Drug-Related Violence, Forced Migration and the Changing Face Of Mexican Immigrants in the United States

by Eva Olimpia Arceo-Gómez, Centro de Investigación y Docencia Económicas

It is a well-known fact that the drug-related violence in Mexico has seen an upsurge in recent year. 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 immigration to the United States, as well as characterizing the new immigrants.

Previous literature has shown that violence caused by civil conflicts forces people to migrate to safer locations. The Colombian case is particularly interesting since it shares many characteristics with the Mexican experience. Ibáñez and Vélez (2008) have documented that the drug-related crime and violence forced Colombians to migrate to safer locations within Colombia. Wood *et al.* (2010) find evidence that crime victimization in Latin America induces people to seriously think about moving to the United States.

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 U.S. 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; Sheridan 2011), and are therefore different from the archetypical Mexican migrants.

To my knowledge there is no rigorous research documenting this forced migration all across the US-Mexico border. This

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

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. And second, 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 US to make a living.

Data Description

In both the descriptive and econometric analysis we use data from many different sources. Homicide rates are estimated as the homicide cases per 100,000 people in the municipality. Homicide cases come from death certificates and are identified by the cause of death. Population data comes from the 2000, 2005 and 2010 Mexican Census of Population conducted by the National Statistical Institute (INEGI for its Spanish acronym). The population of years in between surveys was estimated using a constant population growth rate. Homicide rates are weighted by the square root of the distance between Mexican municipalities and U.S. counties. Geographical data was obtained from both INEGI and the Census Bureau.

In order to characterize Mexican immigrants in the United States, we use the 2000 Census of Population and the 2005 to 2010 American Community Surveys.[2] Finally, the data on businesses comes from the County Business Patterns series compiled by the Census Bureau.[3]

Violence and Changes in Mexican Immigration

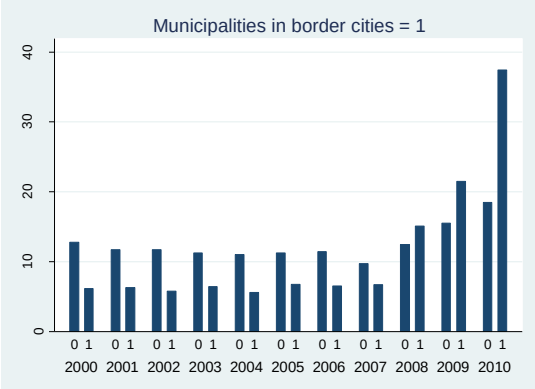
We will first document the rise in homicide rates in Mexico. Figure 1 presents the trends in homicide rates since 2000. Each of the panels in the figure compares homicide rates according to how close they are to the border. Panel A compares the municipalities in the northern-border states (denoted with a 1) with those in non-border states (denoted

[2] http://usa.ipums.org/usa/
[3] http://www.census.gov/econ/cbp/index.html

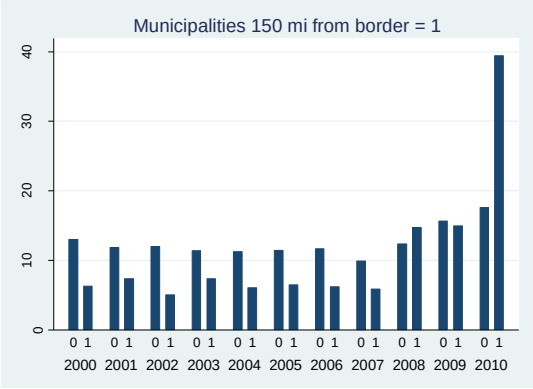
by 0). It is easily verifiable that there has been a marked increase in the homicide rates all over Mexico since 2008, but particularly in the northern-border states: by 2010 the mean homicide rates in the northern states was about 37 homicides per 100,000 people, whereas in the rest of the country it was around 21 homicides per 100,000 people.

Figure 1.
Trends in homicide rates along the Mexico-US border

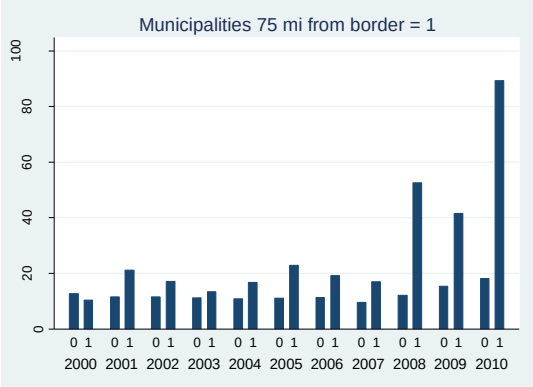
Panel A.



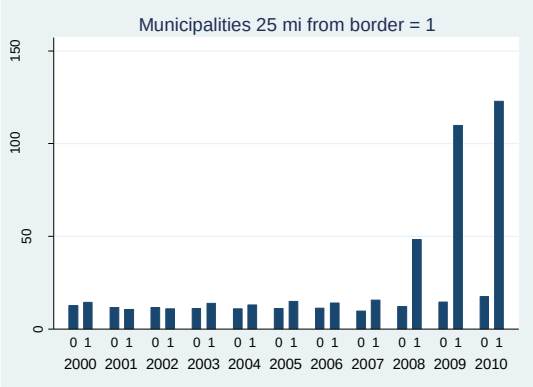
Panel B.



Panel C.



Panel D.



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 percent of Mexicans migrating within the country came from border states: Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas. By 2010, almost 24 percent 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. 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.

A recurring argument in the media is not only than wealthy families are migrating, but that they are establishing businesses or otherwise investing in the United States. In this respect, we found that the proportion of self-employed immigrants 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 no 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 by schooling level, where college denotes those who 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.

When we take a closer look to the border,[4] 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 percent in 2010, whereas it is only around 40 percent 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.
We also estimated the growth rates of businesses in border and non-border states.[5] Contrary to our previous findings on

[4] Table not shown.
[5] Table not shown.

self-employment, 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.

In order to strengthen these findings, we estimated the following regression:

$$Y_{jt} = \alpha + \beta Homicide_{jt} + \theta Homicide_{jt} \times Border_j + \gamma Urate_{jt} + \delta_j + \mu_t + \varepsilon_{jt}, \quad (1)$$

where Y_{jt} is the logarithm of the outcome of interest in county j and year t; $Homicide$ is the logarithm of homicide rate weighted by distance to Mexican municipalities within 150 miles from the border; $Border$ is an indicator variable of counties in border states; $Urate$ is the logarithm of the unemployment rate; δ_j are county fixed effects which control for county characteristics are time-invariant; and μ_t are year fixed effects which control for the overall health of the U.S. economy. 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.

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. So we would expect the parameter θ to the positive. Table 2 presents the results of the estimation on the number of Mexicans who migrated in the year prior to the survey. The parameter on the interaction term is always positive when it is statistically significant. In column one for instance, we find that a 1 percent increase in the homicide rate leads to around a 0.14 percent decrease in migration, but to a 0.68 percent increase of Mexican immigrants to the border. Analogously, we find that a 1 percent increase in homicide rates in Mexico leads to a 2 percent increase of college-educated Mexican immigrants, and a 0.51 percent increase of secondary-educated Mexican immigrants to the border. As expected, the unemployment rate has a negative effect on migration.

Table 2. 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	-1.0227	-1.8887	-0.1099	-0.4769**
	[0.2062]	[1.2021]	[1.1921]	[1.6735]	[0.1997]
Border dummy * Homicide rate	0.7249***	0.6395	2.0315*	-0.0312	0.5162*
	[0.2548]	[1.2138]	[1.2072]	[1.6826]	[0.2859]
Unemployment rate	-0.7894***	0.0104	-0.2154	-0.1622	-0.4391**
	[0.2516]	[0.1149]	[0.1362]	[0.1293]	[0.1969]
Constant	1.0448	0.5999*	0.0519	0.2906	0.5609
	[0.6983]	[0.3255]	[0.3962]	[0.3738]	[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

The effect found in the previous table could be the result of spurious correlation between homicide rates and migration inflows into the United States. In order to test for that, we estimated equation (1) using the death rate from internal causes instead of homicide rates (homicide is an external cause of death) as a "fake experiment".[6] We find that the effect disappears when we used this other explanatory variable. We also estimated equation (1) using inflows of Americans and non-Mexicans. As expected, we found that homicide rates in Mexico do not have any effect on geographic mobility of those two groups. We think these findings provide evidence that the results presented in Table 2 are not a consequence of spurious correlation.

Table 3 tests whether there is an effect of homicides in Mexico on the number of business establishments in the United States. Surprisingly and contrary to our findings in the descriptive section, we find that violence did not spur a boom of business openings in the border states, but all over the United States. In any case, the interaction term is negative which means that the average effect of homicides on

[6] The results of these robustness checks are not shown.

business openings in border states is lower than the average effect on the United States as a whole.

Table 3. Effect of Mexican violence on the number of business establishments in southern 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	0.0080	0.0545***	0.0513***	0.0296*
	[0.0143]	[0.0122]	[0.0187]	[0.0148]	[0.0165]
Border dummy * Homicide rate	-0.0117	0.0011	-0.0416**	-0.0386**	-0.0212
	[0.0145]	[0.0124]	[0.0191]	[0.0151]	[0.0178]
Unemployment rate	-0.0125***	-0.0033	-0.0091*	-0.0237***	-0.0347***
	[0.0033]	[0.0036]	[0.0047]	[0.0052]	[0.0059]
Constant	10.6428***	10.0343***	9.0082***	8.5694***	8.1491***
	[0.0090]	[0.0101]	[0.0128]	[0.0145]	[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

Discussion and Concluding Remarks

The regression results confirmed some of our findings on the descriptive analysis: the upsurge in violence in Mexico did produce a spur of immigration to the states in the southern U.S. border. However it also conduced to more business openings in the United States with no greater effect in the southern border states as suggested in both the media and the descriptive analysis.

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 have spurred a boom of businesses along the border, 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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