UNAUTHORIZED IMMIGRATION AND CRIME ALONG THE U.S. – MEXICO BORDER

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Introduction

The perception that immigrants are directly linked to crime in the United States has increased in recent years. The argument is that immigrants are crime committers, especially those without the proper permission to reside within the United States. The recent turmoil related to drug trafficking taking place in Mexico has brought the attention to the United States (U.S.) border area. According to news reported by CBS in July 2010, illegal immigrants are seven percent of Arizona's population, but make up nearly 15 percent of the state's prison population. They represent 14 percent of all inmates jailed for manslaughter and murder, and 24 percent of inmates on drug charges, even if the overall crime rate is down. On the other hand, the Federal Bureau of Investigations (FBI) reports that for this decade, violence in the cities across the southern border is down. In San Diego, California violent crime is down 17 percent; El Paso, Texas, while sitting across Ciudad Juarez, Mexico, one of the most dangerous cities in the world, violent crime is down 36 percent; in Phoenix, Arizona crime rate has dropped 10 percent from 2000 to 2009 (CBS News, 2010).

Although, there is considerable support for the notion that crime is highly correlated with the unauthorized Hispanic immigrant population along the border, there is little research linking the two. To obtain a better understanding of how the unauthorized Hispanic immigrant population living in the United States impacts crime, we examine a panel database covering the 24 U.S. border counties, and 24 U.S border-adjacent counties along the U.S. – Mexico, for the years 2000 to 2008. As the main variables, this panel contains annual crime data and the number of unauthorized immigrants apprehended by the U.S. Customs and Border Patrol (CBP) along the nine southbound border sectors. Controlling for economic and socio-demographic

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characteristics, we estimate the impact that unauthorized immigrant population has on crime in the 48 counties of interest. The hypothesis that unauthorized immigrants have an impact in increasing of crime rates is rejected at the 5 percent level of significance, under strict statistical standards; however, some degree of relationship is suspected for property crime rate at the ten percent level for the border counties.

Historical Background of Migration between Mexico and the United States

The United States and Mexico share one of the largest border areas in the world. Almost 2000 miles long, the border both divides and brings these two countries together. The border region as currently delineated was created in 1848 after the end of the Mexican-American War under the Treaty of Guadalupe-Hidalgo. From Tijuana to Matamoros, and from San Diego to Brownsville, the border region has peculiar conditions seldom seen in any other place in the world. Social, economic, cultural, and geographic factors between the two nations blend together, creating a territory with characteristics considerably different from the general characteristics of the countries themselves (Anderson, 2003).

The economic differences between Mexico and the United States intensified during the first half of the 19th century (Franko, 1999). The labor market in the United States became a great opportunity for progress for Mexican workers given the conditions in Mexico. In search of better living standards, a migration of Mexican workers to the United States started to develop. The shortage of labor in the United States during World War I and World War II generated a demand for Mexican workers, especially in the agricultural and industrial sectors (Massey, Durand, & Malone, 2002; Reimers, 1998). Agreements to supply the United States with Mexican labor were implemented. Between 1942 and 1964, the Mexican Farm Labor Program

Agreement, better known as the *Bracero*[1] Program, was implemented as a guest-worker program between Mexico and the United States. This program allowed for the temporary employment of Mexican workers in the United States in the agricultural field. Eventually, working in the United States became a relatively common practice, especially for the Mexican workers along the border states.

Toward the end of the *Bracero* Program, the flow of Mexican labor to the United States became a challenge to both countries (Fullerton & Barraza-De Anda, 2009). In order to manage this flow, U.S. federal representatives and Mexican officials agreed on improving border controls. The U.S. committed to strengthening borders and returning unauthorized workers, mainly Mexicans, to their native countries. A rigorous, aggressive, and innovative campaign against unauthorized border crossings was developed during a decade, until it was officially announced in May 1954 as Operation Wetback (Hernández, 2006). Since the beginning of Operation Wetback, the number of Border Patrol officers was increased and spread along the southwestern region of the United States. The collaborative effort between U.S. and Mexican officials resulted in more than one million persons apprehended and deported within one year of activities (Hernández, 2006).

Upon termination of the *Bracero* Program, the Mexican government implemented alternative programs to provide employment to the former *Braceros;* however, such programs were concentrated on industrial and manufacturing activities. Workers with agricultural skills, who previously worked in the United States, maintained this pattern rather than adapting to the newly available jobs in the industrial sector (Reimers, 1998). Regardless of the efforts to prevent unauthorized border crossings, immigrants continued to evade legal ports of entry. Border-

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[1] Bracero, derived from the Spanish word *brazo,* or "arm", the word can be translated loosely as "farmhand" (Massey, Durand, & Malone, 2002).

crossings became more restrictive for foreigners from several countries. This included Mexican workers whom the U.S. government had previously permitted to temporarily stay in the United States.

In 1986, during Ronald Reagan's administration, the Immigration Reform and Control Act[2] (IRCA) was passed in an effort to decrease the number of unauthorized immigrants flowing into the United States. IRCA was designed to decrease the number of unauthorized immigrants in four different ways. First, it imposed sanctions on U.S. employers hiring undocumented workers. Second, it increased resources for the U.S. Border Patrol. Third, it granted permanent citizenship to undocumented workers who resided in the United States prior to 1982. Lastly, IRCA implemented a legalization program for undocumented farm workers (USCIS, 2010). The Reagan administration undertook the latter in order to decrease political pressure from agricultural growers. Under IRCA, for the first time in U.S. immigration history, sanctions were imposed on U.S. employers hiring undocumented workers. (USCIS, 2010)

In the 1990s, additional measures were taken to improve immigration controls. Chain-link fences on the border were replaced with 10-foot high steel double fences in heavily crossed border areas (Anderson, 2003). In 1996, the Illegal Immigration Reform and Immigrant Responsibility Act[3] (IIRIRA) was passed, which was designed to increase penalties for those smuggling people, undocumented migrants, and those who over-stayed their visas. There was also an increase in the number of border patrol agents and budget allocation to continue with these efforts (Massey, Durand, & Malone, 2002). The goal of programs like "Operation Hold the Line" or "Operation Gatekeeper" was to deter the entry of undocumented immigrants rather than

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[2] Amendment to the initial Immigration National Act (INA) created in 1952. The INA brought together a variety of statutes that governed immigration into one Act (U.S. Citizenship and Immigration Services, USCIS, 2010).
[3] Additional amendment to the INA.

to apprehend them once in the United States.[4] This type of operation, enacted at the busiest ports of entry, pushed the inflow of undocumented immigrants into more difficult terrain, such as the Arizona-Sonora dessert.

As stated by (Fullerton & Barraza-De Anda, 2009), the general concern on the part of the United States over undocumented border crossings has changed overtime. At one point, the concern was related to undocumented immigrants taking native North Americans' jobs. Later on, the concern shifted to the additional burden on public services generated from this segment of immigrants. After the terrorist attacks of September 11, 2001, the debate has broadened to include national security concerns (Fullerton & Barraza-De Anda, 2009). At various points in time, and even more so recently, drug trafficking has also been a major concern. Attempts to prevent the entrance of undocumented immigrants, especially along the border with Mexico have continued to take place. Such is the case with the "wall" built along the U.S. - Mexico border to deter undocumented crossing along typical high-border crossing areas and those with geographic constraints for manpower surveillance capabilities (Fullerton & Barraza-De Anda, 2009).

Immigration: An International Phenomenon

The permanent relocation of an individual in an effort to improve his or her current living conditions is a common phenomenon. The occurrence of such movement, from a political or administrative area to another, is called migration. When migration is between countries, this is called international migration (DHS, 2010). The determinants for migration have been widely studied. Standard economic theory states that migration is an income maximization decision.

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[4] Hold-the-line in El Paso, Texas enacted in September 1983 and Operation Gatekeeper in San Diego, California, enacted in October 1993 were part of the initial phase of the National Strategic Plan (NSP). These operations included an increased number of personnel, equipment, technology, and tactical infrastructures This strategy was known as "Prevention Through Deterrence" (Haddal 2010, p. 4-5).

Push factors, such as higher wages and improved employment conditions between two countries counteract the costs associated with the movement (Massey, Arango, Hugo, Kouaouci, Pellegrino, & Taylor, 1993; Massey, Durand, & Malone, 2002). Sjaastad (1962) stated that migration is an investment decision in which an individual chooses to migrate if expected wages exceed wages at the location of origin in addition to the associated moving costs. Thus, economic gains are the only incentives for migration. The Harris-Todaro model states that internal and international migration is a response to differences between rural and urban income expectations. The higher income expectations generated by a larger number of opportunities in alternative labor markets, and a positive difference between returns and costs of movement induce individuals to migrate (Todaro & Smith, 2003).

The "new economics of migration" asserts that migration decisions are interdependent family-based rather than individual-based decisions. Income transfers from migrants to their home countries are the result of those family-based decisions, reducing uncertainty and income instability for both the individual, and the family members (Chen, Chiang, & Leung, 2003). Opposed to what other theories state, wage differentials are not the key moving factors for labor migration (Stark, 1991).

Estimates by the United Nations on international migration show an increase in the migrating population from 82 million in 1970 to about 175 million in 2000, an increase by a factor of 2.1. Increased economic differences between developing and developed countries after 1970, resulting in economic incentives, translated into a dominant trend of international immigration from developing to developed countries (United Nations, 2004). By 1980, countries that historically had been considered as net exporters of workers, such as Italy, Spain, and Portugal, became immigrant receivers from Africa, Asia, and the Middle East (Massey, Arango,

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Hugo, Kouaouci, Pellegrino, & Taylor, 1993; Massey, Durand, & Malone, 2002). From the individual perspective, the investment decision of migrating internationally has additional costs if it takes place as an undocumented individual. An individual who illegally crosses a border incurs physical risks and monetary charges beyond the temporal, monetary and psychological costs traditionally associated with any type of relocation (Hanson, 2006).

Given that undocumented migration is not reflected in official statistics, different types of organizations have made an effort to estimate this number. The United Nations estimated that by the late 1990s, there were approximately 3 million undocumented immigrants in Europe. For the United States it was estimated that by 2000, 31 million persons were foreign-born, at least 7 million of these were undocumented immigrants, 4.8 million of which were of Mexican origin (United Nations, 2004). The Pew Hispanic Center (PHC) estimated 11.9 million unauthorized immigrants living in the United States in 2008 (PHC, 2009).

Immigrants in the U.S. are not a monolithic segment of society, and their impact on various systems is best approached by describing the effects of particular groups on particular systems (Rothman & Espenshade, 1992). The literature has considered the effects of skilled versus unskilled immigrants, temporary versus permanent immigrants (Borjas, 1995; Council of Economic Advisors, 2007; Peri, 2010;). The economic literature on immigration to the United States has focused on the impact of migrants on wages (Nadadur, 2009) and the fiscal impact they may have (Blau, 1984; Council of Economic Advisors, 2007; Muller & Espenshade, 1985, 1985; Siskin, 2005).

Crime and Immigration

Crime is a complex issue that requires an extensive analysis by different field scientists, such as economists, sociologists, psychologists, etc. In order to guide adequate policy making

aimed at achieving higher levels of well-being in a society and avoiding harm to the members of a society, it is of crucial relevance to understand the possible causes of crime. Becker (1968) hypothesizes that an individual's rationally expected utility of committing an offense is calculated by weighing the probability of getting caught and the cost of punishment versus the probability of not getting caught and the subsequent benefit. If the cost outweighs the benefit, then the individual will opt not to commit the crime (Becker, 1968).

Brown and Reynolds (1973) modify this theory by taking into consideration that the wealth and/or income of an individual have an impact on the attitude of the individual toward risk; however, the direction of this relationship has not been clearly demonstrated. The economic theory of crime can be seen as a special case of rational choice theory. Under the rationality assumption it is postulated that an individual seeking to maximize utility or personal benefit, will weigh the costs against the benefits of each available option (Ehrlich, 1973). Thus, the individual would decide between legitimate versus illegitimate activity, and then choose the action that yields the highest utility (Ehrlich, 1973).

Ehrlich uses Becker's model to conduct an extension using time allocation considerations. Time allocation models of crime assume that an individual must allocate his/her time between legitimate and illegitimate activities (Ehrlich, 1973). If legal opportunities are scarce, then under the fixed time allocation assumption, crime becomes the more appealing option (Ehrlich, 1973). Also, when estimating the supply of crime, it has proven useful to examine substitution and spillover effects. Substitution occurs when the occurrence of one type of crime increases as the cost of another type of crime decreases. Spillover effects occur when cost differentials between neighboring districts cause crime to be higher in the less costly district (Eide, Aasness, & Skjerpen, 1994). Conversely, Shaw, Clifford, and McKay (1942) support the

social-disorganization theory, where crime is a consequence of communities' disabilities to align common values to solve common problems (Shaw & McKay, 1942). Merton argues that deviant behavior is a sign of discontinuity between culture and structure within a society (Merton, 1938).

The link between crime and immigration has been studied in different countries for decades. The impact that immigrants may have on crime is often of interest to the receiving country. For instance, in Italy during the 1990s, political and social debate emerged based on a major influx of immigrants from neighboring countries. Several Italian provinces were studied to consider the relationship between crime and immigration. It was concluded that immigrants did not have a significant effect on overall crime rates in Italy given that it was found to only have a small effect on property crimes (Bianchi, Buonanno, & Pinotti, 2008).

Given that the United States has historically been a country with a large number of immigrants, the impact of crime in the nation linked to immigrants has risen as a topic of study. Aspects considered are the likelihood of immigrants to commit crime versus their native counterparts and how cultural, structural, and/or individual differences may impact the delinquent behavior (Hagan, Levi, & Dinovitzer, 2008). During the 1920s, it was public perception that foreigners residing in the United States, especially Southern and Eastern Europeans, through their use of alcohol and drugs were more prone to committing crimes (Hagan & Palloni, 1998). Congressional acts in 1921 and 1924 reduced the number of foreigners admitted into the country (Hagan, Levi, & Dinovitzer, 2008). Later, Joseph Gusfield, in his "symbolic crusade," promoted the idea that drug-addicted, drunken, criminal immigrants represented a threat to U.S. social order (Gusfield, 1986). The connection between immigration and crime was established as a societal element and was embedded in the political setting.

During the 1990s, U.S. political leaders frequently linked immigration directly to crime, translating it into legislative proposals. Political figures such as Senator Alan Simpson and former presidential nominee Patrick Buchanan explicitly stated that high crime rates were being experienced as a result of large numbers of authorized or unauthorized immigrants entering the country (Butcher & Piehl, 1998). Efforts for the reduction of crime were undertaken through immigrant control policy making. Public fears against immigrants and particularly, unauthorized-immigrants, were intensified through non-citizen expelling policies, making the link between the immigrant population and criminal activities stronger (Butcher & Piehl, 1998).

The impression that there is a direct relationship between immigration and crime is not supported by empirical research (Reid, Weiss, Adelman, & Jaret, 2005). In absolute terms, immigration increases crime because the net population in the country increases if no emigration counterbalances net population. Given that the characteristics of the majority of immigrants in the United States are primarily young and male, age and gender are necessary aspects to be considered when attempting to determine if immigrants contribute to crime beyond their native counterparts (Hagan & Palloni, 1998).

Butcher and Piehl (1998) and Reid, Weiss, Adelman, and Jaret (2005) examine the overall impact of immigration on criminal activity throughout various U.S. metropolitan statistical areas (MSAs). Butcher and Piehl (1998) evaluate the mean of 43 MSAs in a time series analysis from 1980 to 1990, while Reid, Weiss, Adelman, and Jaret (2005) conduct a cross section study using a stratified sample of 150 MSAs for the year 2000. Both studies use a fraction of immigrants living in U.S. as the primary explanatory variable and crime rates as the dependent variable. However, Reid, Weiss, Adelman, and Jaret (2005), examined violent and property crime rates separately. Their study analyzed immigration using the size of the recent

foreign born total population divided into three specific groups: Asians, Latin Americans, and English speakers. After controlling for some social, economic, and demographic characteristics, it was concluded that the variables used for immigration have no significant effect on violent or property crime rates. On the other hand, it was concluded that economic and demographic variables, such as economic deprivation and divorce rates, favored crime (Reid, Weiss, Adelman, & Jaret, 2005). Butcher and Piehl (1998) found no effect on crime caused by immigration; however, relatively younger and less educated males, immigrants, and natives were show to have a high impact on crime. Reid, Weiss, Adelman, and Jaret (2005) found that rather than immigration causing an increase in crime, a relatively large share of foreign born individuals in the population in metropolitan areas reduces some crime rates, such as homicide and larceny. Similarly, based on the analysis of ethnic origin and generational status, Hagan, Levi, and Dinovitzer (2008) conclude that states with high rates of immigration are more likely to experience crime reduction rather than crime growth.

The U.S. Commission on Immigration Reform (CIR) assessed the potential impact of Hispanic immigration on crime for 244 MSAs in 1994 (U.S. CIR, 1994). In addition to demographic and economic control variables, the CIR took into account the geographical proximity of the U.S.-Mexican border to examine the effects on violent and property crimes. The conclusion of the study asserts that when demographic characteristics are held constant, crime in border areas is, on average, lower than in other U.S. cities. Hagan and Palloni (1998) also consider the geographical proximity to the U.S.-Mexican border when examining 34 MSAs located in California, Arizona, Colorado, New Mexico, and Texas. An estimation of the unauthorized immigration was regressed on arrest rates to proxy violent, property, and total

crime rates. No consistent evidence was found to suggest that immigrants are more likely to get involved in criminal activities than native individuals similar in age and gender.

Martinez, Stowell, and Lee (2010) conducted a panel study using the three most recent decennial census years, examining the immigration-crime relationship at a neighborhood level for San Diego, California. Homicide rates are the proxy for crime, and the data was regressed on the percentage of foreign born individuals for 297 communities in the San Diego vicinity. Social and economic structural indicators were used as control variables. It was found that, "over time, more immigration results in fewer overall homicides supporting the immigration revitalization perspective" (Martinez, Stowell, & Lee, 2010, p. 821).

Several studies have examined the impact of immigration on crime in the United States; a limited number have focused on the impact of unauthorized immigration in particular. Hanson (2006) utilizes an alternative measure to estimate the number of authorized immigrants. He employs the residual foreign-born population method, estimating the difference between the number of foreign born individuals and the number of past legal immigrant flows. Espenshade (1995) explores undocumented crossings and their relationship with the number of apprehensions made by the U.S. Border Patrol. He finds that although the number of apprehensions is considerably lower than the actual number of unauthorized immigrants, there is a strong correlation between the two. Approximately 79 percent of the variability in the unauthorized migration flow may be explained with the number of U.S. Border Patrol apprehensions (Espenshade, 1995). Based on Espenshade's findings, Coronado and Orrenius (2005) use the number of apprehensions as a proxy for unauthorized immigrants. They explore the relationship between undocumented immigration and crime along the border area between Mexico and the United States. The findings are that though trends show crime rates declining in

the country from 1990 to 2000, undocumented immigration is related to higher violent crimes along the border region.

The empirical analysis we present measures the relationship between crime and undocumented immigration in the border region between Mexico and the United States, taking into account typically used crime determinants.

Data

The Federal Bureau of Investigation (FBI) compiles and reports crime figures as part of the Uniform Crime Report (UCR). The crime data collected includes annual figures for years 2000 to 2008 for 24 counties bordering Mexico (hereafter known as *primary counties*)[5], and 24 adjacent counties (hereafter known as *secondary counties*)[6]. Data on crime consist of violent crime, property crime and total crime. "Violent crime consists of murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault. Property crime includes offenses of burglary, larceny-theft and motor vehicle theft" (FBI, 2010) [7]. The number of apprehensions of unauthorized immigrants[8] is collected by sector from the U.S. Customs Border Patrol (CBP). The United States is divided into 21 border patrol sectors, of which nine are adjacent to Mexico. Given that apprehensions are reported by sectors, data for each sector is disaggregated by county. For the purposes of our study, the allocation of apprehensions will pertain only to the primary and secondary counties.

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[5]Primary counties are San Diego and Imperial counties in California; Yuma, Pima, Cochise and Santa Cruz counties in Arizona; Luna, Hidalgo and Dona Ana counties in New Mexico; and Brewster, Culberson, Cameron, El Paso, Hudspeth, Hidalgo, Jeff Davis, Kinney, Maverick, Presidio, Starr, Terrell, Val Verde, Webb and Zapata counties in Texas.

[6] Secondary counties are Riverside in California; La Paz, Graham, Greelee, Maricopa, and Pinal in Arizona; Grant, Otero, Sierra in New Mexico; Pecos, Reeves, Crockett, Edwards, Dimmit, Sutton, Zavala, Uvalde, La Salle, Duval, Jim Hogg, McMullen, Brooks, Kenedy, Willacy in Texas.

[7] For further detail for the definitions of each type of crime, refer to appendix 2.

[8] CBP defines an unauthorized immigrant either as an individual who has entered the United States without proper documentation or permission, or as an individual who has entered legally, but who violates his or her immigration status (U.S. DHS, 2010).

Data is presented in annual figures for the years 2000 to 2008. The number of police officers was compiled from the UCR, reported by the different local law enforcement agencies within counties. Per capita income, consumer price index, and population figures were obtained from the Bureau of Economic Analysis (BEA). Median age at the county level was retrieved from the U.S. Census Bureau. For those counties with population less than 65,000 inhabitants, median age data were extrapolated (see appendix 1 for details). Figures for total diploma recipients and employment were obtained from the Bureau of Labor Statistics (BLS) and the Institute of Education Sciences (IES), respectively.[9] Given that the percentage change year-to-year for the majority of the counties is relatively small, figures for 2007 were used in place for those missing data on diploma recipients for years 2008. Based on the U.S. Census definition, counties with metropolitan statistical areas (MSAs) classified as urban areas (U.S. Census Bureau, 2010).

Model

The literature reveals varied results on the relationship between crime and immigrants in general. We built a panel data model to measure the relationship between crime and unauthorized immigration for the counties along the border between Mexico and the United States. Two set of regressions were developed utilizing the number of U.S. CBP apprehensions as a proxy for unauthorized immigrants for the years 2000-2008. The first set compiles the 24 primary counties, while the second set corresponds to the 24 secondary counties.

Crime rates were used as dependant variables in the regression. Three different specifications for crime rates; total (CRIT), violent (CRIV), and property crime (CRIP) rates were regressed on the number of apprehensions. U.S. CBP apprehension figures are

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[9] The number of high school diploma recipients per year was reported by academic year and matched to natural years (i.e. high school diploma recipients reported for year 2005 were enrolled in academic year 2005-2006).

disaggregated using an exponential function considering the distance of each county from the borderline. "Prevention through Deterrence," as part of the U.S. CBP chief operation strategy (Haddal, 2010), has resulted in a larger number of apprehensions closer to the borderline. Not all apprehensions are executed along the border; however, the number will decline as the distance to the border increases. In order to control for population differences among counties, absolute figures on crime and apprehensions are divided by thousand populations to produce a rate for both of these variables.

Economic and socio-demographic variables are typically used as control variables when studying crime (Howsen & Jarrel, 1987; Kameel-Meera & Jayakumar, 1995). For our study, we include economic and socio-demographic variables at the county level. High school diploma recipients are used as a proxy for education (EDU). The number of high school graduates was converted into a rate by thousand of population for each county. Median age is used to capture the impact of age on crime. As age is typically a nonlinear function, we include median age (MAGE) and median age square (MAGESQ). A dummy variable for urban areas (METRO) is constructed for the counties, where 1 (one) is an urban area, 0 (zero) otherwise. Counties classified as metropolitan counties[10] are assigned a 1. Non-metropolitan counties are assigned a 0. Absolute figures on employment were divided by thousand populations to produce an employment rate (EMP), controlling for population differences between counties. Per capita personal income is deflated using the consumer price index, with 2005 as price-year basis (PCPI). To account for law enforcement at the county level, the total number police officers (ENF) is included. This number is also accounted for population differences and presented as enforcement rate per thousand people. To account for spillover effects, we examined separate

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[10] Urban areas include San Diego, Imperial, Riverside, Yuma, Pima, Maricopa, Pinal, Dona Ana, El Paso, Webb, Hidalgo (TX), and Cameron counties.

models for each level of proximity, distinguished for border counties as primary counties, and adjacent-border counties as secondary counties. Model specification used for primary and secondary counties are presented below.

$CRIT_{ij} = \beta_0 + \beta_1 APH_{ij} + \beta_2 PCPI_i + \beta_3 EMPij + \beta_4 EDU_{ij} + \beta_5 MAGE_{ij} + \beta_6 MAGESQ_{ij} + \beta_4 ENF_{ij} + \beta_4 METRO_{ij} + \varepsilon_{ij}$ (1.a)

$CRIV_{ij} = \beta_0 + \beta_1 APH_{ij} + \beta_2 PCPI_i + \beta_3 EMPij + \beta_4 EDU_{ij} + \beta_5 MAGE_{ij} + \beta_6 MAGESQ_{ij} + \beta_4 ENF_{ij} + \beta_4 METRO_{ij} + \varepsilon_{ij}$ (1.b)

$CRIP_{ij} = \beta_0 + \beta_1 APH_{ij} + \beta_2 PCPI_i + \beta_3 EMPij + \beta_4 EDU_{ij} + \beta_5 MAGE_{ij} + \beta_6 MAGESQ_{ij} + \beta_4 ENF_{ij} + \beta_4 METRO_{ij} + \varepsilon_{ij}$ (1.c)

Where β_0 is the intercept of the equation and the error, ε_{ij}, is independently and identically distributed (i.i.d.) with zero mean. The subscript i represents the ith observation of the annual series from 2000 to 2008; the subscript j represents j^{th} county among the 48 border counties.

Empirical Results

Tables 1a and 1b show the sample means and standard deviations for the 432 observations for years 2000 to 2008; 216 observations corresponding to the 24 primary counties and 216 observations corresponding to the 24 secondary counties. Ordinary Least Squares (OLS) are used for the regression analysis. At the possibility to explaining increases in crime as a result of more police officers, endogeneity between the two variables is considered (Wooldridge, 2009). To avoid the likelihood of endogeneity between the three types of crime (CRIT, CRIV, and CRIP) and the number of police officers, ENF was lagged. To capture the effect in time of some of the control variables, EDU, PCPI, and EMP were lagged. After several iterations, the optimal lagged structure was developed; the variables were examined for multicollinearity using the correlation matrix (see appendix 3 for details). For secondary counties, a high correlation between APH and ENF was found; the difference in the number of police officers (ENF) between years was utilized to minimize for it. In order to correct for potential heteroskedasticity

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and serial correlation, General Least Squares (GLS) specification was estimated using period SUR covariance structure. Table 2 summarizes estimation results with parameter coefficients, standard errors, r-squares, and Durbin-Watson statistics.

The coefficient of our variable of study, apprehensions, is found not to be statistically significant at the 5 percent level for both, primary and secondary counties. However, property and total crime show statistical significance at the 10 percent level for primary counties. The education coefficient is negative and significant at the 5 percent level for all types of crimes in the primary counties, as well as for property and total crimes in secondary counties. The estimated coefficient for education for the primary counties suggests that for approximately ten additional high school graduates per thousand people, violent crimes would go down by one crime per thousand people. For every additional high school graduate per thousand people, it would result in a decrease approximately one crime per thousand people for total and property crimes at the primary border counties. For the secondary counties, the impact of education on property and total crimes show a similar trend as in for primary counties, but with diluted effects.

With the exception of violent crimes in the primary counties, the coefficients for median age appear to be statistically significant at the 5 percent level for both, primary and secondary counties. The F-test for median age and median age squared show that the estimated coefficients have a combined statistical significance. After examination of the data, it is observed that median age is a quadratic function of age. As age increases, crime increases in a non-linear fashion. The coefficient of the urbanization variable is positive and significant at the 5 percent level only for violent crimes in the primary counties. For secondary counties, results suggest that urbanized areas are more prone to experience violent crimes. For employment, the coefficients were not statistically significant for either one of the crimes examined, in both primary or secondary

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counties. The coefficient for per capita income shows no statistical significance for secondary counties, or violent crimes in primary counties. Although positive and significant, property crime impact on primary counties is very small to make strong assertions.

For the primary counties, the coefficient for law enforcement officers is not statistically significant. However, in the secondary counties, law enforcement was statistically significant for all three crime rates. Results suggest that for every additional law enforcement officer per thousand people, property and total crimes would decrease by one crime per thousand people. Violent crime would be reduced by one crime per thousand people for every 10 additional law enforcement officers.

Discussion

This analysis examines the relationship between unauthorized immigration in the United States and its impact on total crime, violent crime, and property crime rates in 24 border counties and 24 border-adjacent counties for the years 2000 to 2008. Our topic of study has not been extensively researched. However, findings from Coronado and Orrenius state that "unauthorized immigrants are positively correlated with violent crime rates," but "appear unrelated to the property crime rate" (Coronado & Orrenius, 2005; p. 14 and 19). The research hypothesis in our study is that the number of unauthorized immigrants is positively related to crime rates in the border region. Our statistical analysis, with a 5 percent level of significance, allows us to state that unauthorized immigration does not impact crime in the border region. However, the significance level may still have useful information to convey.

Although the hypothesis is rejected at strict statistical standards, a relatively low p-value (.072) in property crime for border counties suggests some degree of relationship between unauthorized immigrants and property crime. Under this consideration, four factors may be used

to explain the relationship between unauthorized immigration and property crime rates. First of all, an increase in population overall may lead to an increase in crime rates; therefore, the specific increase in the number of unauthorized immigrants may have this effect due to a net increase in population. Secondly, the unauthorized immigrant population may more readily commit property crime; however, there is little empirical evidence for this conclusion. Conversely, due to the vulnerability of the unauthorized immigrant population, they may be more likely to be victimized by crime and less likely to report it (Coronado and Orrenius 2005, p. 4) Finally, the possible displacement of native workers in the job market may result in the reduction of job opportunities (Borjas, 1995), which may translate into an increase in crime committed by the native population.

It is expected that the more education an individual has, the less likely that individual will be to engaged in criminal activities. Our variable used to measure education shows to have a two-year delayed effect on crime. However, the results for our variable violent crimes for the secondary counties were not statistically significant. This leads us to suggest that a difference between the two groups of counties is present. It is observed that most of the secondary counties lack of the existence of higher education institutions. The lack of this type of institutions may result in a population with limited educational opportunities, which would ultimately lead to violent crimes.

For our study, urbanization was not statistically significant for the secondary counties. This may be given that out of the 24 counties, only three were considered as metropolitan areas (U.S. Census Bureau, 2010). For the primary counties, it is expected that urbanization will result in more crimes. The reluctance of people to help others, who they do not know, causes crime rates to increase (Howsen & Jarrel, 1987). Consequently, the more urbanized an area is, the

higher the crime rates. This is consistent with our results for the urbanized areas along the primary counties.

Age is an element often considered important in determining the likelihood of a person engaging in any criminal activity (Butcher & Piehl, 2008). The age at which crimes are committed is observed to have a nonlinear behavior. Engagement in criminal activities starts at early ages; the number of crimes committed grows disproportionally to the increments in age, up to a certain point (Butcher & Piehl, 2008).

Conclusions

While the analysis of immigration and crime in the United States has been extensively studied, empirical studies specifically examining the relationship between unauthorized immigration and crime are limited. The results presented provide empirical findings to this broadly discussed topic. As expected, results from this analysis suggest that education, age, number of police officers, and urbanization are determining factors for crime rates. The impact of these variables may differ according to the type of crime and the region-specific characteristics. While the level of law enforcement may have a positive impact in lowering crime rates for the adjacent-border counties, metropolitan statistical areas result in higher probabilities for violent crime. As for education, it is expected that communities with a larger number of high school graduates may be less prone for total and property crime to take place. Age also has an impact on the likelihood of occurrence of violent crimes at the border-adjacent counties. Even though the hypothesis of unauthorized immigrants having an impact in increases of crime rate is rejected at strict statistical standards, some degree of relationship is suspected for property crime rate and the border county level.

Further research would be necessary to compare the impact that unauthorized immigrants may have on crime versus their native counterparts, while controlling for other relevant variables. The possible implications for authorized and unauthorized immigrants, as well as for the native population, are to be considered separately. Additionally, as extreme observations or county-specific characteristics and, or policies at the county, state, or border patrol sector level may dilute overall effects, it may be of interest to consider different grouping of the counties along the border region. Studies considering metropolitan statistical areas with high concentrations of immigrants may be also enlightening.

Recommendations

The results of our study may have direct implications for decision makers on unauthorized immigration, law enforcement, education, income, and urbanization in the border region. Immigration to the United States has taken place throughout the years; immigration policies have evolved according to the needs based on the social, economic, and political conditions. The requirements for labor vary substantially upon the business economic cycle. Similarly, uneven economic growth may prevent the labor market from adjusting easily to these changes. During peak seasons, gaps in the labor market may attract foreign workers to satisfy the shortage in labor. Foreign workers, especially from Latin American countries, base their decisions to migrate to the United States on expectations for quality of life improvements. Regardless of the apparent need for foreign laborers, tight immigration regulations limit the free mobility of workers into the nation. As a result of the limited admission of legal workers, unauthorized inflow of foreign workers into the United States frequently occurs. Both, legal and unauthorized Hispanic immigrant populations are observable throughout the whole nation, particularly along the border states with Mexico. Border counties experience a peculiar situation

as immigrants establish or go through this region, such as racial and cultural mixes, unequal income and education levels, a high number of floating populations, and commercial activity caused by border shoppers, among others. As mentioned before, there may be increases in property crime related to increases in the number of unauthorized immigrants. Recommendations for crime deterrence are presented below.

Engagement in criminal activities is a decision based on the net gain from those activities. The perceived gains from criminal activity may change according to the social and legal environment (Howsen & Jarrel, 1987). The incentives of committing a crime dilute as the costs increase. The cost of crime may increase as the probabilities to getting caught rise. We recommend additional police presence in the communities by increasing patrolling time. Prioritizing out-in-the community police activities towards community order maintenance and law enforcement rather than office-related tasks may enhance crime deterrence. The increase in patrolling is a low-cost / high-return strategy. Additionally, the promotion of community groups is strongly recommended. For instance, neighborhood watcher and crime stopper programs collaborate directly with local law enforcement agencies as their eyes and ears. Building strong partnerships between local law enforcement agencies and the community would allow for the social environment to support efforts against criminal activity and as a prevention mechanism. Furthermore, increasing the number of safe community programs would allow for the collection and analysis of intelligence. This would enable law enforcement agencies to determine the areas requiring increased enforcement. Diffusion of policing results and achievements against criminal activity would also result in the prevention of crime. Public dissemination of information of the preventive measures as well as crime committers would discourage others from engaging in criminal activities.

Parallel solutions to current immigration strategies may be considered for the reduction of unauthorized immigration. The substitution of unauthorized immigrants by the admission of legal immigration would result in reaching a sustainable equilibrium between supply and demand of labor. In order to decrease the number of unauthorized immigrant population, a combination of strategies may be undertaken.

The admission of temporary legal immigration under a strict control, screening, and selection process would allow welcoming those immigrants that would be the most beneficial to the nation. A more advantageous situation would be accomplished through the implementation of an adjustable number of working visas and the use of temporary worker programs. Different labor market requirements would be covered through the admission of lawful temporary immigrants, including both, high and less-skilled workers. By enabling the number of temporary working visas to fluctuate according to the number of visas demanded, visa granting would help in protecting the national labor force during economic downturns.

Temporary worker programs would allow for the selection and screening of the newcomers. Developing eligibility criteria for program participation related to age, number of dependents allowed, background checks, level of skills specific to the jobs, and other characteristics may be imposed. The selection criteria would allow for a strict control and screening of those entering the country. For instance, detecting individuals with previous criminal activities and rejecting those individual from being admitted, would allow for the protection of the social order. Full understanding of the labor market needs is crucial for the creation of an appropriate temporary worker programs classification. By meeting the existent labor requirements through legal workers, the demand for an unauthorized labor force would decrease, ultimately reducing unauthorized border crossings.

The sponsorship for advanced-degree graduates to stay for longer periods would allow the nation to benefit from their human capital. If foreign students obtaining advanced degrees from universities in the United States are returning to their home countries, the benefits of their education would not directly impact the United States. Keeping the brightest minds regardless of their country of origin would preserve, and even enhance the current high level of scientific and technological innovation in the United States.

Enforcement of immigration laws, in combination with more options for lawful immigrants, would translate into higher risks for unauthorized immigrants, such as visa overstaying, working out-of-status, and unauthorized border crossings.

Additional policy considerations are related to education. Increasing the number of high school graduates, or equivalent, would be the first goal to achieve, followed by improvements in the quality of education, thereby increasing the level of the U.S. labor force skill composition, resulting in high returns in the near future. Higher quality of education from early childhood through 12-grade would result in a positive impact in the productivity levels (Council of Economic Advisors, 2007). At last, more on-the-job training and linking community colleges and universities to employers would allow for further skill building.

Lastly, in order for researchers to continue to examine the topic of unauthorized immigration and its impact to the nation, existing data should be made more readily available by the sponsoring agencies.

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Table 1.a **Sample Means (2000-2008)** for dependent variables, apprehensions, and control variables for border counties.

	Border Counties (Primary)								
Variable	2000	2001	2002	2003	2004	2005	2006	2007	2008
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Total Crime	29.3513	29.3547	28.9982	30.0591	30.7210	28.1022	27.1167	27.5088	26.2987
	(22.4763)	(22.0817)	(21.2703)	(22.5778)	(20.9699)	(19.0186)	(17.1323)	(17.1375)	(17.0289)
Property Crime	26.2798	26.2771	25.8016	26.8069	27.2952	24.9309	23.9782	24.4649	23.2096
	(20.7638)	(20.4153)	(19.6316)	(20.6989)	(19.3287)	(17.3920)	(15.7466)	(15.7623)	(15.8288)
Violent Crime	3.0714	3.0776	3.1966	3.2521	3.4258	3.1712	3.1385	3.0439	3.0891
	(1.9557)	(2.0926)	(2.0839)	(2.1698)	(2.2128)	(1.8884)	(1.7652)	(1.7110)	(1.5986)
Aprehensions	592.4151	445.5384	333.9296	292.1295	325.0737	347.1494	274.4639	188.0752	148.7491
	(540.7652)	(365.5838)	(245.0922)	(197.2078)	(204.4086)	(227.0675)	(154.1016)	(106.6315)	(103.5933)
Education(-2)	12.4292	12.1801	12.3517	12.0796	12.4096	12.9547	12.7859	12.6718	11.9784
	(2.6276)	(2.9031)	(2.2249)	(2.2965)	(2.5245)	(3.4152)	(2.4175)	(3.0333)	(3.2092)
Median Age	33.0000	33.0727	33.3812	33.5563	33.7898	33.9899	34.0500	34.2583	35.0500
	(4.8124)	(4.9238)	(4.9373)	(5.0415)	(5.1019)	(5.2204)	(5.2969)	(5.8168)	(5.8754)
Employment(-3)	428.5202	431.6164	432.6639	441.6817	440.0130	441.4494	450.8639	458.6999	466.0843
	(91.7424)	(95.3830)	(100.6409)	(113.7671)	(93.7609)	(90.7801)	(91.2738)	(97.8450)	(96.9920)
Percapita Income(-4)	12052.1181	13018.1475	13969.9880	14713.5001	16035.7059	17439.3282	18241.7122	19415.7247	20911.0253
	(3135.6545)	(3289.3857)	(3619.0508)	(3947.2003)	(4508.6624)	(4704.3883)	(4793.5927)	(4956.9308)	(5614.0277)
Enforcement(-2)	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
EnforcementDiff(-1)	0.0204	0.0868	-0.0629	0.0163	0.0658	0.2051	-0.1165	0.1109	-0.0156
	(0.1638)	(0.2895)	(0.3246)	(0.2291)	(0.1731)	(0.5475)	(0.3444)	(0.3323)	(0.2530)
Population	262990.21	266985.21	271178.63	275156.79	278694.71	282300.21	286094.04	290307.42	294961.17
	(592869.77)	(601931.17)	(609694.97)	(615784.40)	(618967.76)	(621768.77)	(624748.13)	(631621.35)	(641096.33)

Notes:

Standard Errors in parentheses.

Total Crime, Property Crime, Violent Crime, Aprehensions, Education, Employment, and Enforcement are given in thousand people.

Percapita Income is given in US dollars.

Table 1.b Sample Means (2000-2008) for dependent variables, apprehensions, and control variables for adjacent counties.

Variable	Adjacent Counties (Secondary)								
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
	Mean	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**
Total Crime	42.0085	43.2983	47.1569	45.2653	44.5430	43.1013	44.6158	44.7530	40.8828
	(93.5864)	(89.7231)	(95.8835)	(95.2450)	(93.4863)	(86.2184)	(90.1189)	(96.1776)	(75.2683)
Property Crime	37.3867	38.4753	41.7816	40.4303	39.4747	38.3040	39.1964	39.2054	35.2630
	(83.7013)	(80.4023)	(85.7724)	(85.4789)	(81.0962)	(77.5823)	(80.8770)	(86.8320)	(67.71557)
Violent Crime	4.6218	4.8230	5.3753	4.8351	5.0683	4.7973	5.4194	5.5476	5.6198
	(9.9784)	(9.4078)	(10.2928)	(9.8217)	(12.5030)	(8.7128)	(9.4055)	(9.5674)	(7.9913)
Aprehensions	1899.9818	1499.7388	1200.1575	1046.3866	1230.3474	1624.5816	1409.3547	973.1631	955.4209
	(5944.1685)	(4842.8760)	(3999.5235)	(3507.0170)	(4103.4942)	(5796.0837)	(5158.6436)	(3553.1633)	(3697.4028)
Education(-2)	12.6369	11.3989	12.2701	12.3330	12.2763	12.4341	11.8088	12.2165	11.4016
	(5.6306)	(5.5428)	(5.8189)	(5.5551)	(5.9230)	(5.2400)	(5.0223)	(5.8716)	(4.7597)
Median Age	35.2917	35.4146	35.6000	35.7646	35.9292	36.1146	36.2542	36.7625	36.8250
	(5.0161)	(5.0342)	(5.0345)	(5.0624)	(5.1074)	(5.1539)	(5.2430)	(5.5600)	(5.7845)
Employment(-3)	466.8190	462.8712	464.5371	462.3605	468.4530	471.0992	474.8186	483.3299	487.2300
	(170.5253)	(155.2623)	(160.5955)	(174.3874)	(186.4152)	(195.2279)	(197.5172)	(202.3943)	(196.0015)
Percapita Income(-4)	12381.1701	13155.6691	13940.2825	15031.1451	16531.1253	18340.5612	18785.5315	20548.8626	22179.4488
	(3206.2786)	(3048.9179)	(3341.6522)	(3910.4030)	(4222.5369)	(4876.1429)	(4730.1891)	(5170.1823)	(5513.1744)
Enforcement(-2)	2.8518	2.9182	2.8651	2.9919	3.0404	3.2118	3.1075	3.0979	3.2917
	(3.9506)	(4.5907)	(4.5336)	(4.5588)	(4.5190)	(4.5846)	(4.9500)	(4.3571)	(5.7470)
EnforcementDiff(-1)	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
Population	339831.08	364200.25	377708.58	400203.96	430530.25	477220.96	521114.38	558260.29	593569.83
	(919337.88)	(995216.94)	(1033824.71)	(1102884.07)	(1200695.49)	(1362901.57)	(1519573.57)	(1656086.86)	(1792128.04)

Notes:

Standard Errors in parentheses.

Total Crime, Property Crime, Violent Crime, Aprehensions, Education, Employment, and Enforcement are given in thousand people.

Percapita Income is given in US dollars.

Variable	Border (Primary)			Adjacent (Secondary)		
	Violent Crime	Property Crime	Total Crime	Violent Crime	Property Crime	Total Crime
	CRIV	CRIP	CRIT	CRIV	CRIP	CRIT
Constant	6.98552	225.7251	221.6298	71.76252	901.5797	970.2926
	(5.69781)	(38.33634)	(41.83061)	(23.5802)	(112.0378)	(133.9335)
APH	0.00032	0.00355	0.00414	0.00007	0.00021	0.00028
	(0.00030)	(0.00213)	(0.0023)	(0.0006)	(0.00027)	(0.00029)
EDU(-2)	-0.07909*	-0.60658*	-0.65478*	-0.01618	-0.28787*	-0.28238*
	(0.02861)	(0.17593)	(0.19037)	(0.034505)	(0.10618)	(0.12245)
MAGE	-0.15839	-9.95292*	-9.54205*	-3.93702*	-50.81298*	-54.19888*
	(0.32139)	(2.21244)	(2.41686)	(1.28733)	(6.12511)	(7.3384)
MAGESQ	0.00082	0.12005*	0.11233*	0.05793*	0.733668*	0.77639*
	(0.00456)	(0.03255)	(0.0356)	(0.01721)	(0.08308)	(0.09981)
METRO	1.26804*	6.00159	7.34714	0.76651	15.54963	15.26946
	(0.44884)	(3.96648)	(4.3963)	(2.20783)	(14.20686)	(16.41797)
EMP(3)	0.00024	-0.01262	-0.00805	-0.00352	-0.01104	-0.00784
	(0.002)	(0.01286)	(0.01462)	(0.00236)	(0.00733)	(0.00905)
PCPI(4)	0.00006	0.0004*	0.00043	0.0000001	-0.00018	-0.00001
	(0.00004)	(0.0002)	(0.00022)	(0.00005)	(0.00022))	(0.00024)
ENF(2)	-0.1258	-0.89231	-1.0567	---	---	---
	(0.14079)	(0.84914)	(0.9337)			
ENFD(1)	---	---	---	-0.1806*	-0.63961*	-0.71805*
				(-0.08712)	(0.26047)	(-0.28387)
Number of Observatio	216	216	216	216	216	216
R²	0.20429	0.3784	0.36188	0.13156	0.37578	0.30603
Adjusted R²	0.17354	0.35438	0.33722	0.09799	0.35166	0.27921
Durbin-Watson Statist	1.98442	1.8749	1.87618	1.96957	2.08357	2.12289

Table 2. Effect of apprehensions and control variables on violent, property and total crime rates for border and adjacent counties.

Notes:

Data of Coefficients; Standard Errors in parentheses.

Specific number of years lagged are noted in parentheses.

*p< .05

Appendix 1. Median age extrapolations (2000-2008).

	2000	2001	2002	2003	2004	2005	2006	2007	2008
San Diego, CA	33.20	33.10	33.70	34.40	34.50	34.40	34.00	34.20	34.20
Imperial, CA	31.00	*30.88*	*30.76*	*30.64*	*30.52*	30.40	30.50	30.40	29.70
Yuma, AZ	33.90	*33.98*	*34.06*	*34.14*	*34.22*	34.30	34.20	34.80	35.30
Cochise, AZ	36.90	*37.50*	*38.10*	*38.70*	*39.30*	39.90	38.70	39.80	40.00
Pima, AZ	35.70	35.60	36.10	36.00	36.10	36.30	36.60	36.80	37.10
Santa Cruz, AZ	31.80	*32.05*	*32.30*	*32.55*	*32.80*	*33.05*	33.30	34.20	34.80
Dona Ana, NM	30.20	*30.50*	*30.80*	*31.10*	*31.40*	31.70	30.70	31.30	31.10
Hidalgo, NM	34.80	*35.47*	*36.13*	36.80	*37.47*	*38.14*	38.80	39.20	39.30
Luna, NM	36.70	*36.67*	*36.63*	36.60	*36.57*	*36.53*	36.50	37.30	37.60
Culberson, TX	32.80	*33.85*	*34.90*	*35.95*	*37.00*	*38.05*	39.10	40.60	41.70
El Paso, TX	30.00	30.00	30.90	30.40	30.50	30.90	30.60	31.30	31.20
Hudspeth, TX	30.20	*30.83*	*31.47*	*32.10*	*32.73*	*33.37*	34.00	35.40	37.70
Brewster, TX	36.20	*35.99*	*35.77*	*35.55*	*35.33*	*35.12*	34.90	34.80	35.20
Jeff Davis, TX	42.50	*42.60*	*42.70*	*42.80*	*42.90*	*43.00*	43.10	44.60	44.90
Presidio, TX	32.80	*33.17*	*33.53*	*33.90*	*34.27*	*34.64*	35.00	36.50	37.40
Terrell, TX	42.00	*42.52*	*43.03*	*43.55*	*44.07*	*44.59*	45.10	46.50	46.70
Kinney, TX	43.20	*43.09*	*42.97*	*42.85*	*42.73*	*42.62*	42.50	42.80	44.40
Maverick, TX	27.80	*27.98*	*28.17*	*28.35*	*28.53*	*28.72*	28.90	29.50	29.50
Val Verde, TX	30.80	*31.18*	*31.57*	*31.95*	*32.33*	*32.72*	33.10	33.90	34.50
Starr, TX	26.10	27.20	*27.02*	*26.84*	*26.66*	*26.48*	26.30	26.50	26.60
Webb, TX	26.50	*26.50*	*26.50*	*26.50*	*26.50*	26.50	26.00	26.20	26.20
Zapata, TX	30.70	27.20	*27.64*	*28.08*	*28.52*	*28.96*	29.40	29.60	29.60
Cameron, TX	29.00	28.90	29.40	28.60	28.90	28.50	28.80	28.70	28.90
Hidalgo, TX	27.20	27.00	27.00	27.00	27.10	26.90	27.10	27.30	27.60
Riverside, CA	33.10	32.50	32.50	32.50	32.20	32.20	31.70	31.50	31.70
La Paz, AZ	46.80	*47.20*	*47.60*	*48.00*	*48.40*	*48.80*	49.20	50.70	51.70
Graham, AZ	30.90	*31.05*	*31.20*	*31.35*	*31.50*	*31.65*	31.80	31.90	31.30
Greelee, AZ	33.60	*34.22*	*34.84*	*35.46*	*36.08*	36.70	37.30	37.90	37.80
Maricopa, AZ	33.00	32.50	32.90	32.80	33.00	33.40	33.70	33.90	34.10
Pinal, AZ	37.10	*36.68*	*36.26*	*35.84*	*35.42*	35.00	34.10	33.10	32.50
Grantt, NM	38.80	*38.80*	*38.80*	*38.80*	*38.80*	*38.80*	41.80	42.20	42.10
Otero, NM	33.80	*33.80*	*33.80*	*33.80*	*33.80*	*33.80*	35.40	36.10	36.50
Sierra, NM	48.90	*48.90*	*48.90*	*48.90*	*48.90*	*48.90*	49.10	49.90	49.70
Pecos, TX	31.20	*31.20*	*31.20*	*31.20*	*31.20*	*31.20*	32.30	32.70	32.30
Reeves, TX	32.10	*32.10*	*32.10*	*32.10*	*32.10*	*32.10*	35.80	37.40	37.60
Crockett, TX	37.20	*37.20*	*37.20*	*37.20*	*37.20*	*37.20*	40.00	40.80	39.40
Edwards, TX	39.00	*39.00*	*39.00*	*39.00*	*39.00*	*39.00*	36.90	35.00	33.10
Dimmit, TX	31.60	*31.60*	*31.60*	*31.60*	*31.60*	*31.60*	32.30	33.60	33.90
Sutton, TX	36.50	*36.50*	*36.50*	*36.50*	*36.50*	*36.50*	35.10	35.30	35.80
Zavala, TX	29.00	*29.00*	*29.00*	*29.00*	*29.00*	*29.00*	29.20	29.40	29.30
Uvalde, TX	32.20	*32.20*	*32.20*	*32.20*	*32.20*	*32.20*	32.70	33.10	33.40
La Salle, TX	33.00	*33.00*	*33.00*	*33.00*	*33.00*	*33.00*	33.50	33.30	34.00
Duval, TX	33.80	*33.80*	*33.80*	*33.80*	*33.80*	*33.80*	35.40	36.30	36.70
Jim Hogg, TX	33.90	*33.90*	*33.90*	*33.90*	*33.90*	*33.90*	36.60	37.90	37.60
McMullen, TX	43.10	*43.10*	*43.10*	*43.10*	*43.10*	*43.10*	43.70	44.80	46.80
Brooks, TX	34.40	*34.40*	*34.40*	*34.40*	*34.40*	*34.40*	34.80	35.60	35.60
Kenedy, TX	34.20	*34.20*	*34.20*	*34.20*	*34.20*	*34.20*	37.60	39.30	39.80
Willacy, TX	29.80	*29.80*	*29.80*	*29.80*	*29.80*	*29.80*	30.10	30.60	31.10

Note: Numbers in italics were extrapolated from actual numbers using U.S. Census Bureau data.

Appendix 2. Definition of Violent and Property Crimes.

The FBI's UCR Program defines each one of the violent crimes as follows: murder and non-negligent manslaughter is the willful (non-negligent) killing of one human being by another; forcible rape is the carnal knowledge of a female forcibly and against her will. Attempts or assaults to commit rape by force or threat of force are also included; however, statutory rape (without force) and other sex offenses are excluded; robbery is the taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or threat of force or violence and/or by putting the victim in fear; aggravated assault is the unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily injury (FBI, 2010).

The FBI's UCR Program defines each one of the Property crimes as follows: burglary is the unlawful entry of a structure to commit a felony or theft; larceny-theft is the unlawful taking, carrying, leading, or riding away of property from the possession or constructive possession of another; motor vehicle theft is the theft or attempted theft of a motor vehicle (FBI, 2010). Arson may be included in property crimes; however we excluded it from our analysis given the weak found the link between immigration and this crime to be weak. In addition to having only limited data on arson, different law enforcement agencies collect this data in different ways.

Apendix 3. Correlation matrix for apprehensions and control variables.

	APH	EDU(2)	MAGE	MAGESQ	METRO	EMP(3)	PCPI(4)	ENF(2)	ENFD(1)
				Correlation matrix					
APH	1.0000								
EDU(2)	-0.0121	1.0000							
MAGE	0.1645	0.1101	1.0000						
MAGESQ	0.1696	0.1311	0.9967	1.0000					
METRO	-0.1948	-0.3588	-0.4737	-0.4665	1.0000				
EMP(3)	-0.0365	-0.1050	0.4468	0.4407	-0.1948	1.0000			
PCPI(4)	-0.1931	-0.2516	0.4031	0.3885	0.1707	0.6784	1.0000		
ENF(2)	-0.1341	0.3077	0.1807	0.1809	-0.3207	0.2633	0.0754	1.0000	
ENFD(1)	0.1466	-0.0682	-0.0055	-0.0068	-0.0557	0.088	0.027		1.0000

Estimations run using E-views software.

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