a statistically significant and positive impact on the number of trips made by Mexican household members, both to the U.S./Canada and to other states within Mexico. Therefore, provided that these independent variables were good stand-ins for the level of drug violence in Mexico, it can be argued that the recent increase in the level of drug-related violence in Mexico is resulting in more Mexicans sending members of their households to either another state in Mexico or to the U.S. and/or Canada. Additionally, the statistical significance of drug-related related variables supports the argument that Mexican household's migration-related decisions cannot be understood entirely using solely a cost-benefit monetary analysis.

U.S. policymakers should gather from this paper's findings that policies they endorse to stop the flow of undocumented workers from Mexico to the United States will largely be unsuccessful unless the policies include measures to reduce the level of drug-related violence in Mexico. Simply increasing border control and deporting undocumented workers will likely not put an end to Mexicans attempts to cross the border into the U.S. if violence continues to disrupt the everyday lives of innocent Mexican citizens. Therefore, helping Mexico's government and law enforcement tackle the issue of drug trafficking and taking away power from criminal drug cartels would be a worthwhile endeavor.

Although this study focused on only six Mexican states in the years 2007, 2008, and 2010, the findings presented give support to the theory that drug-related violence, in general, encourages individuals to migrate. Ideally, this paper would have used data coming from all 31 Mexican states and the Federal District, and would cover the years 2006 through 2011. With more data and more variation in the independent variables, stronger conclusions can be drawn on the general effect of drug violence on household migration decisions within Mexico. Additionally, although this paper treated the final data set as cross-sectional data, in the future, using panel data, in which states report drug-related killings each year, would provide greater variation and would allow for the inclusion of time and state fixed effects. Including state fixed effects is very important because individuals living in states closer to the Mexico-U.S. border most likely have a much greater propensity to migrate to the U.S. than do individuals living in a central or southern state in Mexico. Also, variables such as those related to the quality of U.S. border patrol, immigration laws affecting Mexican immigrants, and Mexican migrant networks, would be valuable additions to this type of analysis, because Mexican households likely take these factors into consideration when making migration-related decisions. Finally, future studies may want to use a new dependent variable in the analysis: the number of attempts to cross the U.S.-Mexico border by Mexican household members. This regression might yield different results than those found in the four regressions from this analysis because this analysis uses dependent variables which assume the Mexican migrant was actually able to cross the border

into the U.S. *and*, if undocumented, avoid deportation for at least three months. Therefore, looking at the number of attempts made by Mexican household members to cross the border may be a better indicator of the how drug violence affects Mexican households' migration-related decisions.

APPENDIX: Tables

TABLE 1:
DRUG-RELATED DEATHS BY STATE AND YEAR

STATE	YEAR	EXECUTIONS	DEATHS FROM AGGRESSIONS TARGETING AUTHORITIES
Morelos	2007	**17**	**1**
Veracruz	2007	**48**	**0**
Jalisco	2007	*93*	*0*
Jalisco	2008	*149*	*0*
Jalisco[a]	------	**121**	**0**
Michoacán	2008	**234**	**4**
San Luis Potosí	2010	**102**	**14**
Guanajuato	2010	**50**	**3**

[a] Because data was gathered in Jalisco in both 2007 and 2008, the number of executions and the number of deaths resulting from aggressions in 2007 and 2008 were averaged to get the mean number of executions per year in Jalisco. The mean is rounded to the nearest whole number.

TABLE 2:
SUMMARY STATISTICS OF ALL KEY VARIABLES

VARIABLES	MEAN	S.D.[a]
Dependent Variables		
total # of U.S./Canada trips made by HH members	0.721	1.808
total # of domestic trips made by HH members	0.441	1.256
Independent Variables		
# of executions in a given state in a given year	92.73	69.05
# of deaths from aggressions targeting authorities in a given state in a given year	2.62	4.53
# of rapes in a given state in a given year	521.39	262.77
# of workers in household (HH)	2.40	1.64
# of HH members	4.12	1.71
sex of HH head (=1 if female)	0.114	0.318
age of HH head	49.75	15.12
# of years of education of HH head	7.16	4.48
running water in HH (=1 if yes)	0.877	0.328
sewage in HH (=1 if yes)	0.902	0.298
HH owns business in Mexico (=1 if yes)	0.300	0.458
dirt floors in HH (=1 if yes)	0.023	0.148
cement floors in HH (=1 if yes)	0.414	0.493
finished floors (tile, carpet, etc.) in HH (=1 if yes)	0.560	0.497
HH owns a vehicle (=1 if yes)	0.535	0.499
n[b] = 2215		

[a] Standard Deviation
[b] number of observations (the number of households surveyed)

TABLE 3
IMPACT OF DRUG-RELATED EXECUTIONS ON MEXICAN HOUSEHOLD MIGRATION
(Total # of Trips to US and/or Canada by Household (HH) Members)

Variables		Coefficients (Std. Errors)	T-Stat	P-Value
# of Drug-Related Executions		0.0129*** (0.00168)	7.68	0.000
# of Rapes		-0.00071*** (0.00018)	-4.07	0.000
# Workers in HH[a]		0.0917*** (0.031)	2.97	0.003
# Members of HH[a]		0.0745*** (0.0252)	2.96	0.003
Years of Education of Head of HH[a]		-0.335*** (0.0084)	-3.99	0.000
Sex of Head of HH (female=1)[a]		-0.294*** (0.097)	-3.03	0.002
Age of Head of HH[a]		0.0021 (0.0029)	0.70	0.481
Running Water in HH (=1)[a]		-0.410*** (0.151)	-2.71	0.007
Sewage in HH (=1)[a]		-0.283* (0.153)	1.85	0.064
HH Owns a Business in Mexico (=1)[a]		-0.175** (0.0857)	-2.04	0.041
HH has Mud Floors (=1)[a]		-0.619*** (0.134)	-4.61	0.000
HH has Cement Floors (=1)[a]		-0.179** (0.0837)	-2.14	0.032
HH owns a vehicle(s) (=1)[a]		0.446*** (0.0851)	5.24	0.000
Dummy for year 2007 (=1)[a]		0.882*** (0.145)	6.07	0.000
Dummy for year 2008 (=1)[a]		-1.479*** (0.257)	-5.75	0.000
Dummy for state of Jalisco (=1)[a]		0.751*** (0.165)	4.55	0.000
R²	0.1083			
Observations (# of Households)	2215			

NOTES:
- Joint significance tests of both a) the year fixed effects dummies and b) the floor type dummies showed year fixed effects to be statistically significant at the 1% level (p-value of 0.0000) and floor type to be statistically significant at the 1% level (p-value of 0.0002).
    - * means the variable is statistically significant at the 1% level.
    - ** means the variable is statistically significant at the 5% level.
    - *** means the variable is statistically significant at the 10% level.
- [a] these control variables were used in all four regressions but are only shown in this particular table

TABLE 4

IMPACT OF DEATHS FROM AGGRESSIONS TARGETING AUTHORITIES BY ORGANIZED CRIME GROUPS ON MEXICAN HOUSEHOLD MIGRATION
(Total # of Trips to US and/or Canada by Household (HH) Members)

Variables		Coefficients (Std. Errors)	T-Stat	P-Value
# of Deaths from Aggressions		0.0737*** (0.0164)	4.49	0.000
# of Rapes		-0.000148 (0.000165)	-0.90	0.369
R²	0.0730			
Observations (# of Households)	2215			

NOTES:
- The control variables presented in Table 3 were all included in this regression, but to simplify this table, they are not presented
- * means the variable is statistically significant at the 1% level.
  ** means the variable is statistically significant at the 5% level.
  *** means the variable is statistically significant at the 10% level.

TABLE 5

IMPACT OF DRUG-RELATED EXECUTIONS ON MEXICAN HOUSEHOLD MIGRATION

(Total # of Domestic Trips to another Mexican State by Household (HH) Members)

Variables		Coefficients (Std. Errors)	T-Stat	P-Value
# of Drug-Related Executions		0.00530*** (0.00126)	4.20	0.000
# of Rapes		-0.000344*** (0.000095)	-3.62	0.000
R^2	0.0773			
Observations (# of Households)	2215			

NOTES:
- The control variables presented in Table 3 were all included in this regression, but to simplify this table, they are not presented
- * means the variable is statistically significant at the 1% level.
  ** means the variable is statistically significant at the 5% level.
  *** means the variable is statistically significant at the 10% level.

TABLE 6

IMPACT OF DEATHS FROM AGGRESSIONS TARGETING AUTHORITIES BY
ORGANIZED CRIME GROUPS ON MEXICAN HOUSEHOLD MIGRATION
(Total # of Domestic Trips to another Mexican State by Household (HH) Members)

Variables		Coefficients (Std. Errors)	T-Stat	P-Value
# of Deaths from Aggressions		0.0387*** (0.00949)	4.08	0.000
# of Rapes		-0.00010 (0.000095)	-1.05	0.293
R²	0.0663			
Observations (# of Households)	2215			

NOTES:
- The control variables presented in Table 3 were all included in this regression, but to simplify this table and make it clearer, they are not presented
- * means the variable is statistically significant at the 1% level.
  ** means the variable is statistically significant at the 5% level.
  *** means the variable is statistically significant at the 10% level.

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