The Spillover Effects of Conflict on Economic Growth Along the U.S.-Mexico Border

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THE SPILLOVER EFFECTS OF CONFLICT ON ECONOMIC GROWTH
ALONG THE U.S.-MEXICO BORDER

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Dedication

I dedicate this to my family for always teaching me what hard work is through example and for continuously believing in me and my work during the times I did not.
THE SPILOVER EFFECTS OF ECONOMIC GROWTH ALONG THE U.S.-
MEXICO BORDER

by

KAREN TREVINO, M.A.

THESIS

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Abstract
The violence and insecurity that Mexico has suffered since former President Calderon’s war on drugs has come at a grave economic cost to the cities most affected. Businesses and citizens in counties that shared a border with the United States, however, have the ability to move their capital and businesses in search of regaining profits that had been lost due to the insecurity in their cities. These specific counties are considered to be interdependent borderlands, which signify that these borders are in a border region where one nation is symbiotically linked with the border region of an adjoining country. This research seeks to show that increased border violence causes a positive economic spillover in the interdependent borderland by exploring the relationship between violence in one border city and economic growth in the neighboring city for six Mexico-U.S. border counties from 2005 to 2011. This study will be tested with a linear regression with panel-corrected standard errors using lagged dependent variables. The independent variables consist of organized crime related homicides, kidnappings, and extortions. The dependent variables consist of gross total sales, gross retail sales, taxable sales, taxable retail sales, accommodation/food service sales, and total establishments. The study controls for unemployment rates due to the recession the U.S. suffered during the time of the study.
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Introduction: The Reality of the Drug War in Mexico

The instability that wreaked havoc on Mexico due to the 2006-2011 drug war devastated cultural and economic conditions in the cities that suffered the ultimate surge in violence. Public life moved indoors with many individuals refraining from doing everyday activities in fear of becoming a casualty to the drug violence. Such violent spurts in regions like the Mexico-United States border have a distinct effect on the economic activity of the region compared to locations where violence is contained completely within a country. Significant interest on this subject has inspired a large amount of literature contemplating the effects of such violence on not only a country suffering the instability, but also its effects on the surrounding states in the region. The findings show a reoccurring pattern indicating a negative relationship between violence or instability and economic growth in a region. However, recent studies focusing on the Mexico-U.S. border are finding that the characteristics of the human capital and investment fleeing the violence has changed, suggesting the possible existence of a positive relationship between the upsurge in violence and economic growth for U.S border counties. This study has been undertaken to investigate this possibility and fill the potential gap in research between instability and economic growth in interdependent regions. Because this uniquely positioned region is highly interdependent both economically and culturally, this study will only be focusing on the Mexico-U.S. region.

1.1 Background

Organized criminal violence on the border was not a simple phenomenon that could be fixed simply by improving the security conditions of the communities affected. Mexico suffered from numerous contributing factors that set it up to suffer as harshly as it did from the violence. One factor that may have contributed is the rapid industrialization of Ciudad Juárez. The industrialization thanks to NAFTA and the maquiladora sector drew thousands of people from all areas of Mexico to seek work in these cities while the cities did not have the proper civic or
social infrastructure to support them (O’Rourke and Byrd, 2011). An absence of respect for rule of law can also be seen as a contributing factor. As Guillermo Zepeda Lecuona stated (2002);

“In Mexico, illegality appears to be a constant. There is no absolute divorce between norms and daily conduct. We live with habitual legal uncertainty and insecurity. The strategy which dominates relations between citizens is that of non-compliance with agreements.”

Aside from the combination of both of these factors, perhaps the most destructive influence of all was the drug supply and demand relationship Mexico held with the United States. The nature of the violence between organized crime cartels in Mexico manifested itself due to the government crackdown on cartels and the struggle to control major smuggling routes into the United States. According to the Central Intelligence Agency, the United States is the largest consumer of Colombian-produced cocaine and heroin as well as Mexican-produced heroin and marijuana (U.S. Central Intelligence Agency, 2014). The expectation with the heavy flow of drug trafficking into the United States would be that along with the drugs, violence would also spillover into the same border cities initially receiving the drug shipments. However, as Joseph M. Arabit Special Agent in Charge of the El Paso DEA division stated, “Mexican trafficking organizations understand that intentional targeting of U.S. persons or interests unrelated to the drug trade would likely undermine their own business interests.” For cartels, carrying out the same acts of violence in the United States as they do in Mexico would cause a strong response from federal law enforcement, something that would be detrimental to a cartel’s business and profits.

1 Guillermo Zepeda Lecuona, La Bancarrota Jurídica del Estado Mexicano, El Economista, May 14, 2002
1.2 Violence in the Border

Citizens and visitors of Mexican border cities were accustomed to hearing about drug violence prior to the peak of the violence and had the ability to dismiss it by simply telling themselves that such things only happened to those involved in criminal activities. That quickly changed after 2008 when the violence was affecting men, women, elderly, and the young alike and the violence was becoming more gruesome than ever before. It is estimated that in the case of Ciudad Juárez, Chihuahua around 1,623 people were murdered in the year 2008 alone (O’Rourke and Byrd, 2011). This increase sent a wave of fear into the citizens of Juárez and the surrounding areas. It is even rumored that by the end of 2008 the mayor of Ciudad Juárez himself was living in El Paso, Texas. During this time of uncertainty and fear, the majority feared falling casualty to the violence. Homicides also quickly opened the door to other crimes such as extortion and kidnapping. In the year 2011, Carlos Gutierrez, a Mexican citizen residing in the state of Chihuahua, petitioned for asylum after four men kidnapped him and amputated his feet after he refused to pay extortion fees. There are many more stories similar to the one of Carlos Gutierrez that added fuel to the fear of Mexican citizens, business owners, and tourists across the border who frequented Mexico.

With business owners living in risk of suffering a fate similar to that of Carlos Gutierrez or having to pay unreasonable extortion fees, many businesses were forced to close down. Understanding the violent environment many of these businesses were forced to operate in, helps the reader to see from the eyes of a rational firm seeking to stay afloat and maintain profits. Also, by understanding the volume and frequency of Mexican drugs trafficked through the U.S. border helps to put in perspective the openness of the border. As it will be discussed further in the next chapter of this thesis, the economic interdependence characteristic of the border provides a unique landscape for those escaping or fleeing the violence. Therefore, this study seeks to investigate if this occurrence affected the economy of the U.S. border counties due to their proximity to the violence.
1.3 Thesis Roadmap

This thesis proceeds as follows. First, I will review the literature on the effects of political and criminal instability on economic growth, particularly the effects on migration and human capital, and immigration patterns and characteristics. The subsequent chapter will discuss the theoretical framework employed—which is a merger of theories establishing the link between domestic political instability and economic growth, the exit, voice and loyalty theory, theories suggesting the importance of spillovers arising from geographical proximity, and lastly broader new economic geography theories—followed by a discussion of my methodological approach. Thereafter, empirical results will be discussed. The last section offers a conclusion.
The Influence of Instability on Growth

Since the year 2000, the U.S. has experienced a decrease in the number of Mexican immigrants migrating into the country with the exception of U.S. border cities (Rios, 2011). As opposed to the immigrants who commonly migrate with economic motives, the new migrants are affluent refugees from the drug-war that has ravaged Mexico. This drug war has ushered in an era of anti-drug war policy that “has resulted in the creation and consolidation of a few large drug cartels” (Payan, 2006). This consolidation has escalated the violence between cartels competing for turf not only through drug-related homicides but also through extortions and kidnappings, deeply affecting Mexico’s border cities’ economic growth. Drug-related violence gives rise to more criminal offenses of all types in Mexican states that border the United States (Liu, Fullerton, and Ashby, 2012). However, although violent crime can be viewed as an antithesis for economic growth, this violence in Mexico is forcing human capital and businesses to flee to neighboring U.S. counties.

In an ever increasing globalized world, issues with security can have an impact not only on the countries experiencing difficulties, but also those states that associate with them whether through geographic proximity or economic ties. Its effects have provided rich grounds for research regarding the correlation between political instability and economic growth. Scholars have offered several theories to account for how a country’s instability causes a decrease or increase in economic growth. The two major schools that investigate this relationship differentiate in whether they argue if conflict is negative or positive for growth. While existing literature investigates the effects of this relationship on a domestic and regional scale, this thesis seeks to answer if a positive or negative relationship exists between violence in one city and economic growth in the neighboring city located in interdependent borderlands.
2.1 **Political Instability and Economic Growth**

The study of the effects of political instability and organized crime on economic growth is not a novel field of research. Although both use different proxies due to the nature of their conflicts, both have similarities that apply to the instability being discussed in this study. The definition for political instability and economic growth has differed in the literature. Proxies for political instability can range from politically motivated events to crime indicators separate from political agendas. Several scholars see political instability as drastic government changes usually involving some form of violence that can include: successful and attempted coups d’états, political assassinations, guerilla warfare, secession movements, revolutions, civil wars, major government crises, large scale antigovernment riots, politically motivated strikes, major constitutional crises, abrupt and unusual constitutional changes, and/or purges and plots (Gymiah-Brempong and Munoz de Camacho 1998, Ades and Chua 1997). Scholars such as Alesina, Roubini, and Swagel interpret political instability as the propensity of a change in the executive power either by constitutional or unconstitutional means (1996). Other scholars however, provide a more fitting definition using homicides as a proxy for instability. Out of all crime indicators, homicides are the most reliably measured indicator across nations (Alvarado and Massey, 2010). In addition, because homicide is such a sensational event, it is bound to be salient to decision makers and individuals contemplating to flee from the violence (Alvarado and Massey, 2010). In the case of the Mexico-U.S. border, this is the most fitting way to define or measure instability because the crackdown of the drug war “debilitates the “incumbent drug lord” and generates incentives for rival drug cartels to fight for turf resulting in high homicide rates between members of cartels (Arceo-Gomez 2012, 211). Different from political instability, organized crime is recognized by a defined set of characteristics that include the following elements: “1) they act in defined geographical area where there is state vacuums; 2) they are
involved in multiple legal and illegal activities; 3) they develop forms of coordination, characterized by long-run horizon and different types of hierarchical structures; 4) they use violence or the threat of violence in order to achieve a local control and promote their business (Detotto and Otranto, 2010).”

Economic growth has been more consistently defined. Determining growth with per capita GDP is the most common proxy followed by growth rates of capital, labor and exports (Alesina, Roubini, and Swagel 1996, Ades and Chua 1997, Gymiah-Brempong and Munoz de Camacho 1998). However, studies with a focus on the border region have used a more direct and narrow approach to measure economic growth, such as documenting the changes in the openings of businesses in the counties along the U.S. border. This is an extremely useful measure but leaves one very important element out. This measure can usually be linked to the wealthy and affluent of the Mexican region that has the ability to open businesses and enhance the U.S. economy. However, it leaves out the individuals who do not have the resources to relocate completely yet still often cross to shop or carry out recreational activities that they can no longer do in their respective cities. This facet of economic growth can perhaps be complemented through a gross retail sales variable.

2.1.1 Direct and Indirect Effects on Economic Growth

It is theorized that political instability has a harmful effect on economic growth both directly and indirectly. Border metropolitan areas tend to be very economically intertwined in different ways. U.S. border cities with large retail sectors tend to be more integrated with the Mexican economy while Mexican cities with a large maquiladora sectors are more integrated with the U.S. economy, but nonetheless changes in one economy will affect the other (Phillips and Cañas, 2008, Niño, Coronado, Fullerton, Walke 2013).
For one, political instability affects economic growth by increasing policy uncertainty resulting in negative effects on investment and saving decisions (Alesina, Ozler, Roubini, and Swagel 1996, Ades and Chua 1997). Conflict signals to potential investors to actively avoid investing in a country suffering from instability (De Groot, 2010). This may also negatively affect neighboring countries since investors may also fear the possibility of a negative spillover into the neighboring country or the possibility of a direct contiguous, or primary, neighbor getting involved (De Groot, 2010). Decisions of investment are especially crucial in regions like the Mexican-U.S. border, where investment and trade has grown considerably since NAFTA, and any uncertainty in security is of concern to the economies of both countries. It has also been found that the majority of Mexican visitors to the U.S. arrive with the purpose of shopping, creating a large retail sector in border economies (Ghaddar and Brown, 2005).

It has been estimated that Mexican visitors’ expenditures along the U.S.-Mexico border generate eight to nine billion dollars in output, helping support more than 150,000 jobs (Ghaddar and Brown, 2005). This already prosperous retail sector output is further increased when Mexico experiences violence. Industries such as automobile dealerships, gas stations, restaurants, and general stores have consistently had high profits due to border commerce (Fuentes, Cervera, and Peña, 2007). Increased drug war murders have been found to reduce retail activities domestically (Niño, Coronado, Fullerton, and Walke, 2013) leaving displaced shoppers to cross the border for safer retail centers. In addition to the correlation between the drug war homicides and reduced retail activity, extortion and attacks on businesses further stifle retail activity in Mexico benefiting the retail sector in the U.S. border cities. Also, increased levels of violence and instability discourage U.S. residents from crossing the border to shop for common goods like cheaper medicines and/or medical services driving these U.S. residents to obtain these goods in
their respective cities. Perhaps one of the major indirect consequences that can come from political instability is that it has been found to decrease investment in both human and physical capital as shown in the studies regarding migration (Gymiah-Brempong and Munoz De Camacho 1998, Ades and Chua 1997, Rodriguez and Villa 2012, and Arceo-Gomez 2012).

2.2 **Criminal Instability and Economic Growth**

Although they do have similarities, existing literature on crime differs from literature on political instability. Much like the effects of political instability, organized crime acts like a tax on the entire economy by discouraging domestic and foreign direct investments, reducing the competitiveness of firms and most importantly, by reallocating resources, creating uncertainty and inefficiency in the economy (Detotto and Otranto, 2010). Organized crime has the influence to affect the economy because it is not confined solely to illegal or underground markets, but it interacts with the private and public sectors of the legal economy (Capuano and Purificato, 2012). The multifaceted dimension of organized crime allows them to tap in through legal sectors, usually for criminal revenues to be laundered (Capuano and Purificato, 2012). As mentioned previously instability increases policy uncertainty which is further increased with organized crime in places with weak or absent institutions. Weak institutions allow organized crime to replace the state in the protection of property rights which is usually done through one of its main revenue-making elements, extortion (Capuano and Purificato, 2012). Another major way in which organized crime infiltrates the legal economy is through the bribing of public officials. Although it may seem that the corruption of public officials does not directly affect the legal sector income, scholars, such as Del Monte and Papagni, have found positive correlations between corruption and crime indexes and between corruption index and public expenditures in their case study of Italy (Capuano and Purificato, 2012). In the case of Mexico, public officials
being bribed can often be police officers, allowing organized crime to expand their illicit activities further increasing policy uncertainty.

2.2.1 The Case of Italy

This has been shown through the interesting case study of Italy, which not only accounts for about one-tenth of all crime offenses in the European Union, but historically Italian crime has been characterized by a strong incidence of organized crime (Detotto and Otranto, 2010). Scholars Claudio Detotto and Edoardo Otranto have investigated how crime affects economic growth using the Italian example and their findings can be translated to the case of the Mexico’s instability. Their study shows that the annual per capita income growth of Italy is negatively affected by murders after controlling for other explanatory variables. The study used very similar variables with common weaknesses. Much like the case for Mexico, the study used homicides as a proxy for crime data, as it is the most reliable. The data was obtained from police reporting activity which suffers from the same weakness as Mexican homicide data, which is the underreporting bias (Detotto and Otranto, 2010). Aside from finding a negative relationship between crime and growth, the study also produces some interesting findings in regards to the cyclical patterns in which growth is more frequently affected by crime. Although the authors find that economic performance was affected by crime during their entire sample period, Italian economic performance was more strongly negatively affected during recessions than expansions (Detotto and Otranto, 2010). This does not necessarily occur because the level of criminal activity increases, but it is strictly related to the economic business cycle. This finding is important because it affects two other elements in the economic health of a state. As mentioned previously, organized crime imposes a cost to the legal activity of a state’s economy, therefore their impact is felt more during recessions. While economic growth is slowing down, resources
needed for economic recovery are being diverted by organized crime, whether in the form of fighting them or through corruption (Detotto and Otranto, 2010). Lastly, the income being drained from the legal sector is not being reused in the same sector (Capuano and Purificato, 2010). This finding resonates with the case of Mexican border cities with the exception that not all the income is being drained, but some of it is fleeing. In the case of Italy, the revenue that is not being used in the same local sector of the economy is being used to “cover operating expenses, replenish inventories, purchases the services of corrupt officials to escape detection and further the interests of the illegal enterprise, and pays for an extravagant lifestyle (Capuano and Purificato, 2010).” For Mexican border cities, having the illegal revenue not stay in the same sector in addition to the fleeing of businesses and human capital further devastates and slows down the economy.

2.3 CONFLICT AND MIGRATION

Previous literature has shown that non-state actor’s behavior, such as violence, is causing citizens to migrate to safer locations, like in the case of Colombia and Mexico (Rodriguez and Villa, 2012, Rios, 2011). This argument speaks specifically to broad political science theories of the impact that non-state actors have on shaping decisions taken by state member’s to explain how the drug related violence in Mexico has pushed economic actors out of Mexico and into border cities. In explaining the factors that affect the economic growth of a city due to a spillover, one finds that most of the factors, such as refugees opening businesses or customers crossing over for a safer retail experience, are driven by a force outside of the state’s control, which in this case is drug related violence. It is often argued in the field of international relations that the state does not solely dominate in international relations. Non-state actors and economic interdependence have caused “states to retain their legal sovereignty but at the price of a slight
loss of autonomy” (Hollis and Smith, 1990). This logic can be used to understand dynamics of citizens leaving their homes and businesses in Mexico and fleeing to the United States, therefore investing in the U.S. economy as a consequence.

2.3.1 Return Migration

Although work on the subject of return migration in the context of the drug war is not widely available, existing return migration studies are guided by the neoclassical economic choice theory. This predicts that migration occurs when expected earnings or possible employment in the destination county exceed earnings in the source country net of migration costs (Van Hook and Zhang, 2011; Mendoza Cota, 2006). Besides economic integration and benefits being one of the more salient factors in immigrants deciding to stay, social capital plays a significant role in an immigrant’s choice to emigrate or not. Decisions to migrate are no longer coming solely from an individual economic standpoint. Now, a deciding factor seems to be the home and family structure of the individual (Mendoza Cota, 2006). In a study conducted by El Colegio de La Frontera Norte, findings determined that during 1997-2002 61.6 percent of migrants did not return to Mexico, while 38.4% of this migration was estimated to be cyclical (Mendoza Cota, 2006). Using this theory in the case of Mexicans, affluent or not, staying in the United States, it can be concluded that it depends on the economic opportunities and ties of the individual. Also, immigrants who cross illegally have an additional issue to consider. Crossing the border illegally has become more unpredictable than ever as the border landscape is quickly changing. Border crossing has seen the emergence of coyotes working for the drug cartels and economic migrants are often exposed to drug traffickers (Slack and Whiteford, 2013). With the risk of having to deal with the unpredictability and ever increasing dangers of having to cross

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2 Coyote is the word used to refer to a human smuggler (Slack, Martinez, Whiteford, and Peiffer 2013).
again, economic migrants without the resources to cross legally may choose to stay regardless if the expected earnings in the U.S. do not drastically exceed the earnings in the source country.

2.3.2 Characteristics of Migrants

Conditions that create refugee flows can pose major threats to human security when large groups are forced to abandon their communities. This type of forced migration poses social and economic issues for the conflict host state. The non-economic variable of violence also depends on the characteristics of the location and conflict. Such was the case in Guatemala since 1966 where fear of death from political violence played a key role in many individuals’ migration decisions (Morrison, 1993). The most common type of migration occurs due to economic reasons; however, economic migration is an individual based decision as opposed to migrating for violent reasons, which is the chief cause for large refugee flows. Cases such as those of Afghanistan, Rwanda, and the Sudan have caused refugees to flee from war torn areas and are posed with the difficult decision of not only migrating, but deciding where to migrate to (Iqbal, 2007). This is a very different case from what Mexicans migrating into the U.S. experience. Mexican migrants are not presented with the challenge of deciding what location to migrate to because the proximity to the U.S. and its economy make it an attractive host state. This proximity not only offers convenience but it also allows the person migrating to preserve their social capital in their respective state. Choosing a host state also has to do with the profile of the person migrating. In the example of Africa, primary or contiguous neighbor states tend to suffer from negative economic growth because they host the bulk of refugees from its unstable neighbor and these particular refugees tend to be unskilled or poor (Olaf J. De Groot, 2010). The secondary neighbors on the other hand, actually receive refugees who are more likely to have a higher level of human or physical capital (Olaf J. De Groot, 2010). Because the surroundings of
Mexican border cities are limited proximity wise to the U.S. or migrating internally, a bulk of the persons migrating, who are considered affluent, end up migrating into the United States.

The most crucial aspect of this finding as it relates to the U.S.-Mexico border is the characteristic of the citizen who is forced to migrate. The influx of immigrants in the U.S. can be characterized by low to middle income individuals often in search of better job opportunities, not because of security issues. This reoccurring non-economic variable can often be found in cases of mass migration. Such was the case in Guatemala since 1966 where fear of death from political violence played a key role in many individuals’ migration decisions (Morrison, 1993). Migration patterns in locations ravaged by organized crime are increasingly finding that migrants in search of safer locations due to either political instability or violence are more affluent. In the case of Colombia, kidnappers targeted those with the capacity to pay a ransom. Findings indicated that households with the potential to be a kidnapping target often migrated to an international location (Rodriguez and Villa, 2012). The migrants fleeing Colombia were found to be wealthier and more educated risking Colombia’s economic development due to the loss of human capital. These findings can be applied to the case in the Mexico-U.S. border cities, which suffer not only from the risk of kidnapping but also face constant extortion often making businesses unsustainable. Instead of migrating internationally, like in the case of the affluent in Colombia, Mexican citizens are provided with an economic outlet thanks to geographic proximity with the U.S. Even when controlling for general homicide in a county, drug related violence is found to significantly push migration (Rios, 2011). The Colombian case explores migration just by differing domestic and international migration, therefore because the migration is not concentrated in one specific region, surrounding primary neighbors do not benefit from Colombia’s fleeing human capital. Migration into border cities is significantly more concentrated
than in the case of Colombia because migration to a border city is more accessible. For example, it is estimated that Juárez has lost about eleven 11 percent of its population, and other border cities suffering violence such as Tijuana, Reynosa and Matamoros have each respectively lost six, nine, and four percent respectively of their population during the same time period (Rios, 2011). While it is impossible to calculate the total, preliminary figures have estimated that at least 50 percent of them have migrated to the U.S. (Rios, 2011). Mexicans with a Border Crossing Card can cross the border and travel up to 25 miles into the U.S. without an I-94, further facilitating migration and allowing those without the resources to still cross and purchase goods in the neighboring city (Arceo-Gomez 2012, 212). Previous studies show that primary neighbors are likely to suffer from a bulk of refugees, the majority of which are unskilled and poor, which negatively influences the neighboring country’s economic growth (De Groot, 2010). In the case of the U.S.-Mexico border however, the findings for this region echo those found in the case of Colombia: college-educated individuals are fleeing the violence in Mexico (Arceo-Gomez, 2012). This migration of the most qualified section of the labor force has a directly negative effect on the economic decisions and development of the Mexican border region but is advantageous to the U.S. side (Ades and Chua 1997, 280).

With the migration of the affluent and educated, economies experiencing instability are suffering from capital flight. The definition for capital flight usually indicates “the exodus of capital, often through surreptitious means, from developing countries to more advanced, industrialized countries (Fatehi, 1994). In the case of Mexican border cities, capital flight is not necessarily happening because Mexico is significantly less advanced than the U.S., but instead it is occurring because the instability hampers the further development of the economy causing capital to look for alternative outlets for growth. Studies that have previously been conducted on
the phenomena of capital flight have analyzed it from a political risk and instability perspective as opposed to a criminal instability perspective. A definition commonly used to define political stability can actually be used to describe the social and criminal instability this study focuses on. In reference to capital flight, political stability is simply defined as “the absence of disturbances and violence in the society” (Thunell, 1977). In the case of capital fleeing Mexico, it is important to note that the capital fleeing was mostly from local residents as opposed to foreign investors. Local residents are better positioned to respond to the emergence of instability symptoms. Local residents are able to respond faster to disturbances because they have direct access to first-hand information and can analyze the impact of these events (Fatehi, 1994).

2.4 INTERDEPENDENT BORDERLANDS AND GEOGRAPHIC PROXIMITY

This thesis looks to fill the gap in the area of geographical proximity, which will possibly yield different results from previous work done on the subject. Researchers agree that regional instability in neighboring countries has an adverse effect on a country’s economic performance, just as if the instability was happening domestically (Ades and Chua, 1997). However, often the findings reflect that the spillover experienced by a neighboring primary country will usually be a negative one. The findings reflect this because of the way the regions in previous literature are operationalized. These models cannot be applied as a “one size fits all” model when one considers the nature and characteristics of specific regions. Scholars whose findings support the idea that instability causes a regional negative spillover, commonly focused on distance between capital cities and intellectual spillovers between industries in the same cities, while the thesis will narrow the focus to adjoining integrated Mexico-U.S. border cities (Ades and Chua, 1997). Other ways of defining regions by approaches such as language, colonial linkages, a customs union, or common currency have been previously considered in other works but have been criticized for
subjective selectivity (Ades and Chua, 1997). However, in many situations, like in the case of the U.S.-Mexico border, such different approaches must be included in order to correctly interpret the relationship between violence and growth in a specific region. When studying spillover effects in neighboring countries in Africa, Olaf J. De Groot describes three possible types of nations: host nations, directly contiguous nations (primary neighbors), and nations that are near to a conflict nation but not contiguous (2010). Directly contiguous or primary nations are the ones whose growth is most significantly impacted by conflict and the type that will be used in this study. The geographic proximity and accessibility between the borders in this region is what makes it particularly interesting and different from other regions in previous studies.

Not all neighboring countries and regions have the same relationships or commonalities. Oscar Martinez creates a typology that describes four models of borderland interaction: alienated borderlands, coexistent borderlands, interdependent borderlands, and integrated borderlands (1994, 6). Interdependent borderlands, what Mexico-U.S. border cities are considered, are areas where “a border region in one nation is symbiotically linked with the border region of an adjoining country” (Martinez, 1994). Regardless of the inequality between these interdependent economies, “the productive capacity of the wealthier country is often matched with raw materials and cheap labor in the poorer nation” which yields proportional benefits to each side (Martinez, 1994).

2.4.1 Economic Interdependence

It is worth pointing out that although both economies have complementary economic linkages and are considered to be interdependent, the openness of each dyad has for the other is often asymmetrical. Literature on the openness of borders finds that wealthier states tend to impose more restrictive entry policies to poorer neighboring states (Boehmer and Peña, 2012).
For example, regardless of Mexico being a NAFTA trading partner and having peaceful relations with the U.S., the entry policies are more restrictive towards them than Canada. The entry policies are more restrictive because of Mexico’s asymmetry in development in comparison to the United States, causing the restrictions to be in place to deter people who may overstay their visas (Boehmer and Peña, 2012). Although in the case of the United States the country has different options as far as visas are concerned depending on income and education, one can see how lower income individuals may not be able to attain a non-immigrant visa supporting the idea that the individuals that are migrating range from middle to high income.

Geographical proximity and productivity differences have caused the economies of the U.S.-Mexico border to have evolved complementary industrial linkages which have been further intensified since the North American Free Trade Agreement (Nino, Coronado, Fullerton, and Walke, 2013). Existing literature dictates that the spatial geography of borders, specifically their proximity, predicts larger flows of people, goods, and investment concentrated in borderlands (Boehmer and Peña, 2012). However, not all the economic processes that occur in a borderland necessarily intertwine the economies of both countries. Binational economic components consist of cross-border\(^3\) and transnational processes. The former takes place on a regional scale where economic practices are contingent on the spatial contiguity of both countries which allows the intensifying of the economic nexus between border cities (Fuentes, Cervera, and Peña, 2007). Such processes include the maquiladora industry, transmigration\(^4\), and retail commerce. The existence of transnational processes’ existence on the other hand does not depend on a border location. Instead the border just serves as passing point and its importance is short term. Such

\(^3\) Cross-border is the translation being used in place of transfronterizo, which in this context refers to economic practices taking place between the border city of one country and its contiguous counterpart (Fuentes, Cervera, Peña, 2007).

\(^4\) Transmigration refers to the act of an individual working in one country and living in the neighbor country while crossing the border daily (Fuentes, Cervera, Peña, 2007).
processes include international migration or trade whose origin and destination goes beyond the border. The importance of the cross-border economies in border cities is exceptionally visible in locations like the U.S.-Mexico border, where large quantities of trans-migrants cross every day. The flow of these individuals who cross back and forth daily has been further facilitated by initiatives such as “línea express”, a special line in ports of entry designed to facilitate entry to low risk border residents (Fuentes, Cervera, y Peña, 2007).

Because the economies of both neighboring regions are intertwined through these previously mentioned cross-border and transnational processes, a negative economic spillover is less likely to occur than in other more hostile border regions due to the fact that one of the economies is bound to benefit from the disgrace of the other. This is something that scholars who argue that domestic instability causes a negative spillover in neighboring countries recognize and agree with under certain circumstances. They concur that there are instances when neighboring countries may benefit from the capital flight and migration of talented people and that there are cases in which countries may benefit from political unrest in neighboring countries (Ades and Chua, 1997). They believe this happens not necessarily when the borders are integrated but when the neighbors compete for a scarce pool of foreign capital allowing one of the rivals to get a larger share of the that pool (Ades and Chua 1997, 302).

Eva Olimpia Arceo-Gomez (2012) provides an approach similar to the one this thesis will utilize to determine 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 (2012, 212)”. The author documents changes in the opening of businesses in the counties along the U.S. border assuming that Mexican migrants are transferring or opening new businesses when migrating. Moving their businesses along with them is not something that has been extreme for many
Mexicans as many of their businesses were already targeted towards American consumers (Rios, 2011). Olimpia Arceo-Gomez also echoes the findings of previous scholars regarding intellectual spillovers. The author argues that college-educated immigrants are fleeing the country and leaving Mexico depleted of both human and physical capital. To account for this, Olimpia includes the variable of educational structure to determine if these are wealthier-than-average immigrants who have the capability and resources to open or move businesses into the border cities. This study also compiled data on businesses from the County Business Patterns series. Unfortunately, the only weakness, which the author does address, is that the data do not specify whether the business belongs to an immigrant. Despite this, the study’s results show that the growth rate of business establishments has been higher in border states than the rest of the United States despite the recession in 2008 (2012, 217). It has been estimated that 700 businesses closed in Nuevo Laredo alone in the year 2006 (Garza, 2009). The results also demonstrate that a 1 percent increase in the weighted homicide rates is correlated with a 0.57 percent increase of Mexican immigrants into the United States (2012, 219). Perhaps one of the most important and interesting findings is that one percent of the weighted homicide rate in Mexico produces an increase of 2.03 percent of the immigration of college-educated Mexicans in the southern border states (2012, 222). This supports the hypothesis that wealthier-than-average immigrants are fleeing the violence in Mexico this may result in an influx of human capital coming into the U.S. with the capabilities of helping to increase the border city’s economic growth. A similar approach will be taken in this thesis with several new variables including the addition of an extortion rate on top of the homicide rate. Although looking at the homicide rate worked as a successful indicator for this study, the fact that extortions are aimed at mostly business owners
and the wealthy should produce a higher influx of these certain individuals fleeing to the United States.
Conceptualizing Economic Spillovers: A Theoretical Framework

Since the World War II, a large majority of capital has become liquid and capitalists have been able to invest and move freely to wherever they see the greatest possible return on their investment (Leyshon et al, 2011). Therefore, when a city is suffering economically, in this case because of violence, consumers and business firms will seek to obtain services or maximize profits elsewhere. Understanding why businesses and customers leave in the first place is important to understanding how this can cause a potential economic spillover to neighboring cities, which in this case are across a border. The study uses an amalgamation of conceptual frameworks that serve as a lens to focus on the economic and geographic aspects of this research analysis. This study draws on neoclassical rational choice theory, exit, voice, and loyalty theory, new economic geography theory, and theories stressing the importance of spillovers arising from geographical proximity, as frameworks for this research. With these theoretical frameworks, this study examines why consumers and firms may have to exit their local economic system. These theories will also help to answer the following question, when violence deteriorates the market in a city, how do businesses and consumers react? The new economic geography theory and the theories claiming spillovers arise from geographical proximity the study will emphasize why when actors have to exit their own economy they look to the adjacent border cities to do it. As mentioned in previously in the study, this research seeks to show that increased border violence causes a positive economic spillover in the interdependent borderland by exploring the relationship between violence in one border city and economic growth in the neighboring city for six Mexico-U.S. border counties from 2005 to 2011. According to the theories that will be discussed, the expectation is that a positive economic spillover will occur.
3.1 Neoclassical Rational Choice

Neoclassical rational choice theory has long been accepted in traditional economic theory suggesting that actors behave rationally. Rational behavior simply implies that a consumer or firm desires to obtain a maximum of utility or satisfaction (Neumann, 1953; Becker, 1976). It is often rationalized that this utility and satisfaction are equivalent to a monetary commodity. The ways in which an actor may choose to reach the optimum position depends on the knowledge and understanding the actor has regarding the options open to him/her (Neumann, 1953). In broad terms, this emphasizes the question brought on by this study. If the economy of a city is deteriorating and hampering the maximization of utility and satisfaction due to reasons outside of the control of firms and consumers, it is only rational for these actors to seek maximizing a function in a more controlled environment.

This logic has been seen in the behavior of immigrants. When expected earnings or possible employment in the destination country exceed earning in the source country immigration will occur (Mendoza Cota, 2006). The same theoretical assumptions can be made regarding the question this study is posing. The violence that is devastating the U.S.-Mexican borderland during the drug war posed as a hindrance to the ability of firms and consumers to maximize their utility and monetary gains. This impediment was not a direct cause of the violent acts themselves, but what came with it. The insecurity caused by the violence instilled fear in the consumers who did not consume products or services from smaller firms out of concern for their safety. This same insecurity opened the door to crimes that directly affected the firms such as extortion and kidnapping. In the traditional model of the competitive economy, when a firm suffers from a lapse, it is not necessarily crucial for the firm to recover. This is because other firms are expected to take up the market share and its resources may be better allocated within those new firms (Hirschman, 1970). In the case of the economic state of the Mexican cities,
extortion can be seen as a repairable lapse if and only if the firm is wealthy and competitive enough to sustain the payments and benefit from the firms who are unable to meet such demands. In other words, extortion, or this lapse in profits and business, is nothing but an inconvenience or hiccup for business owners who have enough resources to cover the extortion and still run a profitable business. However, experience has shown that this was not necessarily the case in the Mexican northern border cities. Many of the firms that one considered to be competitive and wealthy enough to pay extortions and kidnapping ransoms while maintaining their firms open and profitable, either closed down or moved the business. This is because such rational choice situations are characterized by risk and uncertainty due to the firm not having complete information (Elster, 1986). The only fact a firm can be sure about is the amount it will have to pay, but for a business it remains uncertain to what extent extortion will affect its business. Extortion may act as an additional tax on firms by frightening customers who know about the business being threatened. In kidnappings, the uncertainty lies in the reality that there is no guaranteeing an actor’s safety during the kidnapping regardless if the individual can pay a ransom fee or not. Although the neoclassical rational choice theory does not explicitly take the following into account, an actor’s well-being is rationally above any monetary commodities. It is clear that the gains do not outweigh the risks and it is irrational for a firm to remain in the same location to try to continue with the lapse that is insecurity. This is what some economists refer to as the exit route.

3.2 Exit, Voice, and Loyalty

In any system, whether economic or governmental, there exist lapses and flaws in the behavior of institutions. Society has learned to live and operate with a certain level of dysfunction; however, when this dysfunction leads to general decay in an institution, society
must take steps to revert this misbehavior (Hirschman, 1970). Individuals in a society have the options to exit, voice their concerns, or wait it out. These concepts are commonly discussed in terms of the options the consumer has but are applicable to firms, government, and other organizations. In the case of this study the consumer as an actor is being replaced with the business community and the management with the state. With the exit option, some customers will stop buying the firm’s products or some members leave the organization. When this occurs and revenues substantially drop, management is forced to search for ways to correct what has led the customers to exit (Hirschman, 1970). When customers choose to voice their concerns instead, they express their dissatisfaction to management, to another authority, or through general protest. In the economic realm, voice is seen as cumbersome and ineffective and there is an inherent bias to favor exit. Both options have their merits under certain circumstances. In the case of the northern Mexican region, the violence has made it apparent that voice is not a viable option as it does not outweigh the risks associated with. To understand why this option is not viable we must first understand the more common and feasible option of exit.

3.2.1 Exit

The availability of the exit option is contingent upon having normal or non-perfect competition. In normal competition, firms and their competitor possess latitude as both price-maker and quality maker (Hirschman, 1970). A consumer exiting in response to price or quality therefore causes revenue losses and alerts management to repair its failings. In this scenario of normal competition, however, the latitude exogenous actors may have is not considered. To further elaborate, in the case of the northern Mexican border, availability replaced price and quality. For many firms, especially those involved in the nightlife or restaurant business, the availability of customers ceased. Not necessarily because the price or quality of the services
being provided is unsatisfactory, but because the firm is not able to provide the safety required for customers to enjoy their services. Availability also affects the consumer. With the loss of revenue and pressure from extortion demands, many firms are required to close the firm and less and less options are available for customers to choose from. This scenario causes both firms and consumers, to exit and seek to maximize their utility elsewhere or to voice their concerns to institutions capable of changing the situation. Aside from exit being the obvious choice for rational profit-seeking businesses, in the case of the U.S.-Mexico border, the element of proximity facilitates the choice to leave. The cost of exit in this border is minimal as far as cultural affinities are concerned. In the example of El Paso, Texas, which is contiguous with Ciudad Juárez, Chihuahua, the U.S. Census Bureau estimates that 73.6 percent of the population in the county speaks a language other than English primarily Spanish. The ability for business owners to leave to a location where they can conduct business in their native language, makes the option of exit that much more enticing.

3.2.2 Voice

Voice is defined as:

“any attempt at all to change, rather than to escape from, an objectionable state of affairs, whether through individual or collective petition to the management directly in charge, through appeal to a higher authority with the intention of forcing a change in management, or through various types of action is and protests, including those that are meant to mobilize public opinion” (Hirschman, 1970).

In the case of voice in the Mexican case, because firms are the members that have issues to bring up regarding the objectionable state of affairs, actors are left appealing to governmental institutions which are the only outlet available to bettering conditions. Voice allows actors to voice their concern to political elite or government, but in order for them to be responsive these elites must be allowed to make decisions (Hirschman, 1970). This is mainly why voice is not a
feasible option. The government does not have the capability of making decisions to better the conditions of both firms and consumers due to the risk involved. The government is either unable to control the actions of the organized criminal organizations or, as some citizens fear, the authorities may allegedly be involved in or aware of the activities themselves. In an article published by the Mexican paper newspaper, “Vanguardia”, a victim of extortion in the Mexican state of Guerrero expresses his fears regarding government involvement.5

Yo sólo confío en Dios, porque en el gobierno no. Ellos saben quiénes son y dónde están, pero no hacen nada, por eso todos tenemos miedo...- Señor Rodriguez

I only trust in God, because I do not trust the government. They know who they are and where they are but they do not do anything, that’s why we are all afraid- Señor Rodriguez

He expressed this sentiment of fear augmented after he and other businessmen in the area decided to finally voice their concern to the authorities. They went to their local authorities and spoke about the problem without officially filing reports. The businessmen allegedly claim that on the same day they spoke to the authorities, the individual who would gather the weekly cuotas6 from them spoke with them and told them that under the orders of his boss they would no longer be bothering them. This led Señor Rodriguez and the other business owners to conclude that the authorities are involved with organized criminal groups. Although the story of Señor Rodriguez can be seen as a successful exercise of voice, one has to measure the risks associated with this action. If the government is indeed involved with organized crime, an actor cannot always predict how the authorities will react. First, the possibility of retaliation from both the authorities and the criminal organization exists. Second, an actor may not know to what extent the authorities have power over the criminal organizations actions. In some cases, both parties

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5 http://www.vanguardia.com.mx/yoconfioendiosenelgobiernonovictimadeextorsion-1948226.html
6 Cuotas refers to the fees extortion groups charge business owners in order to allow them to run their businesses without being harmed by said extortion group.
risk retaliation from organized crime if they use the option of voice and jeopardize the operations of the criminal organization. It is not the case that organized crime wishes to replace the government or other political institutions in order to assume their responsibilities. Instead, organized crime takes the same economic rational choices as the firms that they impair: they seek to maximize profits and develop their commerce which requires undermining the state.

3.2.3 Loyalty

Loyalty is not as much an immediate alternative as voice and exit are. However, the interaction of loyalty can affect the cost-benefit analysis of whether to use exit or voice. The effect of loyalty is common in cases where there is strong brand loyalty for a consumer or where there is a strong sense of patriotism or political loyalty. Loyalty is carried out when the member or firm stays longer with the expectation that improvement or reform can be achieved. As Hirschman explains, loyalty can be useful in the sense that it prevents “deterioration from becoming cumulative as it so often does when there is no barrier to exit” (1970). When loyalty is exercised, voice is automatically used with greater determination since individuals are locked into their organizations a bit longer. Most importantly, while loyalty postpones exit, its very existence is predicated on the possibility of the member having the ability to exit. This existing threat of the possibility a member might exit gives the firm or member bargaining power with the authority that needs to solve the problem. Hence, in order for voice to function as a recuperation mechanism the threat of exit must always be made clear, whether it is done verbally or it is understood to be an option in the situation by all concerned. When speaking about loyalty in regards to brand loyalty or a nationalistic political perspective, the option of loyalty seems rational. When applied to the situation this study is analyzing however, the costs and risks of loyalty are a lot higher. To reiterate, this study concerns itself with businesses being the
consumer and the state being the management. With this in mind, loyalty comes at a high cost to a business that is rational due to the potential loss of profits they could suffer while staying loyal and attempting to repair their situation through the mechanism of voice.

Out of the three previous options mentioned, exit carries the least risk because they do not have to fear retaliation as much as they would with voice and they would not have to wait for change as they may have to do with the loyalty option. If exit is indeed the best option, the question then becomes where do firms exit to? As mentioned previously in this chapter, one of the reasons exit to a U.S. county is such a beneficial option for Mexicans is simply because of the proximity. For example, if we apply this to a firm experiencing the same dilemma in Mexico City an actor may seek to exit to the nearest safest alternative, not necessarily the United States or they may opt to use the voice option if the location where they can exit does not provide a significantly improved environment. The feasibility of the exit option comes down to the proximity the actor has to a suitable environment. This is where theories of proximity as it relates to economic integration can help explain the reasoning behind the viability of the exit option.

3.3 NEW ECONOMIC GEOGRAPHY

Theories regarding new economic geography will be employed in the attempt to answer this question. Aside from its focus on the importance of location and proximity, new economic geography theory explains economic integration effects in border regions. In the past, economists have ignored spatial particularities in favor of focusing on spatial similarities and commonalities (Leyshon et al, 2011). Economists now however, are attempting to foster more understanding in the field of integration effects on border regions as they have become of increasingly significant interest due to the distinctiveness in economic integration due to their geographic position (Niebuhr and Silvia, 2002). The argument this study seeks to make, speaks to broader new
economic geography (NEG) theories that deal with “the distribution of economic activities across space and explains regional disparities by endogenous location decisions.” The majority of NEG models incorporate a spatial structure, interregional trade costs, and economies of scale in production and monopolistic competition (Niehbur and Stiller, 2002). According to NEG theories, the spatial equilibrium results from the location decisions of firms and workers or consumers which depend on the strength of centripetal or centrifugal forces (Niehbur and Stiller, 2002). Although centrifugal forces usually consist of factors such as high prices and congestion, violence and instability can often also undermine the competitiveness of economic activities, inciting businesses and consumers to seek alternatives elsewhere. The insecurity forces economic activity into spreading out and away from the problem which in this case, causes a natural spillover into U.S. border cities due to their proximity. A significant shortcoming of this theory is that it treats geographical space in an overly simplistic way that does not take into account non-market centrifugal forces such as violence or social instability as mentioned previously. However, because NEG theories do not represent any specific economic landscape and consist of hypothetical worlds built upon assumptions and geographical landscapes (Leyshon et al, 2011), one is able to apply these theories to different border landscapes with unique situations, such as the Mexico-U.S. border.

3.4 Spillovers as a Result of Geographic Proximity

A connection between strong negative influence of regional instability and a decrease in per capita GDP has been discovered by previous studies (Ades and Chua, 1997; De Groot, 2010). Scholars Alberto Ades and Hak B. Chua theorize that regional instability disrupts international trade flows and forces an increase in military expenditures causing a decrease in economic growth to both contiguous border cities. One of the authors of this study, Hak B. Chua, found
that in cross-country settings a country’s growth rate depends not only on domestic investment but also on the investment of its neighboring countries (Ades and Chua, 1997). Although these findings have insinuated negative relationships, this thesis seeks to modify these existing models by showing the ways in which regional instability may cause a positive regional effect on economic performance. Economists familiar with the U.S.-Mexico border region recognize the need for research on the topic of geographical proximity and how it influences economic movement in socially unstable areas. Previous research has found that drug war murders can reduce retail activities in urban economies. This is not only because shoppers are being displaced from crime afflicted districts but also because in areas like the El Paso-Ciudad Juárez border, many shoppers have the ability to opt for safer retail centers in the United States thanks to their geographic proximity (Niño, Coronado, Fullerton, and Walke, 2013). This shows an example of the effects geographic proximity can have on spillovers between contiguous regions.

As demonstrated by research on economic decisions and the spillover effects of close geographical proximity, there is a critical need to address the unique challenges faced by the U.S.-Mexico border region in relation to organized crime violence and its effects on the economy. The amalgamation of these numerous theories will help provide a better understanding of how violence affects economic growth in a region that is not only integrated in its economies, but considered to be interdependent (Martinez, 1994).

3.5 Hypotheses
The theoretical framework discussed will help to answer the following questions this study proposes:

\[ H_1: \text{An increase in violence on the Mexican side of the border will cause an increase in total sales in U.S. border counties.} \]
Total Sales\textsubscript{t} = \alpha + \beta_0 \text{Total Sales}_{t-1} + \beta_1 \text{Violence}_{t} + \beta_4 \text{Unemployment}_{t} + e_t

Where:

- Total Sales\textsubscript{t} is the value of the variable in period \textit{t}
- Total Sales\textsubscript{t-1} is the value of the variable lagged one period
- Violence\textsubscript{t} is the level of violence in period \textit{t}
- Unemployment represents the control variable in period \textit{t}

\textit{H}_2: An increase in violence on the Mexican side of the border will cause an increase in accommodation/food service sales in U.S. border counties.

Accommodation and Food Service Sales\textsubscript{t} = \alpha + \beta_0 \text{Accommodation and Food Service Sales}_{t-1} + \beta_1 \text{Violence}_{t} + \beta_4 \text{Unemployment}_{t} + e_t

Where:

- Accommodation and Food Service Sales\textsubscript{t} is the value of the variable in period \textit{t}
- Accommodation and Food Service Sales\textsubscript{t-1} is the value of the variable lagged one period
- Violence\textsubscript{t} is the level of violence in period \textit{t}
- Unemployment represents the control variable in period \textit{t}

\textit{H}_3: An increase in violence on the Mexican side of the border will cause an increase in retail sales in U.S. border counties.

Retail Sales\textsubscript{t} = \alpha + \beta_0 \text{Retail Sales}_{t-1} + \beta_1 \text{Violence}_{t} + \beta_4 \text{Unemployment}_{t} + e_t

Where:

- Retail Sales\textsubscript{t} is the value of the variable in period \textit{t}
- Retail Sales\textsubscript{t-1} is the value of the variable lagged one period
- Violence\textsubscript{t} is the level of violence in period \textit{t}
- Unemployment represents the control variable in period \textit{t}
H₄: An increase in violence on the Mexican side of the border will cause an increase in the amount of establishments in U.S. border counties.

- Establishmentsₜ = α + β₀Establishmentsₜ₋₁ + β₁Violenceₜ + β₄Unemploymentₜ + εₜ
- Establishmentsₜ is the value of the variable in period t
- Establishmentsₜ₋₁ is the value of the variable lagged one period
- Violenceₜ is the level of violence in period t
- Unemployment represents the control variable in period t

In hypotheses one through four, I will substitute Violenceₜ in each equation with Homicideₜ, Kidnappingsₜ, and Extortionsₜ.

Where:

- Homicideₜ is the level of murders in period t
- Kidnappingsₜ is the level of kidnappings in period t
- Extortionsₜ is the level of extortions in period t
Research Design

This study will employ a cross-sectional time-series model with lagged dependent variables to test the hypothesis. The dependent variables have been lagged to reduce autocorrelation. This study will be focus on the years 2005-2011, to test the effects that violence has on the economic growth of a country’s directly contiguous counterparts. The unit of analysis is dyads of borderland counties in Texas and California bordering Mexico. This study provides three basic models in order to analyze the previously stated hypothesis between conflict and economic growth. In table 5.1, total sales are regressed on homicides, kidnappings, and extortions. In table 5.2, accommodation and food service sales are regressed on homicides, kidnappings, and extortions. Next, table 5.3 demonstrates retail sales regressed on homicides, kidnappings, and extortions. Lastly, table 5.4 demonstrates the number of total establishments regressed on homicides, kidnappings, and extortions. The variables and their descriptions can be observed in Table 4.1.

Table 4.1: Variables

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Definition</th>
<th>Units of Measure</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug-related homicide</td>
<td>Deaths resulting from armed clashes or ‘execution-style’ killings by or against members of an organized criminal network</td>
<td>Deaths (per 100,000 inhabitants)</td>
<td>Presidencia de la Republica</td>
</tr>
</tbody>
</table>

7 Tijuana, Mexicali, Ciudad Juárez, Nuevo Laredo, Reynosa, and Matamoros were chose because they all have populations above 250,000 and constitute 79 percent of the population of Mexico’s northern border municipalities. Also one quarter of the drug-related homicides committed in Mexico between the years 2007 and 2010 occurred in these cities (Fullerton and Walke, 2013).
<table>
<thead>
<tr>
<th>Kidnapping</th>
<th>Depriving an individual of their liberty with the intention of obtaining ransom money or other benefit at the cost of the person being held or a third party</th>
<th>Reported Kidnapping Victims (per 100,000 inhabitants)</th>
<th>Secretariado Ejecutivo del Sistema Nacional de Seguridad Publica (Executive Secretariat of the National Public Security System)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extortion</td>
<td>The act of forcing an individual to do, stop doing, or tolerate something with the goal of obtaining a profit for themselves or others through the means of physical or psychological violence</td>
<td>Reported Extortion Victims (per 100,000 inhabitants)</td>
<td>Secretariado Ejecutivo del Sistema Nacional de Seguridad Publica (Executive Secretariat of the National Public Security System)</td>
</tr>
</tbody>
</table>

**Dependent Variables**

<table>
<thead>
<tr>
<th>Total Sales (all industries)</th>
<th>Total value of sales for all industries Dollars scaled into millions</th>
<th>Texas Comptroller of Public Accounts, California State Board of Equalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodation/Food Service Sales</td>
<td>An index of transactions subject to sales and use tax Dollars scaled into millions</td>
<td>Texas Comptroller of Public Accounts</td>
</tr>
<tr>
<td>Retail Sales</td>
<td>Total value of sales for retail sector Dollars scaled into millions</td>
<td>Texas Comptroller of Public Accounts, California State Board of Equalization</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Establishments</th>
<th>Total number of establishments for all sectors Establishments</th>
<th>U.S. Census County Business Patterns</th>
</tr>
</thead>
</table>
### 4.1 **INDEPENDENT VARIABLES**

Homicide is one of the most frequently referenced measures of violence around the world. Compared with other violent crimes, like the ones that will be used in this study such as kidnapping and extortions, homicide has a relatively high rate of reporting, in part because it is more difficult to hide than other stated crimes. The homicide rates were obtained from the Secretary of the Interior (Secretaría de Gobernación) since they count the number of homicides related to activities of criminal organization and not only homicides in general. To replace homicide numbers that may be missing from the SEGOB reports, I will substitute with the homicide rates from Mexico’s National Statistics Institute (INEGI). The numeric figures for all variables measuring violence are scaled to represent rates per 100,000 inhabitants.

Besides homicides, kidnapping and extortion come in next as a grave threat to citizen security. As UNAM professor Octavio Rodríguez Araujo stated in March 2014, “The more [the government] breaks up organized armed groups, the more others proliferate, seemingly without organization or control, choosing the easiest option: kidnapping or robbing anyone who happens to be passing or who isn’t paying attention, and using this as a way to make money.”⁸ Therefore, this study theorizes that an increase in these crimes also has an effect on the economy of the

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border. There is a significant weakness that should be addressed regarding these statistics. It is believed that extortions and kidnappings are widely underreported due to the fact that victims are reserved about sharing the amount they were asked to pay for fear of being further targeted. An overall sense of fear and skepticism causes these crimes to go widely underreported. Therefore, the data used in this study are not a completely accurate portrayal of the current situation in Mexico in regards to these crimes. The data for the remaining independent variables of kidnappings and extortions were obtained from Mexico’s Secretariado Ejecutivo del Sistema Nacional de Seguridad Publica (Executive Secretariat of the National Public Security System). This entity unfortunately, does not provide its data by county, unlike the Secretaria de Gobernacion. Therefore, the extortion and kidnapping data include the incidents that happened in the entire border state, not just the contiguous border cities.

### 4.2 Dependent Variables

The following variables will be employed in this study as proxies for economic growth: total sales, accommodation and food service sales, and total establishments in U.S. counties. The data for total sales in the state of Texas was obtained from the Texas Comptroller of Public Accounts who reports the gross sales of all industries. For the state of California, the total sales were obtained from the California State Board of Equalization who only reports taxable sales as opposed to gross. For the accommodation and food service sales the data was only available for the state of Texas. The Texas Comptroller of Public Accounts provides gross sales for this specific variable. The variable has also been scaled into millions of U.S. dollars. The state of California however, only provides the taxable sales numbers for specific industries and accommodation and food services is not one of them. The data on retail sales was also obtained for Texas through the Texas Comptroller of Public Accounts. The data provided are gross figures
and are also scaled into millions of U.S. dollars. The retail taxable sales for California were obtained through the California State Board of Equalization. Lastly, the data on U.S. establishment’s data was acquired through the U.S. Census Bureau County Business Patterns. A significant weakness this data has is that it does not specify whether the new business being established belongs to an immigrant (Olimpia Arceo-Gomez, 2013). All the dependent variables have been lagged and scaled into millions of U.S. dollars.

4.3 Control Variable

This study is controlling for unemployment rates to account for the recession the U.S. suffered since the year 2008. The unemployment rates were compiled with data from the U.S. Bureau of Labor Statistics and from the State of California Employment Development Program.

Table 4.2. Summary statistic of dependent, independent, and control variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homicides</td>
<td>24.08313</td>
<td>49.25976</td>
<td>0</td>
<td>205.5353</td>
</tr>
<tr>
<td>Kidnappings</td>
<td>1.695952</td>
<td>1.487465</td>
<td>0.15</td>
<td>6.69</td>
</tr>
<tr>
<td>Extortions</td>
<td>5.888333</td>
<td>4.606816</td>
<td>0.46</td>
<td>15.69</td>
</tr>
<tr>
<td>Total Sales</td>
<td>8088.898</td>
<td>7958.706</td>
<td>1.77393</td>
<td>23385.61</td>
</tr>
<tr>
<td>Accommodation and Food Service Sales</td>
<td>611.4269</td>
<td>278.8019</td>
<td>270.3448</td>
<td>1145.559</td>
</tr>
<tr>
<td>Retail Sales</td>
<td>3741.597</td>
<td>3323.008</td>
<td>1.216423</td>
<td>8974.654</td>
</tr>
<tr>
<td>Total Establishments</td>
<td>19064.9</td>
<td>26551.9</td>
<td>2350</td>
<td>79188</td>
</tr>
<tr>
<td>Unemployment</td>
<td>10.36667</td>
<td>6.504283</td>
<td>4</td>
<td>29.9</td>
</tr>
</tbody>
</table>
Empirical Results

Table 5.1. Regression Results with AR (1) disturbances of Total Sales, Homicides, Kidnapping, Extortion and Unemployment rates

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homicides</td>
<td>5.955975</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(14.625)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kidnapping</td>
<td></td>
<td>26.10666</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(139.8191)</td>
<td></td>
</tr>
<tr>
<td>Extortion</td>
<td></td>
<td></td>
<td>-15.52939</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(86.91967)</td>
</tr>
<tr>
<td>Unemployment</td>
<td>-33.61087</td>
<td>0.5283</td>
<td>24.34656</td>
</tr>
<tr>
<td></td>
<td>(151.759)</td>
<td>(0.0131)</td>
<td>(71.68519)</td>
</tr>
<tr>
<td>Number of obs</td>
<td>30</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>R-sq overall</td>
<td>0.5597</td>
<td>0.5342</td>
<td>0.5307</td>
</tr>
<tr>
<td>Prob &gt; chi2</td>
<td>0.0001</td>
<td>0.0131</td>
<td>0.0065</td>
</tr>
</tbody>
</table>

Significant p values in bold P < 0.05 *, P < 0.01 **, P < 0.001***

The impact homicides, kidnappings, and extortions had on total sales were not statistically significant as indicated in table 5.1. The control variable of unemployment was also not statistically significant. A possible explanation is that fear of falling casualty to the violence is not enough of an incentive to drive businesses and consumers to other cities. Because drug-related homicides are commonly targeted at cartel rivals or anyone who wrongs the cartel, homicide can be possibly only a direct threat to those individuals. Businesses or consumers who fall victim to drug-related homicides may do so just by simply being at the wrong place at the wrong time. It may also be the case the extortion and kidnapping do not provide enough of an incentive for individuals to not only permanently exit their current locations, but to consume products and services on the adjoining side of the border.
The effect of homicides on accommodation and food service sales resulted in a statistically significant positive relationship as indicated in Table 5.2. This finding possibly suggests that individuals were not fleeing their cities permanently, but instead may have possibly just have been visiting the adjoining border city as a temporary escape. This could imply that not all individuals had the capability to exit, but many had the appropriate visas to come temporarily and make use of accommodation and food service locales such as hotels, restaurants, and bars. One can also conclude this given how many businesses dedicated to non-essential services and products, such as nightlife, closed due to the state of insecurity homicides caused. Following that logic, one would assume that kidnappings and extortion would also be significant given that if businesses had to close due to these crimes, consumers would be left with the option to seek products and services elsewhere. The findings however, do not reflect this.
As seen in Table 5.2 and 5.3, both extortion and kidnapping were not statistically significant when regressed with accommodation and food service sales and retail sales. This could be because there is simply not a significant enough effect for the models to capture or it could be due to low number of observations the model has. The lack of degrees of freedom can possibly help explain the statistically nonsignificant results found for all the variables in Table 5.3. As this thesis mentioned before, it has been found in previous studies that violence stifles retail activity domestically therefore; this lack of customers in addition to extortion threat can become too much for smaller businesses. With businesses closing, the options consumers have narrows down significantly causing consumers to look for products and services elsewhere. Therefore, one would expect the findings to reflect this in the retail sales model. By increasing the degrees of freedom in future research, the results may possibly change.

Table 5.3. Regression Results with AR(1) disturbances of Retail Sales, Homicides, Kidnapping, Extortion, and Unemployment rates

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homicides</td>
<td>-0.4533533</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>3.129424</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Kidnapping</td>
<td>--------------</td>
<td>32.37167</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>--------------</td>
<td>48.74604</td>
<td>--------------</td>
</tr>
<tr>
<td>Extortion</td>
<td>--------------</td>
<td>--------------</td>
<td>2.757573</td>
</tr>
<tr>
<td></td>
<td>--------------</td>
<td>--------------</td>
<td>28.48387</td>
</tr>
<tr>
<td>Unemployment</td>
<td>-3.085575</td>
<td>7.092789</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>35.66034</td>
<td>26.38415</td>
<td>--------------</td>
</tr>
<tr>
<td>Number of obs</td>
<td>20</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>R-sq overall</td>
<td>0.6443</td>
<td>0.6483</td>
<td>0.6458</td>
</tr>
<tr>
<td>Prob &gt; chi2</td>
<td>0</td>
<td>0.015</td>
<td>0.015</td>
</tr>
</tbody>
</table>

Significant p values in bold P < 0.05 *, P < 0.01 **, P < 0.001***
Table 5.4. Regression Results with AR(1) disturbances of Total Establishments, Homicides, Kidnapping, Extortion, and Unemployment rates

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homicides</td>
<td>24.65632</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>29.20938</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Kidnapping</td>
<td>--------------</td>
<td>366.5237</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>--------------</td>
<td>453.9139</td>
<td>--------------</td>
</tr>
<tr>
<td>Extortion</td>
<td>--------------</td>
<td>--------------</td>
<td>190.616</td>
</tr>
<tr>
<td></td>
<td>--------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Unemployment</td>
<td>-781.7683</td>
<td>-680.6187</td>
<td>-663.3913</td>
</tr>
<tr>
<td></td>
<td>331.0009</td>
<td>264.6517</td>
<td>265.0216</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of obs</td>
<td>30</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>R-sq overall</td>
<td>0.5449</td>
<td>0.5062</td>
<td>0.5023</td>
</tr>
<tr>
<td>Prob &gt; chi2</td>
<td>0.0005</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Significant p values in bold P < 0.05 *, P < 0.01 **, P < 0.001 ***

Like the other models, Table 5.4 suggests all the independent variables resulted in not being statistically significant when it came to the number of establishments that exist in the cross border counties. These results possibly refute the hypothesis that conflict mobilized business owners to flee their respective domains for safer locations. This could be due to the lack of resources business owners may have experienced. The costs of relocating and entire business, let alone into another country may have been too costly for certain business owners who may have been force to close down. The variable used may account for the results. As opposed to using the number of new immigrant owned businesses, the total establishments variable simply describes the number of establishments existing a specific year. A weakness in this variable that may account for its insignificance is that the variable does not account for alternative sectors of the economy such as informal employment. For future research, it may be worthy to add case

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9 Originally, two separate models were conducted separately for the state of California and Texas resulting in the independent variable of homicides being statistically significant and indicating a positive relationship.
10 Informal economy is the unreported exchange of legal goods and services.
studies that can encompass and account for informal employment as well as the monetary worth of immigrant owned businesses in the border to account for owners’ ability to relocate. This is important to mention because many individuals who closed businesses due to their incapacity or unwillingness to pay for extortion fees, may have left to their contiguous border cities but not necessarily opened businesses through legal means. These individuals may have had the resources to obtain a visa to visit the U.S. and find gains through the informal economy but not enough resources for an E1 or E2 investment visa.
Conclusion

The study set out to explain the effects of conflict on economic growth along the U.S.-Mexico border. The study has also sought to know what specific sectors of the economy benefited, if any, from the economic spillover created by the violence. The existing literature on the subject matter is inconclusive on several vital questions this thesis seeks to explain. The study sought to answer the following question: Will an increase in violence on the Mexican side of the border cause an increase in the economic growth of U.S. border counties?

The empirical results suggested that the only act of violence that had a positive effect on the economic growth of U.S. border counties is homicide when it comes to the industry of accommodation and food services. The rest of the results however, indicate that kidnapping and extortions did not have a significant effect on the economic growth of counties analyzed. This is not to say that there is indeed no effect, but instead the models do not capture it. It is a possibility that with a larger sample with an increase in the number of observations the models could demonstrate something different. 11

5.1 Theoretical Implications

The findings of this study cast a doubt on the theoretical assumptions regarding conflict and economic growth and therefore need to be revisited in order to further understand the dynamics of spillovers in contiguous borders. As mentioned in the literature review section, many studies have found a negative relationship between conflict and economic growth in borders. It is, however, noted from this study that such a negative relationship is not always the case and the direction of the relationship is contingent upon the type of conflict or violence and

11 Data available upon request. I may be reached at ktrevino7@gmail.com.
the border where it occurs. These results also suggest a possible inconsistency with what Hirschman’s “Exit, Voice, Loyalty” theory expects. The narrative by the media suggesting a mass exodus speaks to an abandonment of homes in the Mexican side of the border. These findings however, suggest that if there was an exit it was not to the immediate northern part of the border. This exodus could have occurred further north into other U.S. cities or, more logically, south to other Mexican cities. The findings also cast some doubt and contradict some of the patterns presented by new economic geography theories that state centrifugal forces such as violence and instability can undermine the competitiveness of economic activities to the point of inciting businesses and consumers to seek alternatives elsewhere. Homicides demonstrated to be consistent with the findings of new economic geography theories with the food and accommodation services industry however, kidnappings and extortions proved to not undermine the economy to the point where businesses found themselves leaving because of that cause.

5.2 Policy Implications
The number of investment visas given to Mexicans during the peak of the drug war rose sharply. From 2006 to 2010, a total of 10,512 E-1 and E-2 investment visas were granted, a 73 percent increase over the previous five-year period (Sheridan, 2011). This increase in investment visas cannot be ignored when hypothesizing that the violence in the Mexican border region is causing a positive economic spillover as opposed to a deleterious one in the neighboring cities. In the city of El Paso, businessmen and women have gone as far as creating a club named “La Red” to provide fellow new-comers with advice on how to relocate their businesses to the U.S. (Rios, 2011). This supposed exodus of investment abandoning Mexican border cities for U.S. counterparts depletes the city suffering the violence even further, increasing and sustaining the instability, providing policy makers with a tentative time frame for the positive spillover.
However, if this is a reverse cycle and once the economic outlet to return to Mexico opens up once again, policy makers should consider a possible reverse migration of investment that could decrease their own growth. Therefore, the findings of previous studies should encourage current policy makers in the investment receiving city to encourage and promote the current incoming investment and growth to prevent a reverse flight of investment.

5.3 Future Research and Limitations

To generate better practices in implementing policy strategies to deal with this unprecedented economic growth found in this study, there is a need for more qualitative research because regardless of the similarities the border counties in the study share, they all hold unique characteristics. Also, adding more case studies may supplement and improve on the limitations that the specific data this study worked with was not accurate and readily available. Another important avenue for future research aspirations include investigating if the effect of violence is circular as mentioned previously. In other words, will the decrease of violence in Mexico border cities also cause a decrease in economic growth in the U.S. border cities?

As mentioned previously, one of the largest limitations of this study was the data collection. The data used were obtained from government agencies that likely suffer from underreporting as far as the crimes this study used. Also, several media outlets report that the data provided by the government can often be false since the data of homicides, kidnappings, and extortions reported by media outlets tend to be significantly higher than that of the government. Also, the availability of the data proved to be a limitation as it may also do for future research because under President Peña Nieto, Mexico has stopped producing organized-crime related homicide data. Another possible alternative to the data problem encountered in the study could be improved by adding additional degrees of freedom through quarterly data as opposed to
yearly data. Despite these data challenges, this study has offered a quantitative perspective on an important economic and social issue affecting both the United States and Mexican borders.
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Vita

A native of Anthony, New Mexico, Karen Elizabeth Treviño graduated Gadsden High School in 2007. During her undergraduate education, Karen was involved in a number of extracurricular activities. She was captain of her university’s volleyball team, Global Affairs and Diplomacy Student Association President, Political Science Student Association and Undergraduate Student Government Treasurer. After earning a B.A. in Political Science from the University of the District of Columbia in May 2011, Karen enrolled in the graduate program in Political Science that following spring.

During her tenure as a graduate student, Karen has worked as a teaching assistant for several instructors. In addition, Karen served as a research assistant to Dr. Gaspare Genna. Moreover, she presented at two conference presentations during the Spring 2014 semester. During her last semester, Karen also served as a panelist in the Large Class Seminar Series being held at UTEP. Karen received the Thomas Cook Award for the Outstanding Graduate Student in Political Science and the Outstanding Graduate Student Award in Political Science for spring 2014.

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