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EVA ARCEO GÓMEZ

Drug-Related Violence and Forced Migration from Mexico to the United States

Importante

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• Carretera México Toluca 3655, Col. Lomas de Santa Fe, 01210,
• Álvaro Obregón, México DF, México.
• www.cide.edu

• Dirección de Publicaciones
• publicaciones@cide.edu
• Tel. 5081 4003

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Abstract

When President Felipe Calderón took office he declared a war on drug lords, thus initiating a war of attrition which has claimed more than 40,000 lives in the last 5 years. In this paper I document how this escalation of violence has led Mexicans living close to the northern border to migrate to the United States. Using data from the American Community Survey to estimate migration, and administrative death records to estimate murder rates, I present evidence that the United States southern states have seen the largest increases in Mexican migration from 2005 to 2010. I also show that these new migrants are college educated, which is in high contrast with the archetypical Mexican migrant in the United States. My analysis also shows that there is a correlation between business openings and murder rates in Mexico. I conclude that the war on drugs is making wealthy well-educated Mexicans leave the country, thus diminishing the available skilled labor force and investment needed for future economic development.

Resumen

Cuando el presidente Felipe Calderón tomó posesión le declaró la guerra al narco, iniciando entonces una guerra de atrición que en los últimos cinco años ha cobrado más de 40,000 vidas. En este documento analizo cómo esta escalada en la violencia ha empujado a los mexicanos de la frontera norte a migrar a Estados Unidos. Usando datos del American Community Survey para estimar el influjo migratorio reciente de mexicanos, y datos administrativos de certificados de defunción para estimar las tasas de homicidios, presento evidencia de que los estados de la frontera sur de Estados Unidos han recibido los flujos más grandes de mexicanos debido a la violencia entre 2005 y 2010. También muestro que estos nuevos migrantes tienen estudios universitarios, lo cual contrasta con el típico migrante mexicano en Estados Unidos. Mi análisis también muestra que existe una correlación entre la tasa de homicidios en México y la apertura de negocios en Estados Unidos. En conclusión, la guerra contra el narco está provocando la migración de mexicanos relativamente ricos y muy educados, disminuyendo así la cantidad de trabajo calificado y la inversión disponible en México, las cuales son necesarias para el futuro desarrollo del país.

Introduction

It is a well-known fact that the drug-related violence in Mexico has seen an upsurge in recent years. This increase in violent crimes has been attributed to the so-called “war against drug trafficking” which was declared when President Felipe Calderón took office in 2006. From 2006 to 2010 there have been around 30,000 drug-related deaths in Mexico -10% of which are considered civilian casualties.¹ As a result, Mexicans have been fleeing away from areas where the conflict between drug cartels, or between drug lords and the Mexican army has been more intense. International migration is certainly an attractive option, especially for those living closer to the border. This paper aims at documenting the effect of drug-related violence on Mexican immigration to the United States, as well as characterizing the violence-led immigrants.

The first issue that arises is whether the war on drugs caused an increase on violence in Mexico. Dell (2011) presents rigorous econometric evidence that those municipalities in which the National Action Party (the same as that in the federal government) won close elections are more likely to experience an increase in drug-related homicides. She establishes that those municipalities are more likely to ask for federal or military forces to combat drug lords. This crackdown in turn debilitates the “incumbent drug lord” and generates incentives for rival cartels to fight for the turf. As a result, homicides between members of rival drug cartels increase. She thus concludes that the war on drugs spearheaded by President Calderón and the National Action Party has indeed led to an upsurge in drug-related murder rates.

Previous literature has shown that violence caused by civil conflicts forces people to migrate to safer locations. This review of the literature will focus on Latin American case studies. Morrison (1993) studied whether violence from politically motivated conflicts is a determinant of migration in addition to economic factors in neoclassical economic models of migration. He found that between 1976 and 1981, violence has a positive effect on Guatemalan migration, and moreover that escalating violence increases the magnitude of this effect: the more violence there is, the greater is the effect of violence on migration. Morrison and May (1993) also find a link between migration and political violence in Guatemala. Lundquist and Massey (2005) find a strong relation between Nicaraguan out migration to the United States and the Contra war. Alvarado and Massey (2010) study the relationship of violence and migration from the perspective of world systems theory, and linking economic openness to a rise in criminality. Using data from 1979 to 2003, they find a positive effect of violence on migration only in Nicaragua, but not in Mexico,

¹ As of October 2011, the Drug Enforcement Administration estimated that 43,000 casualties related to the Mexican drug war (Otero 2011).

Costa Rica and Guatemala. Finally, Wood *et al.*, (2010) find evidence that crime victimization in Latin America induces people to seriously think about moving to the United States.

The Colombian case is particularly interesting since it shares many characteristics with the Mexican experience, despite having its origins on political opposition. There is evidence that crime and violence forced Colombians to migrate to safer locations within Colombia (Engel and Ibáñez, 2007; Ibáñez and Vélez, 2008; Lozano-Gracia *et al.*, 2010). On their part, Rodríguez and Villa (2011) find evidence that the risk of kidnap induces households to send some of their members to an international destination. They also find that wealthier households are at greater risk of becoming kidnap victims.

Therefore it is not surprising that Mexicans exposed to drug-related violence are fleeing away from the conflict zones and that they are finding in the United States a safe haven. This phenomenon has been publicized in the American news media: the US cities in the southern border have seen a relative increase of middle-class Mexican migration. These new migrants have established new businesses in the United States (Becker, 2009; Campoy, 2009; Garza, 2009; Sheridan, 2011), and are therefore different from the archetypical Mexican migrants.

To my knowledge there is no paper documenting this forced migration all across the US-Mexico border. This paper attempts to fill this gap in the literature. The objective of the paper is twofold. First, it will provide evidence of the changes in demographics along the US-Mexican border. Using data from Mexican administrative records of death certificates and the American Community Survey (ACS) from 2000 to 2010 I will document how the upsurge in violence, as measured by homicide rates, led to an increase of immigrants in the southern border states of the United States.

The border region will be the focus to this study because the war on drugs has affected more than proportionately the northern states in Mexico, particularly the border cities. Another reason to focus in the border region is that migration into the border cities in the United States is facilitated by the fact that Mexicans holding a Border Crossing Card can cross the border and travel up to 25 miles into the United States –and 75 miles into Arizona–without the need of an I-94. This variation in the traveling limits will allow me to compare changes in the Mexican migrants' characteristics between cities close to Mexico to those cities which are apparently "off limits".

The paper will also document if there are changes in the openings of business in the counties along the US border using data from self-employment in the ACS and data from the Country Business Patterns. The working hypothesis in this case is that Mexican migrants transfer their businesses to the United States or that they simply open businesses in the U.S. to make a living.

Using both a descriptive analysis and econometric estimations, we find that the upsurge in violence in Mexico did produce an increase in college-educated immigrants to the states in the southern U.S. border, and there is evidence of a correlation with business openings in the United States; hence, the immigrants' investments was not limited to the southern border states. These findings suggest that drug-related violence in Mexico did produce a change in the type of immigrants from Mexico to the United States. These findings have very important implications for Mexico and the United States. The fact that college-educated immigrants, who are willing to invest in businesses, are fleeing the country entails a loss of both human and physical capital. According to growth theories (Mankiw, Romer and Weil, 1992; Roemer, 1990; Solow, 1956), these two types of investments are the main inputs for economic development. Hence, if the strategy against drug trafficking continues through this violent path, Mexico's economic growth will be eventually hampered.

The rest of the paper is organized as follows. Section 1 describes the data sources used in the analysis as well as the construction of some key variables. Section 2 documents the upsurge in homicides in Mexico, as well as the changing dynamics of migration to the United States along the southern border. Section 3 presents the econometric analysis. Finally section 4 discusses the results and concludes.

1. Data

In both the descriptive and econometric analysis we use data from many different sources. We use the causes of death in death certificates to tally the homicides in Mexico. Those administrative records have information on the exact date of death; municipality and state of residence of the deceased; cause of death described using the 10th version of the International Classification of Diseases;² age, gender and other socio-demographic characteristics. Given the topic of interest we only took into account those deaths of people 15 or more years of age. We also estimated homicides for two age groups of interest: those between 15 and 24 years old, and those between 25 and 44 years old.

The homicides rates were estimated as the number of homicides in a municipality over 100,000 inhabitants in the group of interest of that municipality. The population tallies were estimated using the 2000 and 2010 Mexican Censuses of Population, and the 2005 Population Count. The population for the years between surveys was extrapolated using a constant population growth rate.

² In particular, homicides are classified using the X85 to Y09 codes, which described assault inflicted with different objects, substances or actions.

Given that our main interest relies on the drug-related violence close to the border, the homicide rates were geo-referenced.³ The geographical data was obtained from Mexico's National Statistics Institute (INEGI for its Spanish acronym).⁴ In order to estimate the degree of exposure of US counties to Mexican migrants fleeing from violence, we constructed a weighted homicide rate, where the weights were given by the square root of the distance between US counties and Mexican municipalities. The geographical coordinates of US counties were obtained from the Census Bureau.⁵ We assumed that those counties farther than 500 kilometers from a Mexican municipality were not exposed to this kind of Mexican migration.

The characterization of immigrants in the United States was done using the 2000 Census of Population and the 2005 to 2010 American Community Surveys.⁶ These surveys have information on socio-demographic characteristics, work behavior and job characteristics, country of birth, year of immigration, and much more. The descriptive analysis will use recent migrants; that is, those who have been in the United States during the last 5 years or less. The econometric analysis will focus on immigrants who arrived in the last year. That way we will be better enabled to relate immigration to violence in the last year.

Finally, the data on businesses comes from the County Business Patterns series compiled by the Census Bureau.⁷ These series have data on the number of business establishments in US counties since 1986. The dataset has information on the industry of the establishment, total number of establishments, and number of establishments by employment-size classes. Unfortunately, the data does not specify whether the business belongs to an immigrant.

2. Violence and Changes in Mexican Immigration

We will first document the rise in homicide rates in Mexico. Figure 1 presents the trends in homicide rates since 2000. Each of the panels in the figure compares homicide rates according to how close they are to the border. Panel A compares the municipalities in the northern-border states (denoted with a 1) with those in non-border states (denoted by 0). It is easily verifiable that there has been a marked increase in the homicide rates all over Mexico since 2008, but particularly in the northern-border states: by 2010 the mean homicide rates in the northern states was about 37 homicides per 100,000

³ I would like to thank Gabriel Parada for his help georeferencing the data and estimating the distance to the border.

⁴ <http://www.inegi.org.mx/geo/contenidos/geoestadistica/catalogoclaves.aspx>

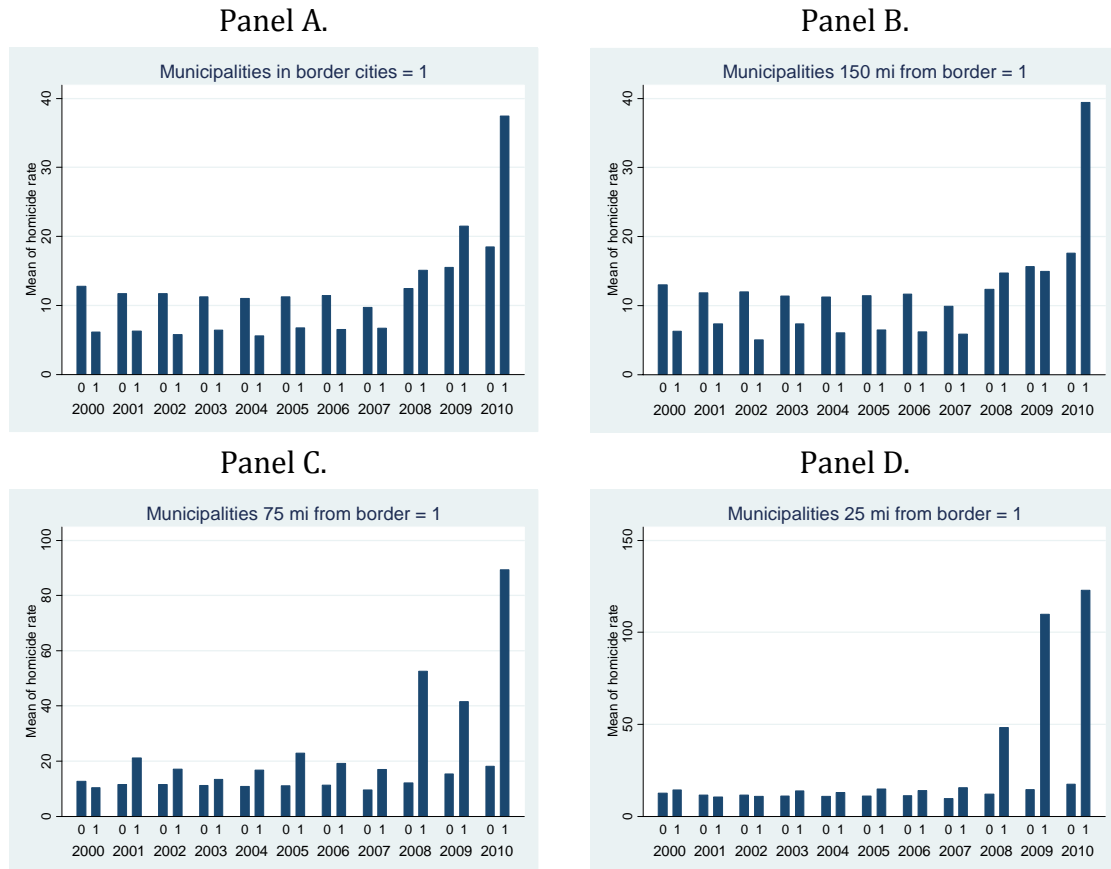
⁵ <http://www.census.gov/tiger/tms/gazetteer/county2k.txt>

⁶ <http://usa.ipums.org/usa/>

⁷ <http://www.census.gov/econ/cbp/index.html>

people, whereas in the rest of the country it was around 21 homicides per 100,000 people.

FIGURE 1. TRENDS IN HOMICIDE RATES ALONG THE MEXICO-US BORDER



Source: Author's estimations using data from death certificates and the Mexican Census of Population for various years.

Panel B, C and D in Figure 1 look more closely at the homicide rates in municipalities near the border. The trend observed in Panel A is mostly dominated by the violence exerted in municipalities closer to the border. Panel B compares municipalities in a radius of 150 miles from the border, Panel C in a radius of 75 miles, and Panel D in a radius of 25 miles. As we get closer to the border the homicide rates show an increasing pattern since 2008. For instance, Panel D shows that municipalities within 25 miles from the border have a homicide rate of around 125 homicides per 100,000 people, while the rest of the municipalities in Mexico exhibit a homicide rate of less than 25. That is, the mean homicide rate in "border municipalities" is more than 5 times higher than the mean homicide rate in the rest of the country in

2010. Moreover, the mean homicide rate in these “border municipalities” has seen a tenfold increase since 2000.

Given these figures, it is not surprising that Mexicans are fleeing away from the border area. According to Mexico’s Census of Population figures, in 2000 only about 9.5% of Mexicans migrating within the country came from border states: Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas. By 2010, almost 24% of Mexico’s internal mobility was originated in the border states. Unfortunately, the census does not allow us to identify households that migrated to the United States. In order to characterize those immigrants, we will first present descriptive statistics of Mexican immigrants in the United States using data from the 2000 US Census of Population, and the 2005 and 2010 American Community Surveys.

TABLE 1. CHARACTERISTICS OF MEXICAN IMMIGRANTS: BORDER VS. NON-BORDER STATES

	Non-border states			Border states		
	2000	2005	2010	2000	2005	2010
Age: 0 to 20	0.3742	0.2891	0.2613	0.4158	0.3552	0.3136
Age: 21 to 35	0.4946	0.5350	0.5476	0.4388	0.4766	0.4362
Age: 36 to 64	0.1035	0.1387	0.1535	0.1012	0.1264	0.1600
Female	0.3757	0.3870	0.4088	0.4468	0.4422	0.4734
Married	0.3836	0.4138	0.3534	0.3714	0.4093	0.3583
Self-employed	0.0272	0.0351	0.0499	0.0554	0.0786	0.0787
Salaried	0.9728	0.9649	0.9501	0.9446	0.9214	0.9213
Secondary	0.2457	0.3095	0.2992	0.1953	0.2277	0.2342
High School	0.0358	0.0412	0.0466	0.0337	0.0400	0.0638
College	0.0331	0.0357	0.0426	0.0268	0.0358	0.0589

Notes: Author’s estimates using the 2000 U.S. Census of Population, and the 2005 and 2010 American Community Surveys. All quantities represent proportions of the characteristic specified.

Table 1 presents descriptive statistics of recent Mexican immigrants in the United States. Here recent immigrants are defined as those who migrated less than 5 years prior to the survey. The first trend that stands out is that Mexican migrants are older in 2000 than they were in 2010. Mexicans in the southern border states (California, Arizona, New Mexico and Texas) have a different age structure than those in the rest of the U.S.: they tend to be underage or between 36 and 64 with a higher proportion. We also find that a higher proportion of immigrants are females over time. Surprisingly, and contrary to the anecdotal evidence telling that wealthy *families* are the ones fleeing violence, over time less migrants were married in 2010 than in 2005, and the border exhibits only a slightly higher proportion of married immigrants.

One of the recurring arguments in the media is not only that wealthy families are migrating, but that they are establishing businesses or otherwise investing in the United States. In order to find evidence of that, Table 1 also presents the proportion of self-employed immigrants. This proportion has increased since 2000, and it has always been higher in the border states. However the proportion increased by more in non-border states than in border states suggesting that businessmen are in fact establishing their economic activities away from the border and not in the border cities as the media suggests.

Another way to find evidence of a wealthier-than-average immigrant is to look at the educational structure. The last three rows in Table 1 present the proportion of immigrants with secondary schooling, completed high school and whether they attended college or more. The statistics present evidence that immigrants are now better educated than in 2000, but also that there was a large influx of college educated immigrants in the border states. So at least in the border, we do find some evidence of a changing face of Mexican immigrants.

Table 2 presents the same descriptive statistics for Mexicans living in the southern border states by distance to the border. We find that the population of Mexican migrants in those areas is getting older, but more so the closer they live to the border. A larger percentage of migrants are female as we move towards the border. These figures are strikingly different to those found in non-border states: the percentage of female migrants in counties within 25 miles from the border is larger than 50% in 2010, whereas it is only around 40% in non-border states that same year. The percentage of self-employed increased more in those counties within 75 miles from the border, but the increase is still lower than that observed in non-border states. Finally, we find evidence that Mexican immigrants living closer to the border are much better educated suggesting that wealthier-than-average Mexicans did migrate close to the border after 2005.

TABLE 2. CHARACTERISTICS OF MEXICAN MIGRANTS LIVING IN BORDER STATES BY DISTANCE TO THE BORDER

Within	150 miles from border		75 miles from border		25 miles from border	
	2005	2010	2005	2010	2005	2010
Age: 0 to 20	0.3509	0.3299	0.3437	0.3084	0.3741	0.2953
Age: 21 to 35	0.4760	0.4077	0.5270	0.4199	0.3815	0.3625
Age: 36 to 64	0.1281	0.1545	0.1049	0.1703	0.1733	0.2160
Female	0.4571	0.4859	0.4027	0.4578	0.4940	0.5276
Married	0.3958	0.3304	0.4352	0.3861	0.4836	0.4112
Self-employed	0.0958	0.0921	0.0741	0.0962	0.1311	0.1307
Salaried	0.9042	0.9079	0.9259	0.9038	0.8689	0.8693
Secondary	0.2435	0.2325	0.2632	0.2442	0.2253	0.2009
High School	0.0404	0.0638	0.0355	0.0551	0.0586	0.0884
College	0.0307	0.0551	0.0232	0.0623	0.0668	0.1168

Notes: Author's estimates using the 2000 U.S. Census of Population, and the 2005 and 2010 American Community Surveys. All quantities represent proportions of the characteristic specified.

Table 3 estimates the growth rates in the number of business establishments and compares southern border states with the rest of the country. According to those figures, the growth rate of business establishments has indeed been larger in border-states than the rest of the United States. The growth rate of businesses in the border has been more than 50 percentage points higher, despite the effects of the Global Recession of 2008. The businesses that exhibit the largest growth rates are those which employ between 10 and 19 workers, then those who employ between 20 to 49 people, and finally those who employ between 5 to 9 workers. So the businesses that are growing the most are not the smallest employment-size category.

TABLE 3. GROWTH RATES IN THE NUMBER OF ESTABLISHMENTS

Growth rates (%)	Non-border states		Border states	
	2005	2009	2005	2009
Number of establishments	1.5991	-0.3453	1.9140	0.2776
By employment size:				
Establishments: 1 to 4	2.2106	-0.4494	2.6715	0.1006
Establishments: 5 to 9	0.8644	-0.3075	1.2246	0.4493
Establishments: 10 to 19	1.2393	0.1084	1.2209	0.9565
Establishments: 20 to 49	0.7586	-0.0753	0.8535	0.5629

Source: Author's estimates using County Business Patterns data series.

Finally, Table 4 compares the growth rates of number of establishments of counties which are closer to the border. According the table, the growth rate of the total number of establishments is the largest in the counties within 75 miles from the border. However, the establishments which employ between 20 and 49 workers grew more in the counties within 25 miles from the border. We conclude that the number of establishments in the border states in general, and those closer to the border in particular, grew more than in the rest of the country, even during the years of the Global Recession of 2008.

TABLE 4. GROWTH RATES IN THE NUMBER OF ESTABLISHMENT IN BORDER STATES

Growth rates (%)	Within:					
	150 mi. from border		75 mi. from border		25 mi. from border	
	2005	2009	2005	2009	2005	2009
Number of establishments	2.7698	-0.1066	3.6473	0.7176	2.6416	0.3315
By employment size:						
Establishments: 1 to 4	3.7894	-0.1240	4.5158	0.8171	3.3226	0.1186
Establishments: 5 to 9	1.7210	0.0751	2.4448	1.4668	1.8350	0.6419
Establishments: 10 to 19	1.6851	0.4002	2.8767	0.6870	1.8876	1.2155
Establishments: 20 to 49	1.2758	-0.3625	2.5575	0.2742	2.3025	0.3148

Source: Author's estimates using County Business Patterns data series.

3. Econometric Analysis

In order to strengthen the findings of the previous section, we estimated the following regression:

$$Y_{jt} = \alpha + \beta \text{Homicide}_{jt} + \gamma \text{Urate}_{jt} + \delta_j + \mu_t + \varepsilon_{jt}, \quad (1)$$

where Y_{jt} is the logarithm of the outcome of interest in county j and year t ; Homicide_{jt} is the logarithm of homicide rate weighted by distance to Mexican municipalities within 150 miles from the border; Urate_{jt} is the logarithm of the unemployment rate; δ_j are county fixed effects which control for county characteristics that are time-invariant; and μ_t are year fixed effects which control for the overall health of the U.S. economy. At this point it is worthwhile to remember that the weighted homicide rates are measuring the exposure to immigrants fleeing from violence. The working hypothesis in this paper is that immigrants tended to flee to places relatively close to the border, given that this type of migration is “facilitated” by Border Crossing Cards and Mexicans still have easy access to Mexico. The outcomes of interest will be the number of Mexicans who migrated in the year prior to the survey, and the number of business establishments. These outcomes will also be restricted to either migrants’ characteristics or the employment size of the establishment.

Table 5 presents the estimates of equation (1) using the log of the number of Mexican immigrants. Our estimates suggest that the homicide rates caused an increase in the total Mexican immigrants in the United States. We find that a one percent increase in the weighted homicide rates is correlated with an increase of 0.57% of Mexican immigrants. Contrary to what we expected, homicide rates are negatively related to immigration of self-employed Mexicans: a one percent increase in the weighted homicide rates is correlated with a decrease of 0.39% of self-employed Mexican immigrants. We do not find any significant effect of murder rates on immigration of Mexicans categorized by educational levels. The effect of county unemployment rates is negative as expected; that is, the higher the county unemployment rate, the lower is the influx of Mexican migrants into that county.

TABLE 5. EFFECT OF VIOLENCE ON MEXICAN MIGRATION TO THE UNITED STATES

Dependent variable:	Last year's Mexican immigrants				
	Total	Self-employed	Education level		
			College	High School	Secondary
	(1)	(2)	(3)	(4)	(5)
Weighted homicide rate	0.5730*** [0.1730]	-0.3939** [0.1677]	0.1091 [0.1987]	-0.1406 [0.1802]	0.0308 [0.2170]
Unemployment rate	-0.7951*** [0.2510]	0.0054 [0.1155]	-0.2314* [0.1362]	-0.1619 [0.1300]	-0.4432** [0.1965]
Constant	1.0284 [0.6969]	0.5854* [0.3271]	0.0059 [0.3966]	0.2913 [0.3753]	0.5492 [0.5526]
Observations	2,254	2,254	2,254	2,254	2,254
R-squared	0.636	0.447	0.526	0.485	0.561
Year FE	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y

Notes: Dependent and explanatory variables are in logarithms. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

The results found above could be a consequence of spurious correlation between immigration and murder rates. We rule out this possibility by estimating equation (1) using the weighted death rates from internal causes (diseases) as an explanatory variable instead of weighted homicide rates. The results of this estimation are shown in Column (1) of Table 6. As expected, death rates from internal causes are unrelated to Mexican immigrants in the United States.

The results found in Table 5 could also be a result of some counties having better economic conditions than others (where these conditions are somehow correlated to murder rates in Mexico and unmeasured by unemployment rates), and thus attracting immigrants from Mexico, Americans, and immigrants from other countries. Columns (2) and (3) tackle this possibility. We do find a positive correlation between American immigrants and homicide rates in Mexico. Notwithstanding, we do not find any effect of homicide rates in Mexico to immigration from other countries. Finally, we estimate whether the murder rates by age groups of the victims have a differential effect on immigration. We do not find such a differential effect, though both of the coefficients in Columns (4) and (5) are smaller in magnitude than the effect of total murder rates.

TABLE 6. ROBUSTNESS CHECKS

Dependent variable:	Mexican Migrants	American Migrants	Non-mexican Migrants	Mexican Migrants	Mexican Migrants
	(1)	(2)	(3)	(4)	(5)
Death rate (internal causes)	1.4154 [2.2990]				
Homicide rate		0.0281** [0.0124]	0.1225 [0.1771]		
Homicide rate: 15 to 24				0.4618*** [0.1710]	
Homicide rate: 25 to 44					0.5043*** [0.1688]
Observations	2,254	2,254	2,254	2,254	2,254

Notes: Dependent and explanatory variables are in logarithms. Robust standard errors in brackets. The regression also controls for the log of the county unemployment rate, year and county fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Table 7 presents the results of murder rates in Mexico on the number of business establishments in the United States. The results indicate that violence in Mexico has a small, but positive and significant, effect on business establishments: a one percent increase in weighted murder rates in Mexico leads to a 0.01% increase in the number of business establishments in the United States. We find a positive effect for establishments employing up to 19 workers. The results are not however robust to the inclusion of internal death rates instead of homicide death rates (Table 8). There should to be an omitted variable that is correlated to both the murder rates in Mexico and immigration in the United States.

TABLE 7. EFFECT OF MEXICAN VIOLENCE ON THE NUMBER OF BUSINESS ESTABLISHMENTS IN THE UNITED STATES

Dependent variable	Number of business establishments				
	Total	Employment size			
		1 to 4	5 to 9	10 to 19	20 to 49
	(1)	(2)	(3)	(4)	(5)
Homicide rate	0.0109*** [0.0023]	0.0091*** [0.0024]	0.0138*** [0.0041]	0.0136*** [0.0036]	0.0089 [0.0068]
Unemployment rate	-0.0124*** [0.0032]	-0.0033 [0.0036]	-0.0088* [0.0047]	0.0234*** [0.0052]	0.0345*** [0.0059]
Constant	10.6430*** [0.0090]	10.0342*** [0.0101]	9.0090*** [0.0128]	8.5700*** [0.0145]	8.1494*** [0.0164]
Observations	1,880	1,880	1,880	1,880	1,880
R-squared	0.999	0.999	0.999	0.999	0.998
Year FE	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y

Notes: Dependent and explanatory variables are in logarithms. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

Since our working hypothesis establishes that immigrants mostly fled just across the border, we also estimated the following equation:

$$Y_{jt} = \alpha + \beta Homicide_{jt} + \pi Homicide_{jt} \times BorderSt_j + \gamma Urate_{jt} + \delta_j + \mu_t + \varepsilon_{jt} \quad (2)$$

where all variables are defined as it was previously explained, and *BorderSt_j* is an indicator variable that the county is in a southern-border state. The parameter π will identify the difference of the effect of homicides on border states. Given our working hypothesis, we would expect that $\pi > 0$; hence, border states receive more immigrants and open more establishments as a consequence of violence in Mexico.

7 Dependent variable	Number of business establishments				
	Total	1 to 4 (2)	5 to 9 (3)	10 to 19 (4)	20 to 49 (5)
Death rate (internal causes)	(1) 0.1074*** [0.0341]	0.0621** [0.0304]	0.1709*** [0.0488]	0.0904* [0.0502]	0.1815*** [0.0594]
Unemployment rate	-0.0111*** [0.0033]	-0.0025 [0.0036]	-0.0067 [0.0047]	-0.0222*** [0.0053]	-0.0323*** [0.0060]
Constant	10.5901*** [0.0208]	10.0046*** [0.0194]	8.9235*** [0.0295]	8.5271*** [0.0305]	8.0567*** [0.0345]
Observations	1,880	1,880	1,880	1,880	1,880
R-squared	0.999	0.999	0.999	0.999	0.998
Year FE	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y

Notes: Dependent and explanatory variables are in logarithms. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 9 presents the estimates of equation (2). As expected, the coefficient on the interaction term is positive (except for immigrants with high-school education in Column (4), where it is negative, though not statistically significant). In Column (1) we find that an increase of one percent of the weighted homicide rate in Mexico produces an increase of 0.72% on the total immigration of Mexicans to the southern-border of the United States. What is more interesting, however, is the effect of violence on college-educated immigrants: one percent of the weighted homicide rate in Mexico produces an increase of 2.03% on the immigration of college-educated Mexicans in the southern-border states. This last finding is consistent with the hypothesis that wealthier-than-average Mexicans are the ones fleeing violence in Mexico. We do not find a positive effect on the number of immigrants with high school, but we find a positive effect on secondary-educated immigrants.

TABLE 9. EFFECT OF VIOLENCE ON MEXICAN MIGRATION TO U.S. SOUTHERN BORDER STATES

Dependent variable:	Last year's Mexican immigrants				
	Total	Self-employed	Education level		
			College	High School	Secondary
	(1)	(2)	(3)	(4)	(5)
Homicide rate	-0.1398 [0.2062]	-1.0227 [1.2021]	-1.8887 [1.1921]	-0.1099 [1.6735]	-0.4769** [0.1997]
Border dummy * Homicide rate	0.7249*** [0.2548]	0.6395 [1.2138]	2.0315* [1.2072]	-0.0312 [1.6826]	0.5162* [0.2859]
Unemployment rate	-0.7894*** [0.2516]	0.0104 [0.1149]	-0.2154 [0.1362]	-0.1622 [0.1293]	-0.4391** [0.1969]
Constant	1.0448 [0.6983]	0.5999* [0.3255]	0.0519 [0.3962]	0.2906 [0.3738]	0.5609 [0.5531]
Observations	2,254	2,254	2,254	2,254	2,254
R-squared	0.636	0.447	0.527	0.485	0.561
Year FE	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y

Notes: Dependent and explanatory variables are in logarithms. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 10 presents the robustness checks for the estimation of equation (2). We do not find any evidence that the source of our results is merely spurious correlation. The results in Table 10 are more encouraging in the sense that we do not find an effect on the immigration of Americans any more. However, we now find a positive effect on immigration from non-Mexican foreigners all over the United States, with no particular effect on the southern-border states. The relative importance of murder rates by age

groups continues to be smaller in magnitude than the effect of total murder rates in Mexico.

TABLE 10. ROBUSTNESS CHECKS OF MODEL WITH INTERACTIONS

Dependent variable:	Mexican Migrants	American Migrants	Non-mexican Migrants	Mexican Migrants	Mexican Migrants
	(1)	(2)	(3)	(4)	(5)
Death rate (internal causes)	-1.7031				
	[3.3064]				
Border dummy * Death rate (internal causes)	3.1398				
	[4.0206]				
Homicide rate		0.0448	0.3908*		
		[0.0428]	[0.2068]		
Border dummy * Homicide rate		-0.0170	-0.2728		
		[0.0442]	[0.2648]		
Homicide rate: 15 to 24				-0.1308	
				[0.1889]	
Border dummy * Homicide rate: 15 to 24				0.6026**	
				[0.2455]	
Homicide rate: 25 to 44					-0.1780
					[0.2447]
Border dummy * Homicide rate: 25 to 44					0.6899**
					[0.2818]
Observations	2,254	2,254	2,254	2,254	2,254

Notes: Dependent and explanatory variables are in logarithms. Robust standard errors in brackets. The regression also controls for the log of the county unemployment rate, year and county fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Finally, Table 11 shows the estimation of model (2) using the logarithm of number of business establishments as a dependent variable. We find that homicide rates have smaller effect on business in border states than in the rest of the United States. These findings suggest that business openings are not exclusive of border states as the descriptive evidence suggest, but a general trend in the United States. However, we need to have caution with these results. The robustness check using death rate from internal causes is more encouraging (not shown), but it still does not allow us to rule out the presence of omitted variable bias in these estimations.

TABLE 11. EFFECT OF MEXICAN VIOLENCE ON THE NUMBER OF BUSINESS ESTABLISHMENTS IN SOUTHER U.S. BORDER

Dependent variable	Number of business establishments				
	Total	Employment size			
		1 to 4	5 to 9	10 to 19	20 to 49
	(1)	(2)	(3)	(4)	(5)
Homicide rate	0.0223 [0.0143]	0.0080 [0.0122]	0.0545*** [0.0187]	0.0513*** [0.0148]	0.0296* [0.0165]
Border dummy * Homicide rate	-0.0117 [0.0145]	0.0011 [0.0124]	-0.0416** [0.0191]	-0.0386** [0.0151]	-0.0212 [0.0178]
Unemployment rate	-0.0125*** [0.0033]	-0.0033 [0.0036]	-0.0091* [0.0047]	-0.0237*** [0.0052]	-0.0347*** [0.0059]
Constant	10.6428*** [0.0090]	10.0343*** [0.0101]	9.0082*** [0.0128]	8.5694*** [0.0145]	8.1491*** [0.0165]
Observations	1,880	1,880	1,880	1,880	1,880
R-squared	0.999	0.999	0.999	0.999	0.998
Year FE	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y

Notes: Dependent and explanatory variables are in logarithms. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

Conclusions

Discussion and Concluding Remarks

Since President Felipe Calderón took office in 2006, Mexico has been waging a war against drug cartels. The war on drugs has been found to lead to an increase in murder rates. We find that there was tenfold increase in murder rates all across the municipalities within 25 miles of the border between 2006 and 2010. This upsurge in violence has understandably become a powerful reason to flee those unsafe areas in search of a peaceful life. The American media has presented anecdotal evidence of the violence-led diaspora. According to the accounts, Mexicans who had fled the war are wealthier than the prototypical Mexican immigrant. The new immigrants are opening businesses to make a living, or even making huge investments in order to apply for an E-2 visa.

Using both a descriptive and an econometric analysis, this paper documents how violence in the border caused a spur in immigration to the United States, and particularly to the southern-border states. According to our estimates, the Mexican immigration caused by the violence is better educated than the economic Mexican migrants. We do not find however robust causal evidence on business openings or self-employed Mexican immigrants. Our evidence points to a positive correlation between murder rates in Mexico and the number of establishments all over the United States (not exclusively on the southern border).

These results have very important implications for both Mexico and the United States. First, we found college-educated people are fleeing away from violence in Mexico. This type of immigration amounts to a loss of human capital in Mexico, which is still relatively scarce as compared to developed nations. Second, we found that homicide rates are correlated with a boom of businesses and all over the United States. To Mexico, this result means that investment is flying away from Mexico and into the United States. All in all, Mexico is losing both human and physical capital due to the upsurge in violence generated by the war on drugs. According to growth theories in economics, these losses will eventually hamper economic growth in Mexico. Mexico's loss is however the United States' gain.

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