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Geopolitics



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# The Unexpected Effects of Criminal Violence along the Mexico–Texas Border<sup>1</sup>

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#### ABSTRACT

The violence and insecurity that Mexico suffered during former President Calderon's war on the Mexican drug cartels have come at a grave economic cost to many cities. The criminal violence had an impact on interdependent borderlands, which are geographic areas that have a symbiotic link between cities and communities of adjoining territories. Mexican business people and consumers that live in cities along the shared border with the United States have the ability to shift their economic transactions away from their insecure environments and to US border communities. In addition, US residents that would normally travel south for economic transactions would decide to avoid violent areas and therefore conduct business on the northern side. This research demonstrates that increased violence in Mexico produced a positive economic effect on the US side of the Mexico-Texas interdependent borderlands. Specifically, our time series analysis (2002-2014) shows that increased homicides, kidnappings and extortions in adjacent Mexican cities are strongly associated with higher gross total sales in the Texas communities while controlling for economic and demographic factors. We also found that the increases in the three crime categories were not associated with the arts, entertainment and recreation sector, nor the accommodation and food services sector performance. However, there was a positive relationship with the retail sales sector.

Between 2006 and 2012, Mexico experienced an extreme surge in violence. Much public life moved indoors with many individuals refraining from normal daily activities in fear of becoming a casualty. The violence was especially hard on the social and economic lives of those in cities along the border with the US. The volume of research regarding the origins and implications of the cartel violence is growing, and evidence indicates a negative relationship between the violence and domestic economic activity. However, little scholarly work focuses on the effects that the increased violence has had on US counties along the border, especially those in Texas.<sup>2</sup> Instead, the public was told by many media pundits and politicians

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that the surge in violence would spill over into Texas counties.<sup>3</sup> Of course, none of these warnings came to fruition.<sup>4</sup>

Citizens of, and visitors to, Mexican border cities initially dismissed news regarding the violence, believing that it impacted only those involved in criminal activities. Attitudes quickly changed after 2008 when the increasingly gruesome violence affected individuals from all walks of life. For example, in Ciudad Juárez, Chihuahua, Mexico, around 1,623 people were murdered in 2008 alone.<sup>5</sup> This increase sent a wave of fear into the citizens of Juárez and the surrounding areas. During this time of uncertainty, a great many feared becoming a casualty of the violence. In addition to the growing rate of homicides, other crimes such as extortion and kidnapping increased.

At the very least, we were told that the economies of US cities along the border would be harmed. However, given the high level of social and economic integration on both sides of the Mexico–Texas border, we argue that the economic effect on Texas counties has been generally positive. It has been estimated that in the past, Mexican visitors' expenditures along the Mexico–Texas border generate over three billion dollars in output, helping support more than 150,000 jobs.<sup>6</sup> Industries such as automobile dealerships, gas stations, restaurants, and general stores have consistently had high profits due to border commerce.<sup>7</sup> However, increased drug war murders have been found to reduce retail activities domestically.<sup>8</sup>

Many Mexican businesses were forced to close down due to very high extortion fees. This is understandable, from a rational standpoint, since the violent environment prevented these businesses from being profitable. However, individual consumers still needed to purchase goods and services. The economic interdependence of the border provides a unique landscape for those fleeing the violence to enter safer areas in the US side to conduct economic transactions. This study seeks to investigate the effect on the economies of the Texas border counties, which we will demonstrate were generally positive due to their proximity to the violence. This article, however, does not seek to explain the reasons behind the violence, as there are many theories;<sup>9</sup> instead it recognises the increase in violence and looks to investigate the subsequent economic effects.

Our argument rests on the following logic. The presence of stronger institutions on the US side prevented the violence to spillover<sup>10</sup> and thereby provided safer conditions for consumers. Mexican consumers with the ability to access to US markets would exit from the areas with increased violence to conduct economic activity in Texas. Texas consumers that would normally purchase goods and services in Mexican border cities due to lower prices also exited those markets and switched to local markets. The resulting environmental conditions improved the economic performance of Texas counties.

We focus on the Mexico-Texas border, rather than the entire Mexico-US border, because of special characteristics of this segment. First, of the 1,989

miles of border, 1,254 miles or 63% is with Texas. Shared characteristics (such as language and history) lower transaction costs necessary for economic activities to occur.<sup>11</sup> It is also an understudied portion compared to the western portion due to the special attention given to the Tijuana, Mexico–San Diego, US region.<sup>12</sup> Finally, this segment is rich in diverse economic activity. At the western, end is Paso del Norte, which is heavy in industrial manufacturing. As we travel east, we see a greater reliance on agriculture, transportation and services. This diversity of activity is helpful because our results will not be biased towards either end of the production spectrum.

The article begins with a review on the effects of criminal instability on economic growth, particularly how it impacts local and neighbouring economies. Next, we discuss our conceptual framework followed by a discussion of our methodological approach and empirical results. We conclude by pointing out further avenues of research.

#### The Impact Criminal Violence has on Economies

Organised crime discourages domestic and foreign direct investments, reducing the competitiveness of firms and most importantly, by reallocating resources, creating uncertainty and inefficiency in the economy.<sup>13</sup> Organised crime also has the influence on the economy because it is not confined solely to illegal or underground markets. It interacts with the private and public sectors of the legal economy, such as using sectors to launder ill-gotten gain.<sup>14</sup>

Weak or absent institutions further increase economic uncertainty already caused by organised crime. Weak institutions allow organised crime to replace the state in the protection of property rights which is usually done through one of its main revenue-making elements: extortion.<sup>15</sup> Another major way in which organised crime infiltrates the legal economy with weak institutions is through the bribing of public officials. Although it may seem that the corruption of public officials does not directly affect the legal sector's income, there are positive correlations between corruption, crime and public expenditures in the case of Italy.<sup>16</sup> In the case of Mexico, public officials being bribed can often be police officers, allowing organised crime to expand their illicit activities.

Researchers also conclude that regional instability in neighbouring countries has an adverse effect on a country's economic performance, just as if the instability was happening domestically.<sup>17</sup> The argument has an intuitive appeal: Crime would diffuse across space unless its source is extinguished. However, it may be the case that these models are applying a "one size fits all" approach by not considering the characteristics of specific regions like interdependent borderlands. The Mexico–Texas border can be described as an interdependent borderland, which is an area where "a border region in one nation is symbiotically linked with the border region of an adjoining country".<sup>18</sup> Regardless of the inequality between these interdependent economies, "the productive capacity of the wealthier country is often matched with raw materials and cheap labour in the poorer nation" and yields proportional benefits to each side.<sup>19</sup>

Geographical proximity and productivity differences of the Mexico–Texas border economies evolved complementary industrial linkages, which further intensified since the North American Free Trade Agreement.<sup>20</sup> The spatial geography of borders, specifically their proximity, can lead to larger flows of people, goods and investment concentrated in borderlands. We also see evidence of one side strengthening the economic conditions of the other, particularly labour markets.<sup>21</sup> 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<sup>22</sup> and transnational processes. The former takes place on a regional scale where economic practices are contingent on the spatial contiguity of both countries and allows the intensifying of the economic nexus between border cities.<sup>23</sup> Such processes include the maquiladora industry, transmigration<sup>24</sup> and retail commerce. The existence of transnational processes, 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 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 Mexico-Texas border, where large numbers of individuals cross every day. Those who cross back and forth daily have 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.<sup>25</sup> It is important to note that border cities are not the only cities to have experienced an economic impact due to the drug violence. San Antonio, although approximately 156 miles from the Mexico-US border, benefited specifically from affluent Mexicans fleeing despite the city not being located near the border. For instance, it is reported that private jet flights between San Antonio and Mexico nearly doubled between 2008 and 2010, reaching 3,997 in 2010, according to city officials.<sup>26</sup> In another instance, the city's Mexican Entrepreneurs Association, founded 15 years ago, grew from a handful of members to 200 members.<sup>27</sup> Other Texas cities, such as Austin, Dallas-Fort Worth and Houston also reported high levels of Mexican direct business investment due to the drug violence even though these cities are not located on, or even close to, the Mexico-US border.<sup>28</sup> The impact of these cities will not be quantified for this study since our focus is counties in the border, but it is a worthy impact to analyse in future research.

If the Mexico–Texas border economic processes are more of a crossborder than transnational, then we should see greater fluidity of activities including the diffusion of violence and economic decline. However, anecdotal evidence demonstrates that economic activity remained fluid, and perhaps accelerated, without the negative spillover of violence. The transfer of Mexican business operations is not extremely difficult because their products are already targeting American consumers.<sup>29</sup> Olimpia Arceo-Gomez demonstrates that college-educated immigrants are fleeing the country and leaving Mexico depleted of both human and physical capital.<sup>30</sup> Her study also shows 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.<sup>31</sup> A one per cent point increase in the weighted homicide rates is correlated with a 0.57 per cent point increase in Mexican immigrants into the United States.<sup>32</sup> It has also been estimated that 700 businesses closed in Nuevo Laredo alone in the year 2006.<sup>33</sup>

Perhaps one of the most important and interesting findings is that one per cent of the weighted homicide rate in Mexico produces an increase in 2.03 per cent of the immigration of college-educated Mexicans in the border states.<sup>34</sup> This indicates that wealthier than average immigrants are fleeing the violence in Mexico and may help increase a US border county's economic growth. However, studies thus far have not explained or demonstrated if the US border areas would see aggregate economic benefit from increased violence on the Mexican side.

#### **Theorising Economic Effects from Violence**

Before we begin exploring the possible effects of the violence on the economy, it is important to recognise that there are several hypotheses that can explain the increased violence. Although there is not a one-size-fits-all explanation, all arguments have one underlying factor in common: All the cities that experienced a significant increase in violence had military operations and/or federal police presence.<sup>35</sup> The presence of these two government entities is not only associated with an increase in violence, they are also responsible for political instability in both state and municipal governments as well as the leadership in criminal organisations.<sup>36</sup> The problems and motivations in organised crime organisations have consistently remained the same over time, fighting for new markets to expand profit. If the organised crime motivations have remained the same, why the visible increase in violence? Criminal organisations were able to sustain a model of expansion with minimal violence due to the municipal police involvement in organising and maintaining order in both informal and illegal markets.<sup>37</sup> Therefore, bringing in an outside force, unaware of local agreements, to impose the rule of law on these informal and illegal organisations, caused uncertainty with said groups and thereby generating the violence.<sup>38</sup> Other explanations suggest that the expansion of the drug market after the consolidation of the cocaine market and the production of heroin and cannabis in Mexico caused a complexity in the market that disturbed the status quo in criminal organisations.<sup>39</sup> As the drug market and profits expand, the interdependence between actors involved increases. This forces organised groups to create more pacts and agreements with law enforcement, new criminal groups and any other actor with vested interests in the market.<sup>40</sup> Failure to fulfil such agreements can potentially create greater instability and violence among the aforementioned groups.

We begin by examining how 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. Although US border cities with large retail sectors tend to be more integrated with the Mexican economy and while Mexican cities with large maquiladora sectors are more integrated to the US economy, changes in one economy will affect the other.<sup>41</sup> It is therefore understandable why individuals would believe that increases in violence on the Mexican side would have harmful economic effects on the Texas side. Our alternative view posits that individuals seek out economic transactions in neighbouring Texas counties because geographic proximity and cross-border fluidity provided access to safer commercial areas, contributing to a positive economic spillover.

Our argument assumes individual rational behaviour. Individuals desire to obtain a maximum of utility or satisfaction.<sup>42</sup> The ways in which actors choose to reach the optimum positions depend on the knowledge, and understanding the actors have regarding the options open to them.<sup>43</sup> If the economy of a city is deteriorating and hampering the maximisation of utility and satisfaction due to reasons outside of the control of firms and consumers, actors will seek to maximise utilities by exiting and conduct transactions in a less violent environment.

Individuals also have the options to voice their concerns or wait it out, in addition to exiting.<sup>44</sup> Each option carries a cost, so individuals will seek out the least costly one in order to maximise their utility. When customers choose to voice their concerns instead of exiting, they express their dissatisfaction (i.e. general protest) when they believe that voice can resolve the problem that is reducing their utility. Waiting out, or what Hirschman refers to as loyalty, occurs when the problem does not reduce the utility significantly.<sup>45</sup> In other words, the good still greatly outweighs the bad. In the case of the northern Mexican region, the high level of violence makes voice a poor option, at least in the short term. Waiting it out is also a poor option given the high stakes posed by the violence.

The availability of the exit option is contingent upon having normal or non-perfect competition.<sup>46</sup> If there is readily available competition, then exit

is the utility maximising option. In simpler terms, consumers and producers can only exit if there is the ability to do so. Without the ability to exit to something or somewhere else, individuals will be stuck in the suboptimal environment. Ability to exit, however, rests on three elements: proximity, quality and legality.

Exiting becomes viable when consumers and producers are geographically close to alternatives. According to new economic geography school of thought, a spatial equilibrium results from the location decisions of individuals which depend on the strength of centrifugal forces.<sup>47</sup> Although centrifugal forces usually consist of factors such as high prices and congestion, violence can also undermine the competitiveness of economic activities, inciting businesses and consumers to seek alternatives elsewhere that are geographically close. The further away the alternative, the less likely individuals will take the exit option.

Cities on both sides of the Mexico-Texas border are very close, and in a few cases, they are adjacent. Along the 1,254 mile Texas stretch of the border with Mexico, cities are connected by 28 international bridges. We should also note that although the binational metropolitan statistical areas are adjacent, some border cities have more crossings than others. This could potentially affect the economic growth the US side of the border experiences by providing more outlets and opportunities for economic activity. For instance, the cities of Brownsville, Texas and Laredo, Texas each have three bridges along with one railroad crossing. The El Paso border possesses four bridges and two railroad crossings making it one of the most important and active borders. The border with the least adjacent border crossings is McAllen, Texas. McAllen has only two bridges in the actual city. Other border crossings are located in the surrounding areas in Hidalgo County, the county where McAllen is located, but they are not considered part McAllen's city limits. Proximity and adjacency are imperative to making the exit option viable, if the individual has the capacity and resources to utilise this option.

The alternative option must also have similar or higher quality markets for individuals to exit. The quality of an alternative is a difficult concept to quantify and define because of its subjective nature. For our purposes, we will focus on the alternatives' ease of use. The basic question that an individual can ask is, how difficult would the new market, services and products be for me to use? Requiring an individual to incur extra cost due to difficulty of use may dissuade individuals to exit. For our study, this element is also present because counties on either side have cultural and social affinities as well as shared historical experiences.<sup>48</sup> In El Paso, Texas, the US 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 people and consumers to enter a location where they can conduct business in their native language makes the option of exit that much more enticing.

Consumers can conduct business in Spanish in every venue since most employees have at least business level fluency. This is the case at every level: from small establishments to large chain stores.

The last element is legality. Individuals will be dissuaded to exit if they have legal hurdles to overcome or if the act of exit in and of itself is illegal. Overcoming a legal hurdle will require heavy costs because individuals will need to hire professional services to be able to traverse barriers. If the act is clearly illegal, then individuals can incur sanctions such as fines or incarceration. The costs, of course, would be nil, if the alternative has no legal registrations. The issue of legality also extends to the sphere of labour and generating income outside the law and regulation.

This is highly important for our study since producers and consumers on the Mexican side will need to enter the United States at Texas crossings in order to conduct business. Although the difficulty of crossing should not be understated, we see evidence that individuals are able to overcome legal barriers. For example, college-educated individuals did leave the violence in Mexico and immigrated to the United States.<sup>49</sup> This type of migration has a direct negative effect on the economic decisions and development of the Mexican border region while being advantageous to the US side.<sup>50</sup> We also see local Mexican investors uproot and replant themselves along the border with Texas.<sup>51</sup> For those unable to move to the United States, there is the option to temporarily enter. Mexicans with a Border Crossing Card can cross and travel up to 25 miles into the United States without an I-94, giving individuals the ability to purchase goods in the neighbouring county.<sup>52</sup> As a result, individuals remain concentrated in the border zone leaving the second border checkpoints seventy miles away less impacted by the exit option.<sup>53</sup> The United States also experienced an unprecedented increase in asylum seeker requests due to the violence.<sup>54</sup> In order to qualify for asylum, petitioners must provide an argument that they are fleeing persecution. It is customary for US courts to hold that mere harassment or discrimination and generalised conditions of violence do not constitute persecution.<sup>55</sup> Although not clearly specified by the UN's Refugee Agency, persecution regularly constitutes a threat to the life or freedom of an individual. Therefore, individuals seeking refuge due to lacking the ability to migrate are not just facing intimidation, but serious threats to their life. It has also been previously found that an increase in homicides in border Mexican counties leads to an increase in migration to American border cities.<sup>56</sup>

So far we theoretically explained why Mexican residents will rationally exit their domestic markets when their safety is jeopardised due to extreme violence; they have the ability to exit due to proximity, quality and legality. By exiting domestic markets, they improve the economies of the entering market, namely the Texas border counties. It is also important to note that the logic that push Mexican producers and consumers out of their domestic markets keeps US producers and consumers in US markets. The trade-off in going into Mexico for goods and services for US citizens is due to lower prices. However, the violence introduced a higher premium that would lead them to conduct business in their domestic economy. Our theory, therefore, gives us our first testable hypothesis:

*H*<sub>1</sub>: An increase in violence on the Mexican side of the border will be associated with an increase in total economic activity, measured through gross sales, retail sales, arts, entertainment and recreation sales, and accommodation and food service sales, in the Texas border counties.

So far, we treat cartel violence as a monolithic phenomenon. However, it is in fact multifaceted. The violence comprised homicides, extortions and kidnappings. Each component, theoretically, would vary in its degree of impact on economic performance due to how they target the victims and spread fear. The type of violence that spreads the most fear and is least targeted would have the largest impact on the Texas counties' economics.

Homicides, while having a very specific target or targets, will also have the largest scope of violence because non-targeted individuals can also fall victim. Homicides due to drug cartel activities target their enemies: rival cartel members, journalists, law enforcement officers and others that do not follow their wishes. These murders are often not clean hits because they take place in public places with many bystanders, who also fall victim. The fact that random individuals are also murdered spreads fear and the desire to exit from public commercial spaces. As the homicide count increases in the news, individuals would modify their activities in order to remove themselves from harm's way. This would lead Mexican citizens that are able, to go to safer areas like the ones in neighbouring Texas counties, to conduct business transactions. In addition, individuals in Texas counties are less likely to go into Mexico to purchase cheaper products and services because of the threat of death.

Two other acts of the criminal violence, ones that are extremely targeted, are extortion and kidnapping. While bystanders can fall victim to flying bullets, it is unlikely that individuals would be accidently kidnapped or extorted because they were in the wrong place at the wrong time. Extortion would have an economic impact if firms are able to sustain payments. Firms that can sustain business under extortion could also benefit from the firms who are unable to meet extortion demands because they can capture a larger market share. Also, customers are not directly impacted by an extorted business, which means that their fear of safety is not impacted. They would be impacted indirectly because the extortion "tax" could be passed on to the price of the goods or services. While this could dissuade those that cannot afford the price increase, it will not dissuade economic transactions due to fear of death or injury. Therefore, the overall scope of impact on economic activity would be smaller.

Kidnappings are also targeted crimes. Like extortion, pain or death is less likely to occur unless a payment is not given. Also, like extortion, it is in the cartel's best interest to follow through on agreed arrangements otherwise individuals in the future will not cooperate. For example, if individuals are not released or are murdered after paying a ransom, then it becomes less likely that others will pay future ransoms. The overall scope of impact on economic activity will also be smaller because the act of kidnapping is assumed not to be random and therefore will not spread fear of safety.

Finally, we also believe that extortions and kidnappings will have a smaller detectable impact on the Texas border counties' economies because of under reporting. Homicides figures are more accurate because cartel killers need to send messages to those that oppose them. Therefore, they often go out of their way to assume responsibility for the murders they commit. However, it would be up to the victims of kidnappings and extortions to report these crimes. They have a low probability to do so because of retaliation from the criminal perpetrators. Under reporting of these crimes therefore presents with an inferential statistics problem. The missing observations can likely lead to findings that dismiss an association between extortions and kidnappings and Texas counties' economic performances. The data itself are reliable, but because it is a widely underreported crime, we assume that the measures are biased against the hypotheses and are conservative estimates of the impact; it may potentially have on the economic growth of the adjacent border cities. Whether due to targeting and fear or under-reported observations, our second hypothesis states,

- $H_{2a}$ : An increase in homicides on the Mexican side of the border will be associated with an increase in economic activity in the Texas border counties.
- $H_{2b}$ : An increase in extortions on the Mexican side of the border will be associated with an increase in economic activity in the Texas border counties. The impact of extortions will be less than the impact of the homicide variable.
- $H_{2c}$ : An increase in kidnappings on the Mexican side of the border will be associated with an increase in economic activity in the Texas border counties. The impact of kidnappings will be less than the impact of the homicide variable.

#### **Research Design**

We use cross-sectional time-series data to evaluate the influence of the different types of crimes and control variables on the Texas counties' gross sales and various economic sectors. One separate model for each type of crime measures the impact on economic growth. The analysis includes quarterly data for the years 2002–2014. The dependent variable is also used as a lagged (one quarter) variable on the right side of the equation in order to reduce auto-correlation. The

independent variables have also been lagged one quarter in order to demonstrate causal inference. The unit of analysis is the dyad of counties along the Mexico–Texas borderland. Some of the variables were logged (ln) because they possess skewed distribution. Logging the variables transforms their skewed distribution to a more normal one, which is necessary for regression analysis. The variables and their descriptions are listed in Table 1.

#### **Dependent Variable**

We use total gross sales as a proxy for overall economic performance. We also include some of the subcomponents of gross sales to determine if any specific economic activities were effected more than others. The subcomponents include retail sales, sales in the arts, entertainment, and recreation (AER) sector and sales in the accommodation and food services (AFS) sector. While the gross sales variable is a coincident indicator in this study for economic performance due to the significant role personal consumer spending plays in the health of the economy, we believe that the subcomponents can help provide a more thorough explanation of changing border economic dynamics in Texas due to the violence in the neighbouring Mexican state. The data come from the Texas Comptroller of Public Accounts.

#### Independent Variables

Homicide is one of the most frequently referenced measures of violence around the world. Compared with other violent crimes such as kidnapping and extortions, homicide has a relatively high report rate, in part because it is more difficult to hide than other crimes.<sup>57</sup> In addition, because homicide is such a sensational event, it is bound to be salient to decision-makers and individuals contemplating fleeing from the violence.<sup>58</sup>

The homicide levels were obtained from Mexico's National Institute of Statistics and Geography (INEGI) and are the levels for the entire bordering Mexican state. The homicide levels used in this study are not exclusively organised crime related homicides, but instead are all reported deaths by homicide. There are discrepancies between the statistics provided by the Mexican government for organised crime-related homicides and the statistics provided by numerous media outlets. For example, Molloy indicates that there are wide discrepancies between media reports and official statics.<sup>59</sup> Due to the significant limitations of the government data, besides media outlets, other non-governmental organisations and researchers produced independent data bases to record organised crime-related homicides. The inconsistency of the methodology and coding used to tally organised crime-related homicides is a large weakness that should be addressed regarding the use of government reported homicide numbers in this research. Nonetheless, other scholarship has used

Variable Name	Definition	Measurement	Source
Homicides*	Deaths resulting from armed	Reported number of	Instituto Nacional
	clashes or "execution-style" killings	murders	de Estadística y
	by or against members of an		Geografía
Vidnonnin ac*	organised criminal network	Departed number of	Convotoriado
Kiunappings"	liberty with the intention of	kidnanning victims	Secretariado Fiecutivo del
	obtaining ransom money or other	Kidhapping victims	Sistema Nacional
	benefit at the cost of the person		de Seguridad
	being held or a third party		Publica
Extortions*	The act of forcing an individual to	Reported extortion	Secretariado
	do, stop doing, or tolerate	victims	Ejecutivo del
	something with the goal of		Sistema Nacional
	obtaining a profit for themselves or		de Seguridad Publica
	physical or psychological violence		Tublica
DTO violence*	Violent acts between drug-	Reported number of	Organised
	trafficking organisations recorded	violent events	Criminal Violence
	by governmental agencies and		Event Data (Osorio
	newspapers		2015)
lotal gross sales*	lotal value of sales for all industries	US dollars	lexas Comptroller
Retail sales*	This sector comprises	US dollars	Texas Comptroller
netur sules	establishments engaged in retailing		of Public Accounts
	merchandise, generally without		
	transformation and rendering		
	services incidental to the sale of		
Arts/optortainmont/	merchandise.	US dollars	Toyac Comptrollar
recreation*	Recreation sector includes a wide		of Public Accounts
recreation	range of establishments that		of Fublic Accounts
	operate facilities or provide services		
	to meet varied cultural,		
	entertainment and recreational		
Accommodation and	Interest of their patrons.	US dollars	Toyac Comptrollar
food services*	Services sector comprises		of Public Accounts
	establishments providing customers		of Fublic Accounts
	with lodging and/or preparing		
	meals, snacks and beverages for		
	immediate consumption.	<b>D</b>	
Unemployment	The official concept of	Percentage	US Department of
	persons who are available to take a	unemployed	Labour, Bureau of
	iob and have actively sought work		
	in the past four weeks.		
Population*	The Texas Population Estimates	Total population	US Census Bureau
	Program produces annual estimates		
	of the total populations of counties		
	estimates of county populations by		
	age, sex, and race/ethnicity.		
Home sales*	Residential home sales	Total number of	Texas A&M
		residential home	University's Real
		sales	Estate Centre

Table 1. Variable descriptions.

\*Variables were logged (In) because of skewed distributions.

official homicide statistics.<sup>60</sup> Therefore, this study focuses on the overall number of homicides since it reflects the Mexican government's reported statistics for organised crime-related homicides and may also capture homicides that are also cartel related, but are not officially categorised in such a way.

Besides homicides, kidnapping and extortion come in next as a grave threat to citizen security. According to Rodríguez Araujo, "The more [the government] breaks up organised armed groups, the more others proliferate, seemingly without organisation 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".<sup>61</sup> Therefore, this study theorises that an increase in these crimes also has an effect on the economy of Texas border economies. The data for the 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).<sup>62</sup> In addition, we aggregate all three categories (homicides, kidnappings and extortions) into one variable called the crime index.

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. In general, an overall sense of fear leads one to assume that these crimes go widely underreported. Therefore, the data used in this study are the best estimated portrayals of the situation in Mexico during 2002–2014.

Given the government data issues previously discussed, we check the robustness of our models using figures from the Organised Criminal Violence Event Data project.<sup>63</sup> The dataset includes a measure of Drug Trafficking Organisation (DTO) violence reported by state and federal agencies as well as national and local news-papers from 2000 to 2010. The variable counts the number of reported events, while eliminating repeated accounts, on a weekly basis. The data were aggregated to the quarterly time frame so it is comparable to our data. Since it is an overall measure of crimes, we believe that it can be comparable to our crime index. The correlation of the DTO violence and crime index variables is very high (r = 0.855). The correlation of the logged transformed variables is also high (r = 0.771).

#### **Control Variables**<sup>64</sup>

We include control variables in the analysis that research has found affect economic performance. The first, population estimates, was obtained from the United States Census Bureau. Larger populations will have a larger pool of consumers that will influence the level of spending. The population variable was only available in yearly intervals, so we extrapolated to produce quarterly data to maintain the number of observations. The unemployment levels were compiled with data from the United States Bureau of Labour Statistics. The unemployment variable is especially important in accounting for the effects caused by the recession that the United States suffered from 2008 to 2010. The monthly values were aggregated to the quarterly level. Next, we include a variable for home sales. Home sales are included with the assumption that individuals who exited permanently either purchased or rented a home. As more individuals purchase new or pre-existing homes, they are more likely to increase spending, at least in the short term, on "startup items", like appliances, or preform renovations. In order to account for individuals who did not make permanent moves, a variable for temporary accommodations has been included. Home sales data come from Texas A&M University's Real Estate Centre. Lastly, we constructed a dummy variable to operationalise what is considered by many to have been cartel war years. A value of one is given to each dyad from 2010 to 2014, inclusive.

#### **Empirical Results**

The analysis begins by illustrating the differences and similarities of the Texas counties' economic activities since each county does have unique economic characteristics. Figure 1 plots the four dependent variables, on a per capita basis. Gross sales are somewhat similar as all four bands together with El Paso and



Figure 1. Per capital economic performance in Brownsville, El Paso, Laredo and McAllen.

Laredo on the upper end and Brownsville and McAllen at the lower end. We see more differentiation in the subcomponents. While Brownsville, El Paso and Laredo band together for retail sales, McAllen is lower. The values also show that retail sales are the largest component of the gross sales figures, representing approximately 60% of gross sales. There is more differentiation in the AER sector with Laredo in the upper end and McAllen at the lower end. The AFS sector displays a slightly different picture: Brownsville, El Paso and Laredo forming a band, and McAllen at the lower end. The figure demonstrates that the Texas border economies are not a monolithic geographic space and our model interpretations will need to include this fact.

The linear regression models, with panel-corrected standard errors, support our hypotheses. In Table 2a, the dependent variables are regressed on the crime index variable; in Table 2b, the variables are regressed on the DTO violence variable; in Table 3, the variables are regressed on homicides; in Table 4, the variables are regressed on kidnappings; and Table 5 has variables regressed on extortion levels. All of the models include controls for unemployment levels, population, home sales and the cartel war dummy variable. The models indicate that increased crime has a positive effect on Texas border county economic performance. The level of effect differs with the type of crime, which is consistent with the study's hypotheses.

Variable	Gross Sales	Retail Sales	AER	AFS
Gross sales	-0.230***	-	_	_
	(0.0804)			
Retail sales	-	0.763***	-	-
		(0.0569)		
Arts/entertainment/recreation	-	-	0.879***	-
			(0.0328)	
Accommodation and food services	-	-	-	0.979***
				(0.0123)
Crime index	0.0885***	0.111***	0.0300	0.00429
	(0.0310)	(0.0400)	(0.0351)	(0.0108)
Unemployment	-0.0670***	0.00279	-0.00963	-0.00301
	(0.0100)	(0.0157)	(0.0119)	(0.00346)
Population	0.899***	-0.171	-0.0265	-0.00544
	(0.0803)	(0.0900)	(0.0690)	(0.0199)
Home sales	0.313***	0.0918	0.0283	0.00639
	(0.0474)	(0.0494)	(0.0400)	(0.0109)
Cartel War dummy	0.216***	-0.0750	0.0189	0.0155
	(.0471)	(0.0600)	(0.0485)	(0.0150)
Constant	13.33***	6.19***	2.073*	0.446
	(1.014)	(1.83)	(0.899)	(0.349)
Number of observations	212	212	212	212
<i>R</i> -squared	0.861	0.817	0.858	0.984
Wald chi-sq	1867.1	2206.5	2046.5	25499.1

Table 2a. Results of gross sales, retail sales, AER, AFS, crime index, unemployment rate, population and period of violence dummy variable.

Unstandardised coefficients reported; Panel-Corrected Standard Errors in parentheses; All variables lagged by one quarter, except Cartel War dummy; See table one for variable transformations;  $***p \le .005$ ;  $**p \le .010$ ;  $*p \le .050$ .

Variable	Gross Sales	Retail Sales	AER	AFS
Gross sales	-0.242**	-	-	-
	(.0920)			
Retail sales	-	0.807***	-	-
		(0.0579)		
Arts/entertainment/recreation	-	-	0.917***	-
			(0.0289)	
Accommodation and food services	-	-	-	0.990***
				(0.0103)
DTO violence	0.0436**	0.0257	-0.0090	-0.0102
	(0.0169)	(0.0256)	(0.0197)	(0.0057)
Unemployment	-0.0557***	0.00686	-0.0121	-0.0062
	(0.0117)	(0.0190)	(0.0126)	(0.0039)
Population	0.860***	-0.149	-0.0140	0.0087
	(0.0910)	(0.104)	(0.0675)	(0.0211)
Home sales	0.377***	0.116*	0.0336	0.0020
	(0.0536)	(0.0571)	(0.0391)	(0.0123)
Cartel War dummy	0.161***	-0.0425	0.0395	0.0488
	(.0562)	(0.0918)	(0.0631)	(0.0197)
Constant	13.92***	5.23**	1.46	0.161
	(1.22)	(2.01)	(0.875)	(0.328)
Number of observations	172	172	172	172
<i>R</i> -squared	0.854	0.796	0.881	0.983
Wald chi-sq	1294.9	1522.7	2005.0	18636.6

Table 2b. Results of gross sales, retail sales, AER, AFS, OCVED, unemployment rate, population and period of violence dummy variable.

Unstandardised coefficients reported; panel-corrected standard errors in parentheses; All variables lagged by one quarter, except cartel war dummy; see table one for variable transformations; \*\*\* $p \le .005$ ; \*\* $p \le .010$ ; \* $p \le .050$ .

Variable	Gross Sales	Retail Sales	AFR	AFS
	0.220**	netali sules	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	711.5
Gross sales	-0.220**	-	-	-
	(0.0803)			
Retail sales	-	0.761***	-	-
		(0.0569)		
Arts/entertainment/recreation	-	-	0.876***	-
			(0.0335)	
Accommodation and food services	-	-	-	0.976***
				(0.0126)
Homicides	0.0751*	0.114***	0.0344	0.00748
	(0.0330)	(0.0366)	(0.0359)	(0.0107)
Unemployment	-0.0669***	0.00306	-0.00944	-0.00296
	(0.0102)	(0.0156)	(0.0120)	(0.00346)
Population	0.896***	-0.172	-0.0279	-0.00730
	(0.0806)	(0.0904)	(0.0693)	(0.0199)
Home sales	0.311***	0.0852	0.0254	0.00605
	(0.0488)	(0.0490)	(0.0402)	(0.0109)
Cartel War dummy	0.228***	-0.0779	0.0147	0.0129
	(0.0500)	(0.0594)	(0.0490)	(0.0148)
Constant	13.25***	6.28***	2.14*	0.505
	(1.02)	(1.85)	(0.917)	(0.357)
Number of observations	212	212	212	212
<i>R</i> -squared	0.860	0.817	0.858	0.983
Wald chi-sq	1831.2	2198.8	2054.5	25758.8

Table 3. Results of gross sales, homicides, unemployment rate, population and period of violence dummy variable.

Unstandardised coefficients reported; Panel-Corrected Standard Errors in parentheses; All variables lagged by one quarter, except cartel war dummy; see table one for variable transformations; \*\*\* $p \le .005$ ; \*\* $p \le .010$ ; \* $p \le .050$ .

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Variable	Gross Sales	Retail Sales	AER	AFS
Gross sales	-0.239***	-	-	-
	(0.0808)			
Retail sales	-	0.786***	-	-
		(0.0526)		
Arts/entertainment/recreation	-	-	0.878***	-
			(0.0304)	
Accommodation and food services	-	-	-	0.986***
				(0.0102)
Kidnappings	0.0420*	0.0486*	0.0225	-0.00317
	(0.0172)	(0.0215)	(0.0174)	(0.00520)
Unemployment	-0.0671***	0.00445	-0.00862	-0.00321
	(0.0100)	(0.0158)	(0.0120)	(0.00338)
Population	0.880***	-0.188*	-0.0447	0.00233
	(0.0798)	(0.0915)	(0.0705)	(0.0200)
Home sales	0.366***	0.142**	0.0486	0.00310
	(0.0464)	(0.0527)	(0.0400)	(0.0122)
Cartel War dummy	0.248***	-0.0386	0.0155	0.0228
	(0.0413)	(0.0568)	(0.0445)	(0.0132)
Constant	13.87***	6.12***	2.32*	0.253
	(1.05)	(1.81)	(0.923)	(0.326)
Number of observations	212	212	212	212
<i>R</i> -squared	0.860	0.815	0.858	0.984
Wald chi-sg	1825.34	2175.1	2062.7	25722.2

Table -	4. Results	of	gross	sales,	kidnappings,	unemployment	rate,	population	and	period	of
violenc	e dummy	var	iable.								

Unstandardised coefficients reported; panel-corrected standard errors in parentheses; All variables lagged by one quarter, except cartel war dummy; see table one for variable transformations; \*\*\* $p \le .005$ ; \*\* $p \le .010$ ; \* $p \le .050$ .

Table 5. Results of gross sales, extortio	ns, unemployment rate	, population and perio	d of violence
dummy variable.			

Variable	Gross Sales	Retail Sales	AER	AFS
Gross sales	-0.224**	_	_	_
	(0.0810)			
Retail sales	-	0.823***	-	-
		(0.0514)		
Arts/entertainment/recreation	-	-	0.895***	-
			(0.0278)	
Accommodation and food services	-	-	-	0.985***
				(0.00865)
Extortions	0.0260	0.0169	-0.00903	-0.00403
	(0.0172)	(0.0210)	(0.0158)	(0.00423)
Unemployment	-0.0676***	0.00395	-0.0116	-0.00340
	(0.0105)	(0.0160)	(0.0121)	(0.00340)
Population	0.907***	-0.123	-0.0127	-0.000063
	(0.0825)	(0.0882)	(0.0688)	(0.0183)
Home sales	0.341***	0.101*	0.0375	0.00548
	(0.0464)	(0.0507)	(0.0392)	(0.0108)
Cartel War dummy	0.280***	0.00578	0.0599	0.0231
	(0.0391)	(0.0526)	(0.0413)	(0.0126)
Constant	13.30***	4.71**	1.75*	0.293
	(1.04)	(1.74)	(0.854)	(0.279)
Number of observations	212	212	212	212
<i>R</i> -squared	0.858	0.810	0.858	0.984
Wald chi-sq	1722.5	2307.3	2037.9	25814.1

Unstandardised coefficients reported; Panel-Corrected Standard Errors in parentheses; All variables lagged by one quarter, except cartel war dummy; See table one for variable transformations; \*\*\* $p \le .005$ ; \*\* $p \le .010$ ; \* $p \le .050$ .

Table 2, parts a and b, reports that an increase in overall crime produces an increase in economic performance in the Texas border counties as measured by gross sales and retail sales. Table 2a uses the crime index, which includes homicides, extortions and kidnappings. The first model performs well as demonstrated by explaining 86.1% of the variation of gross sales. In our estimate, additional crimes on the Mexico side of the border have a positive effect on Texas border county economic performance. We reran the model for each border community given the previously discussed heterogeneity of their economies. Our more granular analysis indicates that crimes observed in Mexico have stronger positive impacts on gross sales in Brownsville than the other border communities. Also, and as expected, higher unemployment levels decrease sales and additional population and home purchases increase sales. The dummy variable marking the years of the cartel wars also has an impact sale, meaning that the years of violence do have a residual impact in addition to the level of crimes.

The second model also shows that the increase in crime index does increase retail sales. In this time, the crime index is the only variable that is statistically significant, aside from lagged retail sales. We therefore conclude that the crime index is a powerful predictor since it and the lagged dependent variable explain 81.7% of the variance. In re-running the model for each community, we discovered that Laredo had the largest impact on their retail sales. Finally, although our crime index does not impact, in general, the AER and AFS economic sectors, our community level models show that the AFS sectors were positively impacted by Mexican crime in El Paso and Brownsville.

Table 2b substitutes DTO violence for the overall crime index, with similar results. DTO violence is statistically significant in predicting the value of gross sales, along with the control variables and the lagged dependent variable. Retail sales cannot be predicted by DTO violence. The control variables in the second model also cannot explain the levels of retail sales, with the slight exception of home sales. Last, neither arts, entertainment and recreation values nor sales in the accommodation and food services sector can be explained by either the crime index or the DTO violence variable.

Table 3 reports the model with homicides as a stand-alone crime. The first model includes gross sales at the dependent variable. Like the crime index model, we see that increases in homicides in the adjoining Mexican state predict increases in gross sales. Again unemployment has a negative impact, while population, home sales and the cartel war dummy have a positive impact. The second column substitutes retail sales as the dependent variable. Like Table 2a, increases in homicides are the only statistically significant predictor for retail sales other than the lagged dependent variable. The two variables explain 81.7% of the variance. The results in columns three and four indicate that arts, entertainment and recreational nor accommodations and

food services spending can be explained by the level of homicides in adjoining Mexican states. In our individual, community models, however, we see that homicides have the strongest effects in the El Paso and Brownsville AFS sectors.

Table 4 substitutes the number of kidnappings as our main independent variable. While kidnappings are statistically significant, the size of the coefficient is smaller than homicides by approximately 44%. In our community level models, the strongest effect was in Brownsville. The second column examines the impact kidnappings have on retail sales. There is statistical significance; however, the coefficient is small compared to the homicides variable (57.3% lower). There are several factors that could be attributed to the result. First, as we argued in theoretical terms, kidnapping may not be as salient of a crime as homicides. Kidnappings target a very specific population: affluent persons, business owners or their families. Therefore, a realistic threat of becoming a victim of a kidnapping is low. Also, one is not often "accidently" kidnapped like one can be murdered in a cartel sanctioned homicide. Finally, the smaller size of the coefficient may be due to the under reporting of kidnappings we previously discussed. The strongest effect of kidnappings on retail sales was in El Paso and Laredo. Column three and four again demonstrate that violence in neighbouring Mexican states does not predict AER nor AFS sales. However, the AFS sector was positively impacted in Brownsville.

Our last set of results indicates that a number of extortions do not have a statistically significant effect on gross, retail, AER and AFS sales (see Table 5). This leads us to accept that homicides have a greater impact on increases in gross and retail sales than extortions. Extortion is a crime that much like kidnappings targets a specific population. It is also possible to be under reported.

According to the results, we can infer that the impact of aggregate criminal activity has a significant impact on the economic performance in both gross and retail sales of Texan border counties. The finding supports previous studies that US border cities with large retail sectors tend to be more integrated with the Mexican economy and Mexican cities with a large maquiladora sectors are more integrated with the US economy: Changing conditions in one economy will affect the other.<sup>65</sup> However, when measuring the influence of specific isolated crimes on economic performance, certain crimes appear to be more significant than others. This suggests that crimes, like kidnappings and extortions, may not be as salient as other crimes, such as homicides. However, when aggregated together with homicides, they may contribute to the overall sense of insecurity that produces economic flight into Texan border counties. Last, we see some variation among the individual communities regarding the impact of overall crime, and certain crimes had on their economic sectors.

#### Conclusions

We began our study by questioning what impact, if any, the increase in violence on the Mexico side of the border had on the economic performance of the adjoining Texas counties. While many pundits argued that it would drive commerce away, we argue that the fluidity of the border due to high levels of social and economic integration, legal permissibility and little to no violence on the Texas side promoted economic performance in our study's counties. Further, we theorised that the interdependent Mexico-Texas borderland<sup>66</sup> is a semi-permutable membrane that provided consumers and business people the option to exit a violent environment and enter a stable one for market activity while keeping out the cartel war driven violence. If the social stability of a city is deteriorating and hampering the maximisation of economic utility and consumer satisfaction due to reasons outside of the control of firms and consumers, actors will seek to maximise utilities by exiting and conducting transactions in a less violent environment. In turn, US consumers and businesses that would normally conduct economic transactions in Mexico due to lower prices recalculated the cost of crossing when factoring in the criminal violence. Making purchases in the Texas border counties now proved to be a better way to maximise their economic utility.

Our examination of the Texas County economic performance included both aggregated and subcomponent economic sectors. Aggregated sales did grow as the violence in Mexico increased, as did retail sales. The violence did not harm the AER and AFS sectors. This further demonstrates that social conditions in the Texas counties were basically performing under normal conditions. It is, however, difficult to say what type of behaviour we are observing. It may be possible that Mexican residents were not going to their neighbouring Texas counties because the violence disheartened entertainment-type consumerism. Perhaps the extra cost of retail purchases on the Texas side made entertainment consumerism unattainable. Also, the effect could be explained by more Texans taking advantage of local entertainment and therefore offsetting any decline in Mexican consumption. This more granular explanation is outside the scope of this study and will require further investigation.

We also explored if some categories of violence would better explain the motivation of consumers and producers. We argued that the level of homicides would be the strongest factor, given that the extreme fear it can produce. The public killings by cartel members were intensified by the number of bystanders slain and the gruesome displays of the targeted individuals. Other categories of the violence, kidnappings and extortions, would be less a factor given the clearly targeted nature of these crimes. Although these two crime categories would contribute to the overall fear that motivates where to conduct economic transactions, they are not the most salient factors. The most salient factor is the homicide level. We demonstrated that overall Mexican cartel-related violence did have a positive impact on the economic performance of the Texas border counties between 2002 and 2014. In addition, some community level economic sectors benefited more than the same sectors in other communities. The evidence supported our argument even when including other known predictors of economic performance such as population size, unemployment levels and home sales and an alternative measurement of violence. We also demonstrated that the main factor that explains Texas border county retail sales performance, the surge in violence, is captured in the crime categories as evidenced by the lack of statistical significance of the cartel war-years dummy variable.

Our research demonstrates that positive economic outcomes are possible when one side of a political border experiences a high level of violence. Prior research primarily focused on the negative impacts. However, it is important to note that the positive effects discussed and demonstrated in this article are due to the interdependent characteristic of the Mexico-Texas border. Future research needs to compare Mexico-Texas with other interdependent borders to see if we can observe similar patterns. It would be interesting to also vary the strength of political institutions on either side of the border to examine if the positive effect remains. Theoretically, we assumed that the stronger political institutions on the Texas side provided a violence-free environment that motivated Mexican consumers and producers to exit their markets and enter the Texas border market while simultaneously convincing their US counterparts to stay in the Texas market. Lastly, it would be interesting to see how much of the economic activity was due to Mexicans crossing as compared to Texans deciding to forgo transactions in Mexico and stay in their home counties. This question could be explored by considering the amount of EB-5 visa applications during this time. Knowing the answer to this question would allow us to refine our theory to better explain how consumers and business people weigh their options. The findings could also be further strengthened by triangulating the findings with surveys or interviews of individuals who exited into the US side of the border.

#### Notes

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- 62. We also consulted the Atlas de la Seguridad y la Defensa de México (2009 and 2012) for our crime variables and discovered a high correlation with current data (r=0.795). Given the limited years in the Atlas variables, we decided to use the government crime values; Atlas de la Seguridad y la Defensa de México. 2009 and 2012. Colectivo de Análisis de la Seguridad con Democracia. http://www.casede.org/index.php/publicaciones.
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- 64. We went to great lengths to include as many alternative explanations. However, we were limited by the economic data collected by local agencies.
- 65. Phillips and Cañas (note 41); Niño et al. (note 20); Ayala Gaytán et al. (note 20).
- 66. Martinez (note 18).