UNIVERSITY OF CALIFORNIA SAN DIEGO

Drug Wars, Organized Crime Expansion, and State Capture

A dissertation submitted in partial satisfaction of the requirements
for the degree Doctor of Philosophy

in

Political Science

by

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2023

The dissertation of Marco Alcocer is approved, and it is acceptable in quality and form for publication on microfilm and electronically.

University of California San Diego

2023

DEDICATION

To my mamá, Lulu, who, as a single mother, took her two young kids to the United States where she did not have any friends or family to give us a better life. Her bravery, strength, and unconditional love and support are the reasons I am the person I am and have been able to accomplish what I have. Also to my sister, Carla, with whom I share an unbreakable bond.

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ACKNOWLEDGEMENTS

I want to thank Sebastian Saiegh, my advisor, dissertation chair, mentor, friend, and to whom I owe my academic career. His endless support, advice, and help, regardless of my shortcomings and mistakes, has made me a much better researcher and academic than I would have been without him. I could not have asked for a better advisor. I also especially thank James Fowler, Rafael Fernandes de Castro, and Agustina Paglayan for supporting me throughout the PhD program and showing continuous interest in my development and success, and to Gareth Nellis for his guidance during the job market. I thank my dissertation committee members, James Fowler, Rafael Fernandes de Castro, Simeon Nichter, Federica Izzo, and Francisco Cantu. I thank all the faculty at UCSD that taught, helped, and supported me along the way, and the staff members who were always so helpful. I also want to thank all my undergraduate teaching assistants, without whom I would not have completed the dissertation: Kaylynn, Heather, Lorena, Marcella, Zachary, Daniel, Andres, Lucianne, Manuel, and Tiffany from UCSD and Jacqueline and Silvia from the University of Guanajuato. Given the sensitive topic of the dissertation I omit their surnames.

I am very grateful to the Center for U.S.-Mexican Studies, in particular Rafael Fernandes de Castro, Cecilia Farfan-Mendez, Greg, and Adana. Being a part of this interdisciplinary center pushed me to think in new ways, challenged my own viewpoints, and helped me grow intellectually. I am incredibly thankful to the political science department at ITAM where I finished my dissertation. Thanks to Alberto Simpser and Mateo Vasquez-Cortes for the opportunity, and to Juan Pablo Micozzi, Horacio Larreguy, Adrian Lucardi, Alexandra Uribe Coughlan, Antonella Bandiera, Adirana Alfaro Altamirano, and Vidal Romero.

I also want to show my appreciation for those individuals that had a particularly important role in my path towards the PhD. I thank Desmond Arias, who gave me a chance to work for him as a research assistant when I was a master's student at George Mason University and helped me get into doctoral programs. I thank Richard Baum, who guided and mentored me during my

time at the White House. He helped me transition form being a wide-eyed naive young adult to a thoughtful critical thinker with a more nuanced understanding of the world. Without them I would not be at UCSD. I also thank Dr. Bob Snyder at Southwestern University for believing in me and supporting me during my undergraduate journey.

Personally, I want to thank my family. My mother Lulu, my sisters Carla and Andrea, my dad Roberto, and my grandmother Josefina. I want to especially thank my cousin Andres and his wife Jaqui, who let me stay at their home when I did months of fieldwork in Guanajuato. Thanks to them and the Garcia family I felt at home while doing fieldwork. I also want to thank my aunt Beatriz for always being willing to accompany me in my adventures. I want to thank Natsumi for being such a special part of my life during my formative years in the PhD program. She saw me grow as a person and scholar, listened to my endless academic rants, and put up with all the time I spent studying rather than with her. I thank Dina for her companionship through the PhD program and the happiness she brings to my life. The peace she continuously brings me eases the stresses of academia. Finally, I want to thank Anahí for sharing the last few steps of the dissertation writing process with me and making them so enjoyable.

I want to thank my coauthors. Patrick Signoret, for teaching me how to be so rigorous and meticulous, showing me the value of qualitative research, and becoming such a great friend. Cecilia Farfan-Mendez, for always questioning Patrick and me and making us think more critically, and for always going out of her way to support our research. Megan Erickson, for putting structure into my shapeless thoughts, questioning my thinking, and becoming a very good friend. Hannah Baron and Angie Torres-Beltran, for continuously teaching me new perspectives and exploring Mexico City with me. Leonardo Falabella, for being so diligent and thoughtful, and for being such a great friend. Rachel Skillman, for always providing such enthusiasm and energy. And Fernanda Sobrino, Alexandra Lange, Nicholas Smith, and Maureen Feeley.

The list of those who have played a part, large or small, in me being here is endless. I apologize for those I have missed and not included.

VITA

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ABSTRACT OF THE DISSERTATION

Drug Wars, Organized Crime Expansion, and State Capture

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Doctor of Philosophy in Political Science

University of California San Diego, 2023

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Scholars have long argued that organized crime expanding outside their historical strongholds is extremely difficult and rare since these groups rely on local networks and are unable to operate without some degree of state protection, which they often lack outside their historical strongholds. Yet, Latin America is currently experiencing significant criminal expansion. Why do criminal organizations expand beyond their historical strongholds and what explains where they go? How are criminal organizations able to enter and successfully establish their presence in new territories? Moreover, what are the consequences of criminal organizations entering new political jurisdictions for local democratic accountability, politics, and citizen well-being? I argue that government intervention in the drug market through a drug war can create a shock that pushes

specialized drug cartels to diversify their activities beyond drug trafficking to protect their finances by spreading the risks associated with their investments. I further argue that cartels diversifying their activities can lead them to expand their presence to territories outside of their strongholds in search of new lucrative business opportunities. To protect their new activities in the territories they expand to, cartels actively seek to obtain state protection by capturing local state actors. When successful, they can operate with some degree of impunity and worsen citizen well-being. To test the theory I turn to Mexico, where I provide evidence that the government's War on Drugs declared in December of 2006 pushed specialized drug cartels to diversify their activities, and particularly, that all cartels began stealing oil from pipelines. To analyze patterns of expansion, I use a novel dataset on the geographic presence of cartels in Mexico and leverage a temporal shock (War on Drugs) and geography (location of new business opportunities). I show that the crackdown pushed cartels to strategically expand to territories with oil pipelines, and that cartels entering new territories reduced local electoral competition and increased violence and crime. Finally, I illustrate how cartels enter new territories and establish their presence by capturing state actors through qualitative case studies of municipalities with oil pipelines that saw cartel intrusion following the government crackdown.

Chapter 1

Introduction

1.1 The Problem

For decades, Mexico's underworld was dominated by a handful of powerful criminal organizations that specialized in the most lucrative illicit activity in the country: providing wholesale illicit drugs to the world's largest consumer market, the United States. In Mexico, these specialized drug trafficking organizations became known as "drug cartels." By 2006, conservative estimates suggest that drug trafficking made Mexican drug cartels $10 billion US Dollars (USD) per year (DHS 2010; Rizzo 2019). Drug cartels had historically operated in limited regions of the country, mainly those central to drug cultivation, production, and trafficking. These drug cartels had amassed tremendous amounts of power in their strongholds over the decades, creating strong ties with communities and political and economic elites.

Through the 1990s and early 2000s, these powerful drug cartels began a series of prolonged wars against each other, increasing violence in specific regions of the country. In response, the newly elect president declared war against drug trafficking in December of 2006 and deployed thousands of troops across the country with the goal of curtailing drug trafficking and dismantling drug cartels.

However, rather than eliminating the drug market and disbanding these illicit organizations, drug cartels in Mexico began to evolve in unexpected ways—a change the government soon began to observe. For example, on November 2007 the Mexican military seized 820,000 liters of stolen fuel meant for resale in the black market along with 30 tanker trucks in the northern state of Tamaulipas, all allegedly from the Gulf Cartel (Carrazco Araizaga 2007). In January 2008, thirty members of the Zetas Cartel were apprehended in the state of Coahuila, and by their own admission, one was the local leader in charge of kidnapping for ransom, another was in charge of local drug dealing, and another in charge of stealing fuel from oil pipelines (Noroeste 2015). In February 2010, the Mexican Federal Police arrested a local boss of the Sinaloa Cartel in the state of Guerrero who oversaw illegal logging in that region (Proceso 2010). Authorities soon realized that drug cartels were undergoing a major transformation, evolving from being primarily drug traffickers to what I call *criminal enterprises*, or criminal organizations systematically involved in a diverse set of activities—from drug trafficking to extortion, kidnapping for ransom, property theft, local drug dealing, oil theft, migrant smuggling and trafficking, extorting the avocado industry, looting mines, natural gas theft, and illegal logging, among others.

At the same time, despite the government crackdown, cartels began to expand geographically, extending their presence and operations beyond their historical strongholds. For example, drug cartels went from having presence in about 5% of Mexican municipalities before 2006 (those central to the drug trade) to operating in over 25% of municipalities by 2017.[1] Moreover, this expansion has not been transient: cartels have successfully entrenched their presence and operations in many of the new territories they have entered.

Cartels diversifying their activities has had detrimental consequences not only for the markets they are now involved in, but also for citizens. While Mexican cartels used to operate in the underworld as they moved tons of illicit drugs to the United States, they now operate in common spaces and frequently extract rents from citizens through extortion, kidnapping for

[1]This data is presented in a later chapter.

ransom, property theft, among others. Moreover, the geographic expansion of cartels has also meant that an increasing number people are being exposed and subjected to criminal governance, or "the imposition of rules or restrictions on behavior by a criminal organization" (Lessing 2021, 3).

Beyond illicit markets and criminal governance over an increasing proportion of the population, drug cartels expanding their operations to new territories has had serious political consequences. Cartels entering political jurisdictions where they had previously not operated meant they began seeking to build protection networks with local state officials through carrots and, often, sticks. For example, cartels had not operated in the state of Guanajuato, but began entering the state starting in 2008, making it a cartel hotspot within ten years, killing hundreds of police officers and dozens of politicians in the process.[2]

1.2 Literature and Research Questions

Mexican drug cartel diversifying their activities beyond drug trafficking and expanding beyond their historical strongholds are both puzzling from perspective of the prevailing theories in the literature.

First, the longstanding conventional wisdom across academic disciplines is that drug cartels, and criminal organizations more broadly, are profit-maximizing economic actors (e.g., Schelling 1971; Jennings 1984; Burrus 1999; Poret 2002; Allum and Siebert 2003; Finckenauer 2005; Baccara and Bar-Isaac 2008; Dell 2015; Lessing 2017; Castillo and Kronick 2020).[3] This framework has provided considerable insights into how drug cartels choose trafficking routes (Dell 2015), when they use violence against the state (Lessing 2017), and when they use violence against rival cartels (Castillo and Kronick 2020; Trejo and Ley 2020), among other questions,

[2] See Chapter 8 for a detailed overview.

[3] The literature is too large to cite, I cite some key canonical works from political science, economics, and criminology here.

it falls short in explaining why Mexican drug cartels diversified their activities beyond drug trafficking—the most profitable illicit activity in Mexico.

This is because activity diversification implies budget-constrained drug cartels choosing to invest part of their returns in activities that are less profitable—and in some cases *far* less profitable—rather than re-investing all their profits back into drug trafficking in order to maximize profit. Diversification thus results in a portfolio that is less profitable than one that remained specialized in drug trafficking. Moreover, Castillo and Kronick (2020) argue that drug cartels make more profits from drug trafficking under government drug wars due to a shortage of supply and inelastic demand. Given this theory, under the Mexican War on Drugs, cartels should invest all their capital in drug trafficking to maximize their profits. This makes activity diversification during a government crackdown against drug trafficking even more puzzling from the profit-maximizing perspective.

Consequently, existing theories cannot explain why cartels would choose to diversify and not maximize profits. Why, then, did drug cartels that had been highly specialized drug traffickers for decades suddenly begin diversifying their activities, especially to less profitable activities?

Second, cartel geographic expansion in Mexico is puzzling both because it is occurring precisely during a period of a government crackdown against cartels, and because scholars have long argued that organized crime expansion is extremely hard and rare (Reuter 1985; Gambetta 1993). For one, scholars have long argued that criminal organizations also depend on their social embeddedness, reputation, local knowledge, ability to monitor agents and collect reliable information, and networks with political, social, and economic elites to operate and survive (Reuter 1985; Gambetta 1993). Moreover, a growing body of work by scholars of Latin America argues that criminal organizations cannot survive without some degree of state protection, cooperation, or collusion. For example, Arias (2017) argues that criminal organizations "must find ways to work with the state or receive protection from the state to function" (10). Durán-Martínez (2017) states that criminal organizations "depend on the direct or indirect support of state actors

to survive" (37). Lastly, Trejo and Ley (2020) argue that "organized crime can only exist when criminal organizations gain some level of state protection to operate illicit markets" (38). In their historical strongholds, criminal organizations have built these networks and established their protection networks over many decades.

Yet, when criminal organizations expand to new territories where they have never operated, they often do not count with the political protection or local networks they have successfully established over decades, or centuries, in their historical strongholds, which is why their geographic expansion is so rare. Indeed, research in Europe and the United States has found that the expansion of mafias has not been a result of strategic choices but rather a byproduct of migration waves and government policies that relocate mafia members (Varese 2006, 2011; Scognamiglio 2018; Dipoppa 2021). This is also why the vast majority of existing literature studies criminal organizations in their historical strongholds.

In Mexico, drug cartels enjoyed state protection in their historical strongholds for decades. However, when Mexican drug cartels began expanding geographically, they often lacked the local networks and state protection in the new territories they moved to outside of their strongholds. If cartels need state protection to operate, how were they able to successfully move into and establish their presence and operations in new territories?

Finally, the geographic expansion of Mexican cartels also leaves questions unanswered about its implications for politics and citizen well-being given the lack of research on the topic. First, research in Latin America has highlighted the negative impact that criminal organizations can have on democratic accountability in their strongholds, particularly at the local level (Arias 2017; Trejo and Ley 2020; Albarracín 2018; Córdova 2019; Bullock 2021). However, given that the dynamics are likely different in the territories where cartels have recently expanded to, should we expect to observe these same detrimental political effects? In other words, what are the political consequences of cartels expanding to new territories?

Second, an estimated 13% of the population, or 80 million people, in Latin America live

under criminal governance. This is a grave problem for citizen well-being in the region. For example, Latin America is the most violent region of the world despite having no active civil conflicts—it has less than 10% of the world's population but makes up 35% of all homicides—and this violence is driven primarily by criminal organizations (Muggah and Aguirre 2018; Rettberg 2020). With Mexican cartels expanding geographically within Mexico, the number of people living under criminal governance in the country is most likely growing significantly, perhaps worsening citizen well-being. However, it remains to be answered whether the detrimental effects of criminal organizations are restricted to their strongholds or whether they are also being exported to new territories? That is, what implications does cartel geographic expansion have for citizen well-being in the territories that cartels are expanding to?

1.3 Objectives

This dissertation seeks to analyze the transformation of Mexican cartels from specialized drug trafficking organizations to criminal enterprises systematically engaged in a host of illicit activities, the role that government policy—and specifically the War on Drugs—had in driving this transformation, and the detrimental consequences this transformation had on local democratic accountability and citizen well-being. In particular, I seek to explain three critical moments: (i) how the government War on Drugs drove drug cartels to diversify their activities and enter new markets, (ii) how cartels began strategically expanding their presence as a consequences of their decision to diversify their criminal portfolios, and (iii) how cartels entered new political jurisdictions and successfully entrenched their presence and operations by capturing local governments, eroding democratic accountability and state institutions in the process.

In seeking to explain these moments, I draw and build on existing theoretical concepts while also questioning some foundational assumptions and conventional wisdom in the literature. In doing so, I provide new theoretical insights into how criminal organizations make strategic

decisions, how government policies impact this strategic decision-making, and, centrally, how powerful criminal organizations seek to capture the state to influence its behavior, allowing these criminal organizations to operate with some degree of impunity. Empirically, I draw on a series of novel datasets on Mexican drug cartels, both quantitative and qualitative, that allow me to uncover new evidence about cartels, their interactions with the state, and their consequences for politics and citizen well-being.

1.4 The Argument

I begin by arguing that viewing cartel leaders, or "drug lords," as common criminals or bellicose actors underestimates their sophistication and overlooks their economic incentives. For these reasons, scholars across different disciplines contend that criminal organizations should be analyzed as strategic economic actors whose goal is to maximize profits. I go beyond this conventional wisdom by proposing that one important way of understanding cartel leaders is as really savvy investors or businessmen that make strategic decisions about their finances given market conditions. This is a subtle but important difference, as it can imply different strategic behavior than simply maximizing returns.

Using this framework, I seek to understand the role that government policies have on the behavior of drug cartels. Specifically, I focus on government policies that target the illicit drug market through intensified enforcement efforts, colloquially known as a War on Drugs or government drug war. These policies can take different forms, but to the extent that they disrupt the drug market, then cartel investments in drug trafficking can become much riskier because the probability that drug shipments get seized, drug traffickers get arrested, and warehouses get raided, to give some examples, increases.

Centrally, I argue that in response to this shock to the drug market, drug cartels face strong incentives to diversify their activities. This is because in business, relying on one source

of revenue when there is market volatility is a risky move. Under government drug wars, cartel leaders will recognize that if they remain specialized drug traffickers there is a high probability that they will lose their investments in drug shipments, leaving them scrambling to find a new source of revenue during already adverse times. Thus, for investors seeking to minimize this risk, diversification is a sound strategy since it reduces risk by allocating investments across various markets and industries that react differently to the same event. In other words, diversification has the aim of minimizing losses. So when cartels are facing strong government enforcement through a drug war, instead of attempting to maximize returns by investing in the most profitable activity—drug trafficking, cartels may seek to enact a defensive position by diversifying. However, by reducing risk through diversification, an investor is also accepting that they are willing to take less profit in exchange for the preservation of capital.

Moreover, as stated, if cartels choose to diversify, we should expect them to look for investments whose returns are not positively correlated with the returns of their preexisting investment—drug trafficking. The intuition is straightforward: Diversifying to activities whose returns are unaffected by shocks to drug trafficking means that if there is a negative shock to investments in drug trafficking due to the government's War on Drugs, the revenues from other activities remain unaffected or even increase. This assures a steady stream of profits.

The decision to diversify, I argue, has important geographic implications because if cartels decide to diversify to activities that can only be fully exploited outside of their strongholds, then they face incentives to strategically expand to the territories with these new business opportunities. First, some activities that cartels may choose to diversify to can be perpetrated anywhere, such as extortion, theft, and drug dealing. However, other activities can only be done in certain places, for example, illegal logging, looting mines, wildlife trafficking, migrant trafficking, and oil theft. And if cartels decide to diversify to these activities, then they face incentives to expand to the territories with these new business opportunities.

Once they enter new territories in search of new business opportunities, I argue that

criminal organizations seek to capture state officials to obtain state protection and safeguard their new activities. In other words, criminal organizations seek to recreate the state protection they possess in their strongholds in new political jurisdictions in order to establish and protect their criminal activities and profits. I argue that they accomplish this by capturing local government officials, including politicians and civil servants, which provides criminal organizations the freedom to operate without fear of arrest and protects their profits by reducing state efforts to confiscate their goods and assets.

One important implication of this process is that criminal organizations negatively impact local democratic accountability in new territories they enter by reduce electoral competition, either by providing electoral benefits to their captured politician or using coercion against rival politicians. It also impacts how the government provides public goods, particularly public safety, as captured police actively condone and permit criminal organizations to perpetrate violence and crime, worsening citizen well-being.

Moreover, note that this implies different behavior than the logic of profit maximization. Scholars have found that government drug wars make drug trafficking more profitable (Caulkins and Reuter 2010; Castillo and Kronick 2020), meaning that they should not create any incentives for drug cartels to diversify. On the contrary, the illicit market becomes even more lucrative, creating incentives for cartels to remain specialized drug traffickers.

In sum, the argument provides some key testable expectations. First, drug cartels should diversify their activities following the government War on Drugs. Second, Cartels should subsequently expand geographically to territories with lucrative new business opportunities. Third, political jurisdictions experiencing cartels entering their territories should see attempts by cartels to capture state officials. Fourth, attempts of state capture by cartels should reduce electoral competition and increase crime and violence.

1.5 Empirical Approach

To test the theoretical claims, this dissertation fully embraces a multi-method approach. Through the dissertation I draw on both quantitative and qualitative evidence and methods, with the belief that one type of evidence does not have scientific superiority over the other or that one is subservient to the other, for example, that qualitative information can only used to interpret quantitative results.

Instead, I seek to use rigorous and systematic methods and evidence, whether it be qualitative or quantitative. This philosophy sees different methods as having their strengths and weaknesses, with some being more or less appropriate for certain questions. Where qualitative methods can provide more convincing evidence, I rely on qualitative tools, and, in turn, where quantitative methods are most appropriate, I employ statistical techniques. This approach follows that what some multi-method scholars call integrative multi-method research (Seawright 2016; Goertz 2017), where different methods are used to answer different components of an argument, as opposed to approaches like triangulation or nested analysis where multiple methods are used to answer the same research question and results are compared (Lieberman 2005).

1.6 Findings

To test this theory and its implications I turn to Mexico, a middle income country where specialized drug cartels had operated for decades, and where the federal government declared a war against drug trafficking in December of 2006.

I first provide qualitative evidence that Mexican drug cartels quickly began diversifying following the government drug war. I do this by creating a qualitative dataset tracking the activities of each drug cartel and the time they entered each activity from 2000 to 2018 and exploiting the timing of the crackdown. I also explore the diversification strategies of each drug cartel, highlighting the implications this financial decision had for the internal organization of

cartels and the prevalence of the crimes they diversified to.

One key finding is that all cartels turned to stealing refined oil products from underground pipelines and that this became a fundamental part of their new diversified portfolios. This is interesting because oil theft was not an obvious activity to enter. Consistent with the theory, I provide evidence that oil theft helped cartels minimize the risks associated with their investments given their preexisting involvement in drug trafficking. Additionally, an important characteristic of this activity is that one needs to extract the oil products from oil pipelines and these are geographically fixed and most run through territories where cartels did not operate prior to the government crackdown. Thus, if cartels wanted to fully exploit this market, they had to expand to territories with oil pipelines.

To investigate cartel geographic expansion and its consequences empirically, I create a novel panel dataset on the geographic presence of cartels in Mexico, and leverage (i) a temporal shock (War on Drugs) that pushed Mexican drug cartels to diversify their activities and expand beyond their historical strongholds and (ii) geography (new business opportunities) to identify where these cartels moved. Specifically, I create a novel dataset on where Mexican cartels operated at the local level per year between 2000 and 2017 (Sobrino et al. 2022). To create this dataset we scrape over 1.3 million articles from Google and Google News using municipality-cartel pairs, use a convolutional neural network (CNN) to discard irrelevant information, and then use natural language processing to extract the location each cartel was operating in per year. The resulting dataset identifies whether cartels were operating in a given municipality per year.

Using data the georeferenced location of the pipelines and information on federal operations against drug trafficking, I estimate a staggered spatial difference-in-differences and find that the government crackdown led cartels to expand, and particularly, to target that expansion to territories with oil pipelines. Using a conservative model, I find that cartel presence doubled in municipalities with oil pipelines after the crackdown when compared to other municipalities.

I then exploit this targeted expansion following the crackdown to estimate the effect that

cartels have on local democracy and citizen well-being. However, studying the political and criminal consequences of organized crime expansion is difficult because where cartels move is not random. To overcome this endogeneity concern, I instrument the presence of cartels with the location of oil pipelines after the crackdown. Using data on local elections in Mexico, I find that cartels depress local democratic accountability by reducing electoral competition and the number of candidates running for office. Following the argument that capturing the local state apparatus allows criminal organizations to establish their operations, I also estimate the effect that cartels have on crime and violence using the same empirical strategy and find that they increase violence, theft, kidnapping, and drug dealing.

Finally, I examine state capture by cartels in territories they had previously not operated but that experienced cartel intrusion following the crackdown through in-depth qualitative case studies of municipalities with oil pipelines in Central Mexico. The case studies investigate the mechanisms through which cartels entering new territories worsened local democratic accountability. Thus, the case studies build credibility in the consequences of expansion proposed by the theory and estimated by the quantitative analysis, provide insights into the mechanisms of state capture, and add nuance through a real-world example.

These results as a whole demonstrate that heavy-handed government crackdowns can have unintended political consequences by pushing criminal organizations to extend their tentacles beyond their strongholds and depress democratic accountability in the places they expand to. They also show that criminal organizations moving into a territory deteriorates citizen well-being by increasing crime and violence.

1.7 Implications and Contributions

One important conclusion that can be drawn from this paper is that heavy-handed government responses targeting criminal organizations, and their revenues more specifically, may

backfire and have detrimental *political* consequences. Together with existing studies, this paper suggests that government crackdowns may need to be reconsidered. Lessing (2017) argues that conditional crackdowns—crackdowns that explicitly only target violent criminal organizations—can address the negative consequences crackdowns have on levels of violence. However, this does not address organized crime diversification, expansion, or its consequences. Further discussions and research is required to either design anti-organized crime policies that address the incentives introduced here and preclude their diversification and expansion, or to create alternatives to crackdowns that address their negative externalities.

The theory presented by this paper provides policymakers and scholars with a novel framework to analyze the economic incentives of criminal organizations. Incorporating how criminal organizations consider financial risk, not just profits, into our understanding of criminal organizations may uncover new insights that were previously puzzling. Of particular importance to political scientists is analyzing how government policies affect the behavior of criminal organizations, including understanding which activities they are involved in and its geographic implications. Understanding how government policies meant to combat organized crime can push criminal organizations to enter new markets and expand geographically is both important and innovative, especially given that tough-on-crime policies are increasingly common in Latin America.

Finally, while this paper focuses on one reason criminal organizations strategically expand, new business opportunities, this is likely just one contributing factor. Future research is needed to uncover additional factors that improve our understanding of organized crime expansion and its consequences. Studying the drivers and consequences of organized crime expansion is increasingly important because criminal organizations in Latin America continue to expand their operations to new territories. However, there are likely many other consequences associated with organized crime expansion beyond those investigated in this study. Future scholarship would benefit from increasing its focus on investigating organized crime expansion and its consequences.

Given the argument and evidence, the main contributions of this dissertation are threefold. First, it contributes to the longstanding theory that criminal organizations are profit-maximizers by providing a more nuanced proposition—they care about maximizing profits *and also* about minimizing risks to their investments. This framework has the potential to provide new important insights about criminal organizations. Second, it analyzes the determinants and pattern of organized crime expansion. While there exists a large body of work investigating the violent repercussion of government crackdowns against criminal organizations (e.g., Calderón et al. 2015; Osorio 2015; Dell 2015; Lessing 2017; Castillo and Kronick 2020; Trejo and Ley 2020; Barnes 2022), the literature has given much less attention to other consequences, such as expansion, facilitating recruitment for prison gangs (Biondi 2016; Wolf 2017), worsening human rights abuses (Flores-Macías and Zarkin 2021), and increasing the militarization of police and policing (Flores-Macías and Zarkin 2021). This project also contributes to burgeoning literature on organized crime expansion, including the nascent literature on mafia-style criminal organizations expanding internationally (Varese 2011) and subnationally (Moro and Villa 2017; Scognamiglio 2018; Dipoppa 2021) in Europe. This paper complements this growing literature by focusing on cartels and looking at the developing world. This study also contributes to a related set of studies exploring how positive market shocks can cause criminal organizations to expand (Sobrino 2021) and how globalization has aided organized crime diversification and expansion (Shelley 1995; Naim 2010). Finally, this paper investigates the consequences of cartels in territories outside their strongholds, which is an novel endeavor (with the notable exceptions of Scognamiglio (2018) and Dipoppa (2021), who study this topic in Italy).

1.8 Road Ahead

The dissertation continues as follows. Chapter 2 presents the theoretical framework tested in subsequent chapters. In this chapter I argue that, to the extent that a government crackdown

against the drug market creates a negative shock for drug cartels, a drug war creates strong incentives for cartels to diversify their activities to spread the risk of their investments. It then argues that if attractive business opportunities are located outside of their strongholds, they face incentives to strategically expand their operations to new territories. Finally, it presents a theory of state capture by cartels to understand how it is that within a matter of a few years, cartels were able to establish and entrench their presence in territories where they had never operated before.

Chapter 3 introduces the Mexican case, explaining why Mexico provides a good case to study. Moreover, it provides the historical context needed to understand the dynamics at play in December of 2006 when the government declared war against drug trafficking. This chapter contextualizes the situation by discussing the history of drug cartels in Mexico and the political and policy stances the Mexican government had taken against drug cartels prior to 2006.

Chapter 4 provides an in-depth discussion about the quantitative data measuring the geographic presence of cartels in Mexico at the local level created for the dissertation, including the extensive qualitative data collection efforts underlying this data. The chapter first discusses existing quantitative data and the limitations that currently exist. It then walks through the qualitative efforts taken to identify cartels in Mexico between 2000 and 2018. It finishes by describing how the quantitative data is produced.

Chapter 5 is the first empirical chapter testing the first part of the theory: cartel diversification. This chapter discusses the Mexican War on Drugs declared in December of 2006 and presents evidence that this was a shock to the drug market. It then proceeds by presenting results from a qualitative dataset identifying the activities each drug cartel diversified to and when they diversified to each activity. The evidence is clear: all drug cartels began diversifying beyond drug trafficking as a result of the government crackdown. The chapter then discusses some effects that cartel activity diversification had on cartels themselves as organizations and on the prevalence of criminality in Mexico.

Chapter 6 narrows in on perhaps the most important market that cartels diversified to

following the government crackdown: oil theft. This chapter first provides a descriptive account of how cartels entered the oil theft market and discusses why oil theft proved so attractive for cartels given the theoretical framework. It then provides quantitative evidence that cartel diversification into oil theft resulted in cartels strategically expanding their presence to territories key for oil theft—those with oil pipelines. The chapter then turns to test some of the key implications of the theory by estimating the effects of cartels entering municipalities with oil pipelines on local electoral competition and crime and violence. This chapter documents the negative consequences that cartel expansion to new territories has on local democratic accountability and citizen well-being.

Before presenting the qualitative case studies, Chapter 7 introduces a novel framework for multi-method research seeking to integrate quantitative methods for causal inference and qualitative methods for tracing mechanisms. This chapter builds on existing research seeking to bridge the quantitative-qualitative gap by thinking about how these methods can be combined in a single study. The modified potential outcomes framework presented shows how the econometric results from Chapter 6 that estimate the effects of cartels entering new territories on electoral competition and criminality can be integrated with qualitative case studies investigating *how* cartels seek state capture in new territories.

After examining the role of the evidence with respect to each other and the theory, Chapter 8 presents the case studies. This chapter first discusses the methodological processes for case selection, with special attention to how it ties in with the econometric models. It then discusses how the evidence was collected for the case studies. Finally, the chapter provides the case studies of two municipalities in central Mexico that did not have cartel presence prior to the government crackdown and subsequently saw cartels enter to steal oil. The case studies illustrate real world cases of how cartels were able to quickly build networks with local state officials to entrench their presence and operations.

To conclude, Chapter 9 revisits the main conclusions of the dissertation, highlights the

contributions it makes to our understanding of criminal organizations and their relations with the state, and discusses the broader implications of the findings for the literature and policy.

Chapter 2

A Theory of Drug Wars, Cartel Diversification and Expansion, and State Capture

In this chapter, I present a theoretical framework to understand how government policies can prompt drug cartels to diversify their activities and, as a result, geographically expand their presence beyond their historical strongholds. I then offer a theory of state capture by criminal organizations that seeks to explain how these groups are able to entrench their presence and operations in territories they had never operated but have recently entered.

2.1 From Drug Cartels to Criminal Enterprises

I begin by making the following argument that I then use to build the broader theory: Drug lords should not be thought about as the irrational, sanguinary criminals they are often portrayed as in popular culture. Instead, scholars across different disciplines argue that criminal organizations should be analyzed as strategic economic actors. More specifically, this literature contends that

these organizations are rational economic actors whose goal is to maximize profits. I go beyond the conventional wisdom by proposing that the leaders of sophisticated criminal organizations should be thought about not just as profit maximizers, but as really savvy businessmen and investors. I argue that thinking of these leaders in this manner can provide valuable new insight into the behavior of criminal organizations.

In fact, these drug lords not only have military generals and soldiers fighting for them, they also have teams of financial operators and advisors who are charged with handling key aspects of the finances for drug cartels, including investments, logistics, transactions, money laundering, and expenses, among others. In Mexico, financial operators for organizations like the Sinaloa cartel, Gulf Cartel, Zetas Cartel, and La Familia Michoacana Cartel are regularly identified and arrested. These drug cartels move so much money, that, for example, the Jalisco Nueva Generacion Cartel has an entire organization, named "Los Cuinis," dedicated to running the finances of the cartel.

These cartel leaders are therefore more like CEOs or Wall Street investment managers, making strategic decisions about how, when, where, and in what their organizations make investments in given market conditions.

To further illustrate that this is a valid way of thinking about these drug lords or cartel leaders, I provide anecdotal evidence showing that cartel leaders see themselves as investors and make decisions as such. For example, during a court hearing in New York in 2018, Jesus Reynaldo Zambada, an important leader of the Sinaloa Cartel arrested in 2008, "pointed out that when the Sinaloa Cartel buys tons of drugs... it does so with a pool of investors. The expenses, profits and risks are divided among all" (Hernández 2019, 102). He added:

> For the Sinaloa Cartel, [leaders investing together] is the way to strengthen and protect the investors' capital, and at the same time make them financially powerful... If you are investing 9 million to get a total of 45, the profit is very, very important... [but] If something is lost, divided among the investors each of them loses a small amount. (Hernández 2019, 102).

Separately, Fernando Gaxiola, lawyer for Vicente Zambada Niebla, a Sinaloa Cartel leader

arrested in 2009, explained on behalf of his client that:

> The drug trafficking game is a high-risk investment game like the stock market. If you win, you win a lot and immediately, if you lose, you don't recover until the next risky investment... [Sinaloa Cartel leaders] jointly invest for the purchase and transportation of [drugs], if the operation is successful they share the millions in profits, if not, they share the losses. (Hernández 2019, 89).

These quotes illustrate that cartel leaders think like investors, and that, as investors, they consider both the profits *and risks*—defined as the probability of losing an investment—associated with their investments. In other words, that they care about risk-adjusted returns, not just returns. They also illustrate a central part of the argument: that cartel leaders have some risk aversion in their financial decisions. Not only are they considering and incorporating risk into their decisions, they are also making decisions that purposely spread risk, for example, by investing together in a single drug shipment. That cartels consider risk and therefore care about risk-adjusted returns is a key and novel point, as the conventional wisdom is that criminal organizations simply seek to maximize profits. This is also important because even studies that examine criminal organizations as business enterprises have overlooked risk mitigation strategies. This is a subtle but important difference, as it can imply different strategic behavior, as I highlight in the following sections.

And while the accounts presented above are about investment decisions in drug trafficking, more broadly, they point to the calculus that goes into decisions about profits, risks, and investments within criminal organizations and provide credibility to the framework proposed. This theoretical contribution is at the center of the theory presented in the following sections, as it builds on this rational. It is important to note that this framework continues to assume that when criminal organizations make strategic financial decisions they seek to maximize profit, albeit while considering the risk associated with those financial decisions as well, and is therefore consistent with our existing understanding of criminal organizations as profit-maximizers.

2.1.1 Government Drug Wars and Drug Trafficking

I use the framework presented above to understand the role that government policies have on the behavior of criminal organizations. In this dissertation, I focus on criminal organizations that specialize in drug trafficking, also known as drug trafficking organizations or drug cartels, and government policies aimed at combating them.[1] Specifically, when dealing with drug cartels, governments oftentimes enact policies that their main source of revenue—the drug market—with hopes that their profits shrink and, as a result, their capacity to perpetrate crime and violence are diminished. These types of government policies are colloquially known as "Drug Wars" or "War on Drugs" and are commonplace across the world. In Latin America specifically, these types of crackdowns have become more common and increasingly involve heavy-handed militarized approaches (Flores-Macías and Zarkin 2021).

If governments decide to intensify their intervention in the drug market through a War on Drugs, then, to the extent that this crackdown disrupts the drug market, investing in drug trafficking can become a much riskier venture for drug cartels. Thus, government drug wars can increase the risk of operating in the drug market because they mean that drug cartels are more likely to lose some or all of their investment as a result of operations against drug shipments, precursor drugs, clandestine laboratories, illicit crops, traffickers, among others. This increased probability of losing some or all of a drug shipment implies that there is suddenly greater volatility in the returns to investments in drug trafficking.

2.1.2 Cartel Activity Diversification

Under low government enforcement against drug trafficking, that is, absent a government War on Drugs, drug cartels have little to no incentives to diversify their portfolios beyond drug trafficking. To the contrary, drug cartels face strong incentives to remain specialized drug

[1] While I focus on drug cartels, the argument can be generalized to any criminal organization that specializes in one activity.

traffickers because specializing in drug trafficking means investing in an activity with extremely high returns—the drug market is the most profitable illicit market in Mexico and in the world (May 2017)—and low risks given the government's laissez-faire approach to drugs. Therefore, low government enforcement against drug trafficking allows drug cartels to concentrate their portfolios and maximize profits with marginal risk.

However, in response to intensified government intervention in the drug market and the subsequent increased risk associated with investing in drug trafficking, I argue that drug cartels face strong incentives to diversify their activities. This is because in business, relying on one source of revenue when there is market volatility is a risky move. Under government drug wars, cartel leaders will recognize that if they remain specialized drug traffickers there is a high probability that they will lose their investments in drug shipments, leaving them scrambling to find a new source of revenue during already adverse times. Thus, for investors seeking to minimize this risk, diversification is a sound strategy since it reduces risk by allocating investments across various markets and industries that react differently to the same event. In other words, diversification has the aim of minimizing losses. So when cartels are facing strong government enforcement through a drug war, instead of attempting to maximize returns by investing in the most profitable activity—drug trafficking, cartels may seek to enact a defensive position by diversifying. However, by reducing risk through diversification, an investor is also accepting that they are willing to take less profit in exchange for the preservation of capital.

To illustrate, this decision entails selecting an option from the following choice set: remaining specialized drug traffickers because drug profits, in expectation, increase under government drug wars, even if there is greater volatility in those returns, or diversifying and accepting lower expected returns but reducing the volatility of those returns. Our current understanding of criminal organizations as profit-maximizing actors would indicate that cartels would select the first choice, while understanding cartel investment strategies as maximizing risk-adjusted returns would imply selecting the second option.

But what activities are cartels most likely to turn to when seeking to diversify? When diversifying, a strategy to minimize the risk of a portfolio is to look for investments whose returns are not positively correlated. For cartels, this means searching for activities whose returns are uncorrelated with the returns of their preexisting investment—drug trafficking. The intuition is straightforward: cartels should ideally find activities whose profits are unaffected by the government's actions against drug trafficking so that if there is a negative shock to their investments in drug trafficking (e.g., a drug shipment is interdicted), they will still have revenues coming in from these other activities.

While this tells us which types of activities drug cartels may seek when deciding to diversify their portfolio, it does not answer which specific activities drug cartels may enter. This is not trivial, as there are innumerable licit and illicit activities criminal organizations may potentially get involved in, and indeed are involved in around the world. Yet, given that they are specialized organizations, drug cartels, like legal firms, are constrained by their knowledge, capacity, infrastructure, local contexts, and other factors that limit their set of potential activities they may choose to enter. That is, drug cartels are not selecting from the population of all licit and illicit activities in the world. Instead, potential activities drug cartels are most likely to initially consider diversifying to are those that they have some pre-existing knowledge of or connections with. In other words, drug cartels are very unlikely to diversify to activities, in the short to medium term, that they are completely unfamiliar with or have no connections to.

The way drug cartels choose to build their efficient diversified portfolios has an important temporal implications we should observe. Generally speaking, activities cartels may diversify to can be categorized as capital intensive or non-capital intensive. Depending on which activities drug cartels choose to include in their diversified portfolios, there should be temporal patterns we observe in the rates of these activities following government crackdowns. This is because most non-capital intensive activities, such as extortion, kidnapping, drug dealing, property theft, cargo truck theft, and others, can be quickly ramped up, while capital intensive activities, including oil

theft, illegal mining, counterfeit cigarettes, fraudulent medication, illegal logging, among others, require a longer time period to fully enter and exploit. This is due to capital intensive activities requiring greater investments and acquisition of specialized knowledge, assets, technology, and trained laborers. Thus, of the activities that drug cartels choose to diversify to, non-capital intensive activities should see a rapid increase following government crackdowns as these can be quickly exploited, while capital intensive activities should show a lagged effect as drug cartels gain the knowledge and capacity to exploit these activities.

Again, note that the logic I present about cartels diversifying their activities in response to government drug wars is based on the *risks* associated with their investments in drug trafficking and not about *profit*. In fact, looking at Mexico, Castillo and Kronick (2020) theorize that government crackdowns increase the profits of drug cartels because interdiction reduces drug supply for the inelastic drug consumption market, raising drug prices for consumers, and thus increasing profits from drug sales. More broadly, Caulkins and Reuter (2010, 247) note that extreme changes is drug availability due to crackdowns against drug trafficking in different countries have been associated with temporary increases in drug prices in consumer countries in a handful of cases. If cartels were simply maximizing profits, they would benefit from crackdowns and remain specialized drug cartels since they would be making even more money by maintaining a concentrated portfolio. Interestingly then, the existing theoretical framework that understands criminal organizations as profit-maximizers cannot explain why drug cartels would diversify during crackdowns against drug trafficking *precisely* when their drug profits increase. This underscores the value of the argument that we should understand cartels and cartel leaders as sophisticated financial actors, not just profit maximizers.

Contextualizing Crackdowns and Scope Conditions

It is important to note that crackdowns can take different forms. As the theory presented here suggests, the incentives for drug cartels to diversify are driven by crackdowns increasing the

risk associated with investments in drug trafficking. The current crackdown in Mexico, as I argue in the following chapter, fits this description.

However, crackdowns that take different forms and do not increase the risks associated with illicit investments may not create the incentives proposed here. For example, other countries, like Brazil and Colombia, have at times relied on ”conditional” crackdowns that selectively focus on drug cartels that use violence against the state and are meant to reduce violence, not drug trafficking (Lessing 2017). Likewise, certain crackdowns may focus on targeting drug cartels members, usually leaders, or their finances while remaining permissive towards drug trafficking. These more limited crackdowns may not create the incentives that push drug cartels to diversify their criminal activities.

Additionally, more narrow crackdowns that target drug trafficking but do not increase risk or increase it enough may also not result in the incentives outlined here. For example, Operation Condor in Mexico spanning from the mid-1970s to the mid-1980s targeted drug cultivation but was geographically restricted to the “Golden Triangle” region between the northern states of Sinaloa, Durango, and Chihuahua. This allowed drug traffickers to simply move parts of the drug cartels structure and activities to the nearby state of Jalisco and other states where they could freely operate, and thus did not face incentives to diversify.

However, there appear to be political incentives constantly nudging politicians towards adopting unconditional crackdowns like the current one in Mexico (Lessing 2017), perhaps explaining why heavy-handed militarized approaches to combat crime and violence are becoming more common (Flores-Macías and Zarkin 2021). It is therefore important to understand the effects of these types of policies.

Moreover, while I focus on drug cartels, the theory likely applies to other specialized criminal organizations. For example, the Mexican government’s crackdown against oil theft in 2019 reportedly pushed Cartel Santa Rosa de Lima and Sangre Nueva Zetas, two powerful criminal organizations specializing in oil theft, to significantly increase their involvement in other activities

in their strongholds and nearby territories (Infobae 2019; Bhave 2019; Hernandez Estrada 2018).

2.1.3 Cartel Geographic Expansion

The decision of drug cartels to diversify as a response to government policies, I argue, has important geographic implications. This is because if cartels decide to diversify to activities that can only be fully exploited outside of their strongholds, then they face incentives to strategically expand to the territories with these new business opportunities.

First, most non-capital intensive activities, such as extortion, protection rackets, loan sharking, kidnapping for ransom, drug dealing, property theft, prostitution, and illegal gambling, among others, are not geographically constrained and can be carried out practically anywhere. Thus, if cartels choose to diversify to these activities, they can perpetrate them where they already operate and face no incentives to extend their reach outside of their strongholds.

In contrast, more profitable capital intensive activities requiring sophisticated capabilities are often geographically restricted and can only be exploited in certain places. For example, illegal mining can only be undertaken where mines are located, illegal logging is restricted to regions with an abundant source of the right species of trees, wildlife trafficking can only be perpetrated in regions where desired animals live, migrant smuggling and trafficking can only be done along migrant routes, oil theft can only be done in areas with refineries or oil transportation systems. Therefore, these may not be activities that can be undertaken or fully exploited in territories where drug cartels operate as these markets may lie outside their areas of operation.

I argue that if drug cartels want to enter and exploit these activities but they do not operate where these markets can be fully exploited, then they face strong incentives to expand beyond their strongholds in order to exploit these new business opportunities. This entails purposefully expanding their geographic presence and strategically targeting their expansion to territories where these activities exist. Therefore, if drug cartels decide to diversify to capital intensive activities that are geographically restricted to places where drug cartels do not operate, if the

expected profit is greater than the investment required to expand to that place, drug cartels face strong incentives to expand beyond their strongholds and into new territories.

2.2 Capturing the State in New Territories

Successful criminal expansion is puzzling because scholars have long believed that organized crime expansion is extremely hard and rare, which is also why most existing research studies criminal organizations in their historical strongholds.[2] First, scholars have long argued that criminal organizations depend on localized factors to protect themselves and their activities, including social embeddedness, reputation, knowledge, and ability to monitor agents and collect reliable information (Reuter 1985; Gambetta 1993). These are factors criminal organizations build over decades in their historical strongholds and often do not have in territories beyond. Moreover, a growing body of work by scholars of Latin America argues that criminal organizations cannot survive without some degree of state protection, cooperation, or collusion. For example, Arias (2017) argues that criminal organizations "must find ways to work with the state or receive protection from the state to function" (10). Durán-Martínez (2017) states that criminal organizations "depend on the direct or indirect support of state actors to survive" (37). Lastly, Trejo and Ley (2020) argue that "organized crime can only exist when criminal organizations gain some level of state protection to operate illicit markets" (38). This need for state protection explains why criminal organizations often actively seek to capture the state in their strongholds.

Yet, when criminal organizations expand to new territories where they have never operated, they often do not count with the political protection or local networks they have successfully established over decades, or centuries, in their historical strongholds. How, then, are criminal organizations able to establish their presence and operations in these new territories when they lack state protection?

[2]Notable exceptions include studies on mafias in Italy and Europe (Varese 2006, 2011; Dipoppa 2021).

Centrally, I argue that criminal organizations seek to recreate the state protection they enjoy in their strongholds in the new political jurisdictions they enter in order to establish and protect their criminal activities and profits. I contend that they accomplish this by capturing local government officials, which provides criminal organizations the freedom to operate with some degree of impunity and protects their profits by reducing state efforts to confiscate their goods and assets. In the following sections, I define state capture by organized crime and then theorize how criminal organizations undertake state capture in new territories.

2.2.1 Defining State Capture by Organized Crime

Criminal organizations are economic actors that do not seek political power or to overthrow the state (Lessing 2017), which is why they have been traditionally seen as apolitical non-state actors. However, a growing body of literature in political science and economics shows that criminal organizations are intimately tied to politics, and frequently seek to influence state behavior to protect themselves and their activities by intervening in elections and affecting electoral outcomes (De Feo and De Luca 2017; Buonanno et al. 2016; Alesina et al. 2019), capturing politicians (Dal Bó et al. 2006; Di Cataldo and Mastrorocco 2021; Trejo and Ley 2020), and influencing policy outcomes (Daniele and Dipoppa 2017; De Feo and De Luca 2017; Di Cataldo and Mastrorocco 2021).

I call this general phenomenon state capture by organized crime. Drawing on definitions of state and regulatory capture by firms (Hellman et al. 2003; Dal Bó 2006), I define state capture by organized crime as the process through which criminal organizations influence state behavior to their own advantage. It is worthwhile clarifying that state capture is related to, but differs from the concept of corruption, which is typically defined as the use of public office for private gain (Rose-Ackerman and Palifka 2016, 7-11). While some forms of state capture by organized crime can manifest themselves as corruption (for example, a criminal organization offering a bribe to a politician in return for some benefit), others do not (for example, a criminal organization

kidnapping a politician's family member to influence their behavior).

State capture by organized crime (henceforth "state capture"), is also a matter of degree, not one of presence or absence. State capture also does not imply direct control over government officials across all policy dimensions. For one, like state and regulatory capture by firms, state capture by criminal organizations seeks influence over *specific* state behaviors, not complete capture of all state functions. Moreover, even captured politicians are not perfect agents of criminal organizations, that is, agency problems remain. Rather, the degree or intensity of state capture can range from criminal organizations giving direct orders to a government official about an operation, to a government official choosing to behave slightly differently out of precaution over a public threat towards the state by a criminal organization. The degree of state capture is not static and can change across time and space. This conceptualization of state capture adds nuance to accounts of the phenomenon that use hyperbolic or sensationalist language like "narco-state" or claims that criminal organizations have "de facto control over municipal governments, peoples, and territories."

2.2.2 Strategies to Capture the State

The literature has identified various actions that criminal organizations can take to capture the state, which can be classified into two broad categories: those that rely on coercion and are meant to intimidate and those that rely on some sort of benefit and are meant to entice government officials.

First, coercive means can be used to capture the state. Works looking at this phenomenon tend to focus on direct attacks meant to kill politicians (Blume 2017; Daniele and Dipoppa 2017; Alesina et al. 2019; Trejo and Ley 2020) or police and military personnel (Lessing 2017). This is certainly the most direct and egregious form of coercion, but not the only one. Other forms of coercion can also be used to capture the state, for example, pubic threats against specific government officials, kidnapping family members, killing bodyguards, public displays of force,

and direct threats.

Second, criminal organizations can also offer benefits to government officials to capture them. The literature on mafias in Italy and prison gangs in Brazil have largely focused on voter (de)mobilization done for certain politicians (Buonanno et al. 2016; De Feo and De Luca 2017; Albarracín 2018; Dipoppa 2021; Bullock 2021). However, other common forms this phenomenon can take include criminal organizations offering direct bribes, funds to finance political campaigns, and access to certain neighborhoods during campaign cycles.

Coercion and benefits are also not mutually exclusive nor do they operate in separate spheres. Even when a criminal organization offers benefits, government officials know that coercion remains a possibility if a they steps out of line, and conversely, coercion may turn to benefits should a government official decide to give into the demands of a criminal organization. Through formal models, both Dal Bó et al. (2006) and Lessing (2017) show that these two strategies work in tandem, and may even complement each other when capturing the state.

However, when criminal organizations expand to new territories they lack many of the factors that they rely on in their strongholds to protect themselves and their business from the state. In new territories, criminal organizations lack social embeddedness, local knowledge, relations with economic elites, and the networks used to monitor agents and collect reliable information. Political elites themselves are also likely unaccustomed to dealing with or accommodating criminal organizations like the political class in organized crime strongholds. I argue that these dynamics create a context where acquiring political protection through state capture in new territories becomes indispensable, and likely of even greater importance than in their strongholds.

Due to criminal organizations lacking many of the tools they rely on in their strongholds, their choice set for capturing politicians in new territories are likely also constrained. Most notably, studies of Italian and Brazilian organized crime have highlighted that being embedded in local communities allows them to (de)mobilize voters to capture government officials through electoral incentives (Buonanno et al. 2016; De Feo and De Luca 2017; Albarracín 2018; Dipoppa

2021). However, building the capacity to monitor individual voters in order to (de)mobilize them is costly and is therefore a endeavor that is likely unfeasible in the short term. Even more, ethnographic research in Central America finds that local communities are more likely to support illicit actors native to their community and are more apprehensive towards "foreign" illicit groups (Blume 2021). Thus, criminal organizations are likely constrained in new territories to more direct approaches of capture that do not depend on being integrated with or embedded in local communities such as threatening or using violence against rival candidates, financing campaigns, providing material benefits to voters before elections, public messages aimed at voters that signal criminal organization opposition or support for specific candidates, disruptions during election days, or some related method. Which strategy is used likely depends on the criminal organization's characteristics and capabilities, government policies, and contextual conditions that shape incentives.

2.2.3 Capturing Who? Opening the Black Box of "The State"

In democracies, policymaking, including government drug wars, is in the hands of elected politicians, but the implementation of policies is delegated to and carried out by civil servants. This implies that criminal organizations have an interest in capturing not just "the state," but more specifically, different actors within the state with the power to impose costs on criminal organizations or provide benefits for them. I argue that there are, generally speaking, three types of state actors that criminal organizations are therefore interested in: (1) Politicians, (2) high-level civil servants, and (3) low-level civil servants. Figure 2.1 shows a stylized example of this structure and includes relevant agencies criminal organizations may have interests in capturing.

Capturing Politicians

Existing literature has highlighted the crucial role that politicians play in providing state protection to criminal organizations in their strongholds (Buonanno et al. 2016; De Feo and

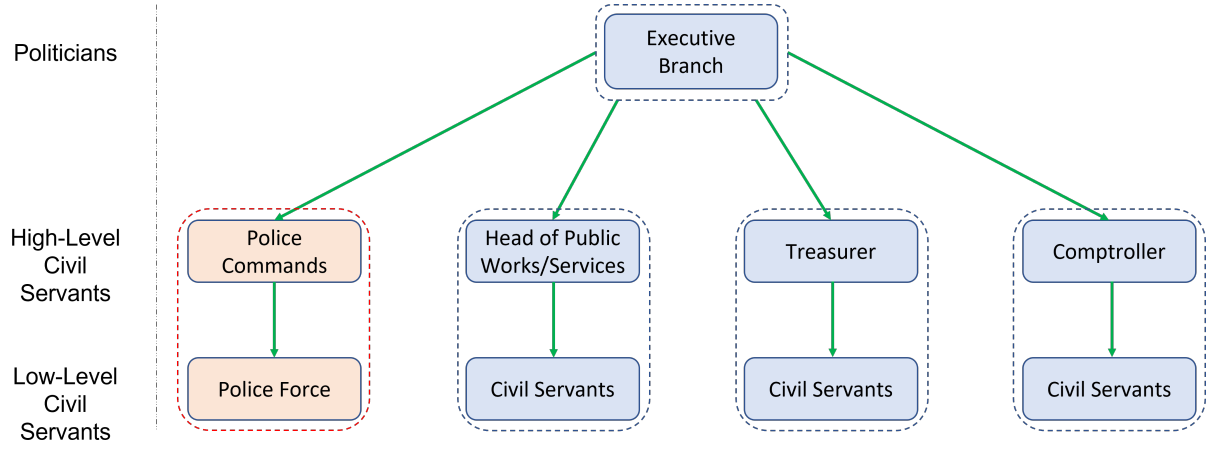


Figure 2.1: Stylized example of government structure and types of actors.

De Luca 2017; Daniele and Dipoppa 2017; Alesina et al. 2019; Albarracín 2018; Dipoppa 2021; Arias 2017; Durán-Martínez 2017; Trejo and Ley 2020). This is because capturing politicians can provide significant benefits to criminal organizations by affecting, through formal or informal channels, whether or how policies are implemented and who is implementing them. For example, depending on the context, politicians may have the power to appoint high-level civil servants such as the chief of police, treasurer, or comptroller, influence the hiring of police and prosecutors, allocate funds strategically, affect police investigations, and give insider knowledge about intelligence and operations to criminal organizations. For these reasons, criminal organizations have strong incentives to capture politicians when they are able to.

Capturing High-Level Civil Servants

While most of the existing literature focuses on links between politicians and criminal organizations, high- and low-level civil servants are often linked to criminal organizations around the world, something that has been largely overlooked by the existing literature. Here, high-level civil servants refers to non-elected government officials that occupy the top positions of government agencies. This includes both the heads of these government agencies, such as police chiefs, attorney generals, treasurers, and comptrollers, and also the people immediately below

them that have decision-making power or major influence over the policies these agencies make and implement. This would include, for example, police commanders working under the chief of police.

Yet, if criminal organizations are able to capture politicians, why capture these high-level civil servants? Part of this could be explained by principal-agent problems that politicians face when delegating policy and policy implementation. Heads of government agencies face their own incentives and constraints, that is, high-level civil servants are not perfect agents and might have their own agendas that do not include ceding policy influence to criminal organizations, not ceding it to the extent that captured politicians may want, or ceding more that the politician wants.

Moreover, high-level civil servants themselves can provide benefits to criminal organizations, some of which captured politicians might not be able to provide, even if they have influence over these high-level civil servants. For example, while a politician might have sway over the civil servant in charge of public infrastructure projects and push for certain individuals or companies to receive the contracts, by having direct influence over this civil servant, criminal organizations can get direct information about specific infrastructure projects, influence over which specific contracts to bid for, and assurances about receiving specific projects. Even more, these high-level civil servants are likely to be far more valuable to criminal organizations when they are unable to capture politicians or influence politicians to the extent they prefer.

Capturing Low-Level Civil Servants

When discussing low-level civil servants, this study focuses particularly on public security personnel, most importantly police officers, since they are the low-level civil servants that the literature has highlighted as key to criminal organizations (Arias 2006; Lessing 2017; Auyero and Sobering 2019). This begs the questions: Why do criminal organizations often choose to capture police officers and co-opt government agencies "from below"?

I argue that low-level civil servants, specifically police officers, are invaluable to criminal

organizations since they oversee day-to-day operations to establish the rule of law. Police officers are usually the most easily accessible government officials since they are out interacting with the population on a daily basis. Police officers can provide very practical short-term benefits at a relatively low cost, including transportation of illicit goods, information about government operations, protection of safe houses, and information about rival criminal organizations.

And again, individual low-level civil servants have their own goals, incentives, and constraints, which likely make them imperfect agents even if their boss is captured by criminal organizations. Even more, as pointed out, individual police officers can carry out tasks directly for criminal organizations that these groups might not be able to get even if they had captured politicians or high-level civil servants. This implies that individual police officers may offer benefits to criminal organizations that they cannot get even if they have already captured higher levels of government.

2.2.4 Capturing Who? Patterns of State Capture

A central argument is that criminal organizations seek direct influence over low *and* high-level civil servants *and* politicians if they can—not one or the other. In other words, "top-down" capture does not imply that criminal organizations will cease to deal with and capture lower-level civil servants. I argue that this is the case because principal-agent problems remain between state actors, and because police officers can offer direct benefits to criminal organizations that agency leaders cannot, high-level civil servants can offer direct benefits that politicians cannot, and elected politicians can provide benefits that civil servants cannot, even if all levels are captured.

These patterns of capture also have implications for within-government relations. First, capturing a higher-level government officials may provide downstream influences that reduce the overall costs of capture for criminal organizations. For example, if the captured candidate wins, the elected politician is likely to appoint high-ranking civil servants that are willing to negotiate with criminal organizations, making it less costly for criminal organizations to capture them.

Similarly, if criminal organizations capture a high-level civil servant, they may be able to recruit low-level civil servants that are more willing to deal with criminal organizations, making them less costly to capture.

Capturing officials in lower levels will also increase the costs and difficulties faced by those above them when trying to make or implement policy targeting criminal organizations. If lower levels of government include captured personnel, then mayors trying to make policy or police chiefs trying to conduct operations against criminal organizations will face difficulty, as those working under them can either distort policies or weaken implementation efforts directly by them not doing the job properly (or at all) or by giving criminal organizations crucial insider information.

2.2.5 State Capture and Elections

In democracies, the literature has found that election cycles play a key role in the pursuit of state capture by criminal organizations because electoral incentives are essential for politicians (Buonanno et al. 2016; De Feo and De Luca 2017; Daniele and Dipoppa 2017; Albarracín 2018; Alesina et al. 2019; Trejo and Ley 2020; Dipoppa 2021). Whether we assume politicians are policy or office-oriented, politicians seek to win elections and criminal organizations can provide their preferred candidate an electoral advantage by using coercion against rival politicians (Alesina et al. 2019; Ponce 2019; Trejo and Ley 2020), or providing electoral benefits to their preferred candidates (Buonanno et al. 2016; De Feo and De Luca 2017; Albarracín 2018). When seeking to capture politicians in new territories, criminal organizations can thus exploit election cycles by interfering in electoral processes by providing electoral benefits to their preferred politician or by using coercion against rival politicians.

Even more, election cycles are critical for capture of low- and high-level civil servants as well, because in developing countries, local politicians often have discretion over the firing and hiring of civil servants. This implies that capturing the newly elected politician may give criminal

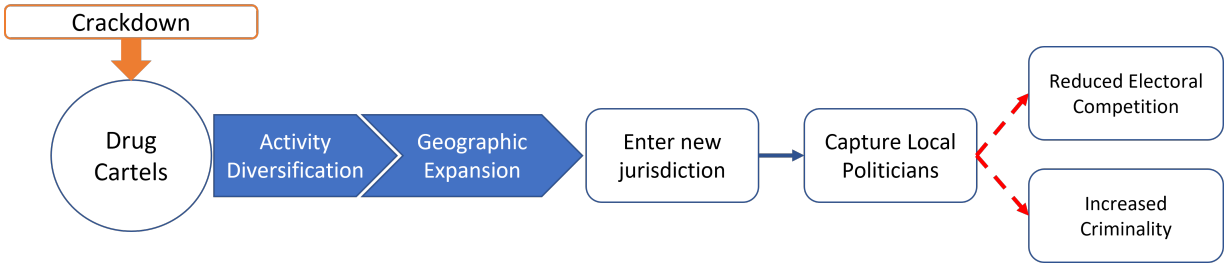


Figure 2.2: Summary of theoretical framework.

organizations influence over the appointment and hiring of civil servants, which may assure that they are individuals open to protecting criminal organizations.

2.2.6 Political and Criminal Implications of State Capture

Given the argument that to protect their activities in new territories criminal organizations seek to capture government officials and that electoral cycles provide windows of opportunities for state capture, it follows that criminal organizations negatively impact local democratic accountability. Criminal manipulation of electoral processes means that some potential politicians may be scared away from running for office or even killed, some political candidates may be scared to campaign, some politicians may receive electoral benefits from criminal organizations, and some voters may be (de)mobilized to vote or not vote a certain way.

If a criminal organization is able to capture a state official in a new territory, they are then able to establish their presence and carry out their activities with some degree of impunity and state protection. The observable implications being that criminal organizations should reduce local electoral competition and increase levels of crime and violence when entering new territories.

2.3 Observable Implications of Theory

In this section I briefly summarize and recap the theory and its observable implications that I investigate in the following chapters. The argument is visualized in Figure 2.2.

1. To the extent that government crackdowns against drug markets create a negative shock, the increased risk of investing in drug trafficking creates incentives for drug cartels to diversify their activities in order to spread the risks associated with their investments.

2. If, in the process of diversifying their activities, there are new attractive business opportunities outside of their strongholds, cartels face incentives to strategically expand to new territories where they can exploit these new activities.

3. When entering new jurisdictions, cartels seek to recreate the state protection they enjoy in their strongholds to safeguard their activities by capturing state officials.

4. In the process of acquiring state protection, cartels interfere with local elections, which reduces electoral competition.

5. State capture means cartels can perpetrate illicit activities with some degree of impunity, leading to increased crime and violence.

Additionally, narrowing down on state capture in new territories (observable implications 3-4), I expect the following, which I explore with qualitative case studies and visualize in Figure 2.3. In the figure, the blue arrows represent actions taken by cartels and black arrows represent that capturing one type of local state actor influences those above and below.

1. Cause: Cartel enters territory.

    - Mechanism 1: Cartel captures police officers.
    - Mechanism 2: Cartel captures high-level civil servants.
    - Mechanism 3: Cartel captures candidate and attempt to influence elections in their favor *or* capture elected politician.
    - Mechanism 3.5: If Mechanism 3 fails, capture high-ranking civil servants.

2. Outcome: Influence over (specific) policy and its implementation.

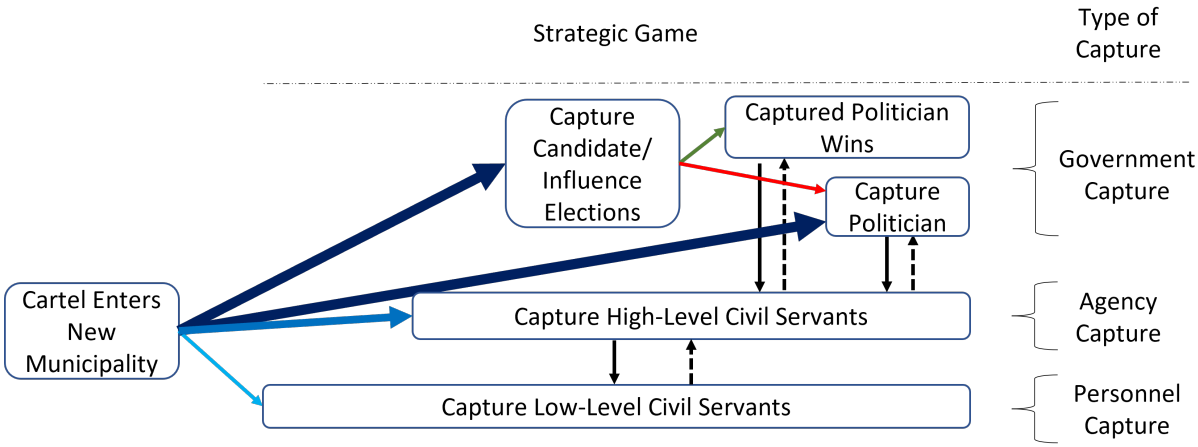


Figure 2.3: Summary of theoretical argument about state capture in new territories.

Chapter 3

Mexico, Politics, and Drug Cartels

To test the theory and its implications, I turn to Mexico. A middle income country whose criminal underworld was historically composed of a handful of large drug cartels whose primary source of income was drug trafficking. These drug cartels specialized in supplying the US market with illicit drugs, and operated in regions central for drug cultivation, production, and trafficking. In addition to having drug cartels, Mexico provides an appropriate case to study the theory proposed because the government declared war against drug trafficking in December of 2006. Before exploring the transformation of cartels following the government drug war, I first provide information on the historical context of drug cartels and politics in Mexico. This chapter outlines how drug cartels in Mexico emerged and grew through the 20th century and up to the government crackdown of December 2006, emphasizing the political context under which this happened.

3.1 Drug Cartels in Mexico

Mexico is a middle income country in Latin America. It shares 1,954 miles of land border with the United States, which is crucial for understanding the history of organized crime in Mexico. When the US imposed a prohibition on alcohol starting in 1919 with the Volstead Act, Mexican smugglers and kingship networks began to organize structures and logistics to transport

alcohol into the US. The income from this illicit business drove small scale smugglers to begin to form more complex and sophisticated networks.

In the 1920s when the US banned cocaine and opioids, including opium and heroin, and then in 1937 when it banned marijuana, many of the networks that had been established for illegally transporting alcohol from Mexico to the US began to also smuggle these illicit drugs. With the end of alcohol prohibition, many of these smuggling networks decided to continue operating as smuggling rings that specialized in trafficking illicit drugs to the US.

Even more, with heroin and marijuana, not only were Mexican networks smuggling these drugs into the US, but domestic structures began to emerge as producers and suppliers of these drugs. Due to geographic and climate conditions, certain territories in Mexico proved especially valuable for this endeavour as poppies (needed to produce heroin) and marijuana plants could be cultivated there. These cultivating regions, along with key trafficking points into the US, are where cartels emerged, for example, regions in Sinaloa, Chihuahua, Durango, Michoacan, Guerrero, Baja Califonria, and Tamaulipas (Shirk and Wallman 2015). From the 1920s to around the 1960s these smuggling networks continued operating and some began to take more sophisticated and structured forms as organizations, or "drug cartels," as they would later be called.

The 1970s were key for the evolution and growth of Mexican drug cartels for two reasons. First, while Mexico had played a small role in supplying heroin to the US, enforcement efforts in France managed to close the "French connection" that supplied significant amount of heroin to the US. Second, the US was largely successful in closing trafficking routs from Turkey as it pressured the Turkish government to crack down on opium production. This opened the door for Mexican organized crime to grow and take over the heroin market. As Shirk and Wallman (2015) note, heroin production grew sevenfold in Mexico during the 1970s as a result of these events, and Mexico became the largest heroin supplier to the US.

The 1980s also saw events unfold that helped cartels further grow in Mexico. US government efforts to curtail cocaine trafficking routes from Colombia through the Caribbean

and into South Florida pushed Colombian traffickers to seek other routes. This resulted in Colombian drug cartels initially hiring Mexican cartels as couriers for their cocaine, giving Mexican cartels access to a new and very lucrative drug market. However, due to anti-drug efforts by the Colombian government against the Medellin and Cali Cartels, Mexican cartels began to slowly gain leverage over Colombian cocaine traffickers, eventually transforming themselves from couriers that moved cocaine through Mexico and into the US to hand it off to Colombian traffickers, to traffickers that bought cocaine from Colombian producers, smuggled it into the US, and sold it at wholesale themselves to domestic US dealers.

Before the 1970s, some sophisticated trafficking networks had began to develop in territories throughout Mexico that were key for drug trafficking routes, territories known as *plazas*. With the growing role of Mexico in the illicit trade in the 1970s and 1980s, primarily as a supplier of drugs to the US consumer market, these groups began to grow and become more sophisticated and powerful. Up to the mid 1980s, these cartel leaders also operated virtually uninterrupted (Shirk and Wallman 2015; Trejo and Ley 2020). One network of drug lords known as the Guadalajara Cartel, in particular, had amassed great wealth, power, and government connections with politicians and enforcement agencies like the Federal Intelligence Agency (Dirección Federal de Seguridad [DFS]), Federal Judicial Police, and Interpol's Mexico office. The Guadalajara Cartel also oversaw alliances with important trafficking groups and acted as "large umbrella" for these other trafficking groups (Shirk and Wallman 2015, 1357). On the east coast, the Gulf Cartel had also become a powerful and influential cartel trafficking drugs through the Texas border.

The history of contemporary Mexican organized crime arguably began in 1985, when leaders of the Guadalajara Cartel kidnapped, tortured, and killed Enrique Camarena, an agent for the US Drug Enforcement Administration (DEA). The scandal and pressure from the US resulted in the Mexican government arresting the leaders of the Guadalajara Cartel, who had previously operated undisturbed due to government protection. Academic and journalistic investigations provide different versions of why and how this occurred, but they agree that following the arrest

of these leaders, the umbrella Guadalajara Cartel broke up into three major cartels: the Sinaloa Cartel, Juarez Cartel, and Tijuana Cartel.

By the 1990s, the main drug cartels operating in Mexico were the Sinaloa Cartel, Juarez Cartel, Tijuana Cartel, and Gulf Cartel, with an additional powerful but less known cartel also operating, Milenio Cartel. Around 2000, a cartel named La Empresa (later renamed La Familia Michoacana) also emerged when it broke from the Milenio Cartel. These large drug cartels largely controlled the drug trade in Mexico from the 1990s on without much government intervention until the government declared war against drug trafficking in December of 2006.

3.2 Political Context

The political context under which drug cartels in Mexico emerged, consolidated, and amassed power is crucial to understand. From 1929 to 2000, Mexico was ruled by a single party, the Institutional Revolutionary Party (Partido Revoucionario Institucional [PRI]), under an authoritarian system. Under the PRI, power was highly centralized despite Mexico being a federal system since they controlled virtually every elected position and government agency.

A key factor that facilitated the growth of drug cartels during this period that has been highlighted by scholars, experts, and investigative journalists alike, was the complicity of the state apparatus in protecting drug traffickers and their operations (Astorga Almanza 2005; Flores Pérez 2009; Hernández 2012; Castellanos 2013; Shirk and Wallman 2015). During this time, rather than drug cartels capturing state officials to obtain state protection, however, the state apparatus was itself the one protecting drug traffickers in return for financial benefits (Astorga Almanza 2005; Snyder and Duran-Martinez 2009; Flores Pérez 2009; Shirk and Wallman 2015). The literature agrees that during this period the power dynamic was one wherein the state had clear control over drug cartels (Astorga Almanza 2005; Snyder and Duran-Martinez 2009; Flores Pérez 2009; Shirk and Wallman 2015). As Shirk and Wallman (2015) state:

> [T]here is substantial evidence that the evolution of trafficking networks in Mexico benefited from protection by high-level government officials. Single-party rule meant that well-placed bribes at the highest levels guaranteed a "trickle down" effect of government protection and made it possible for criminal organizations, each assigned to its own [region], to operate unmolested by competition. The traffickers, in turn, delivered a fee to their government protectors. (Shirk and Wallman 2015, 1360).

During this collusive period, enforcement efforts against drug cartels was rare and selective, allowing drug cartels to operate with impunity. The only major anti-drug operation occurred between 1975 and 1983, when the federal government implemented Operation Condor as a result of increasing US pressure to counter drug trafficking. The goal of Operation Condor was to target drug cultivation but was geographically restricted to the "Golden Triangle" region between the northern states of Sinaloa, Durango, and Chihuahua. This allowed drug traffickers to simply move parts of the drug cartel structure and activities to the nearby state of Jalisco and other states where they could freely operate. Moreover, drug traffickers themselves remained free and were not systematically targeted by this operation. In fact, some accounts claim that Miguel Àngel Félix Gallardo, a main leader of the Guadalajara Cartel, had an office in downtown Guadalajara where people could visit and ask for help or favors.

Even more, some historians have also documented that rather than the state using this operation to target drug traffickers, the enforcers of this policy, the DFS, took it as an opportunity to further exert their control over the drug trafficking industry and regulate it to their benefit (Cedillo 2019). It was precisely under the DFS that the powerful Guadalajara Cartel and the Gulf Cartel rose to prominence.

Another key event was the assassination of a DEA agent by the Guadalajara Cartel in 1985. Pressure from the US in response to this event drove the Mexican government to arrest the leaders of the Guadalajara Cartel, which had been protected until then. The drug industry, however, was not attacked. Instead, new arrangements emerged that gave rise to the Tijuana Cartel, Juarez Cartel, and the Sinaloa Cartel. Under the PRI, the same collusive relationship continued to exist with these cartels through the 1990s. As Trejo and Ley (2020) underscore, while

top-down government crackdowns against drug cartels had occurred intermittently throughout the 1970s and 1980s, by the 1990s the Mexican government was no longer pursuing heavy anti-drug enforcement and was instead in a low enforcement equilibrium.

Starting in the late 1980s and 1990s, Mexico began to experience bottom-up democratization through party alternation at the local and state levels. This process culminated in 2000 with the election of a president from an opposition party, the right of center National Action Party (Partido Acción Nacional [PAN]). This democratization process had important repercussions on drug cartels. Scholars have argued that the gradual erosion of the PRI regime during the 1990s, particularly due to party alternation at the state level, severed certain protection pacts that drug cartels had established with the PRI, leaving some cartels vulnerable when a new party took office (Astorga Almanza and Shirk 2010; Ríos 2015; Trejo and Ley 2016, 2020). This drove drug cartels to begin fighting each other over key drug trafficking corridors since the PRI could not regulate all territories anymore, increasing cartel-related violence (Astorga Almanza and Shirk 2010; Trejo and Ley 2016, 2020).

Chapter 4

Measuring Organized Crime

As violent crime has increased in many parts of Latin America, a large body of research has focused on studying one of its major drivers: criminal organizations, from street gangs to transnational drug trafficking organizations. However, empirical studies of organized crime, especially those using large-sample statistical analysis, have been limited by a dearth of systematic, high-quality, and publicly available data on key attributes of violent criminal organizations, in particular, where they operate geographically across time. This has constrained our ability to answer important questions about criminal organizations.

Data collection efforts in the past decade have closed part of the gap and shown the way forward for those seeking to create transparent, systematic, and publicly available datasets. For Mexico, some researchers have created subnational or state level cross-section or panel data of cartel presence based on systematic "manual" coding of newspapers and other sources (Signoret et al. 2021a; Phillips 2015; Alcocer 2023b; Pérez Dávila 2022; Sánchez Valdés 2015, 2017; Saucedo 2019, 2022), while others have developed automated processes to analyze large amounts of text documents (mostly newspaper articles) to count events and identify cartel presence (Coscia and Rios 2012; Osorio 2015). However, no country-wide systematic data past 2010 exists outside of partial snapshots without much transparency behind the data or methods.

Table 4.1: Existing systematic publicly available datasets on cartel presence in Mexico.

		Method	
		Manual	Automated
Coverage	National	Signoret et al. (2022): state panel, 2007-2015. Phillips (2015): state panel, 2006-2012.	Coscia and Rios (2012): municipal panel, 1990-2010. Osorio (2015): municipal panel, 2000-2010.
	Subnational	Alcocer (2023): municipal panel, Guanajuato 2000-2022. Pérez Dávila (2022): municipal panel, San Luis Potosí 2013-2019. Victor Sánchez (2015): municipal cross-section, Guerrero 2015. Victor Sánchez (2017): municipal cross-section, State of Mexico 2014-2017. Saucedo (2019,2022): municipal cross-section, Guanajuato 2019, 2022	

In this chapter, I introduce a novel dataset on cartel presence in Mexico that tracks the geographic presence of cartels at the municipality-year level from 2000 to 2018. To create this data, I co-founded the Mapping Criminal Organizations (MCO) project with Patrick Signoret in 2018, later recruiting Fernanda Sobrino and Cecilia Farfán-Méndez. The data presented in this chapter was created in collaboration by the MCO team.

4.1 Existing Data in Mexico

Most generally, data on the geographic presence of cartels in Mexico can be categorized according to its geographic and temporal scope and whether it was created manually or through automated methods. Table 4.1 includes existing datasets according to this categorization.

First, some researchers have created subnational panels or cross sections of cartel presence based on systematic "manual" coding of newspapers and other sources. For example, Sánchez Valdés (2015, 2017) has published static snapshots for some years of municipal-level criminal organization presence in the state of Guerrero in 2015 and the State of Mexico between 2014 and 2017. Saucedo (2019, 2022) has published snapshots of cartel presence and their wars in the state of Guanajuato in 2019 and 2022. Others have created national datasets aggregated at the state level. For example, Phillips (2015) coded the presence of major drug cartels aggregated to the state level from 2006–2012. In more detail, Alcocer (2023b) and Pérez Dávila (2022) create panel datasets of cartel presence in the states of Guanajuato between 2000 and 2022 and San Luis Potosi between 2014 and 2019, respectively. These authors also provide qualitative

information on the cartels in the datasets. However, these datasets are either temporal snapshots that are geographically limited or aggregated to the state level, missing either temporal or local dynamics.

Meanwhile, others have developed automated processes to analyze large amounts of text documents (mostly newspaper articles) to count events and identify cartel presence. For example, Coscia and Rios (2012) produced municipality-year data for 1990–2010 by scrapping online news articles and using cartel-municipality word pairings to measure where cartels operated across time. Similarly, Osorio (2015) produced a weekly dataset of events of cartel-related violence at the municipal level for 2000–2010, from which he produced maps of cartel presence, by using event data collection methods. However, these two data present two limitations for the study of contemporary organized crime in Mexico: (1) the data only cover up to 2010, and, relatedly, (2) they only measure a subset of the criminal organizations that operate in Mexico—a phenomenon that becomes very prominent starting in 2010 when mass cartel fragmentation begins.

4.2 Overview of the Mapping Criminal Organizations Project

To overcome the existing data gap, the MCO project seeks to create comprehensive data on criminal organizations in Mexico. To accomplish this, we establish an integrated data collection process that relies on both qualitative and quantitative methods. Figure 4.1 provides a visual outline of this process, including how all parts of the broader MCO project are integrated. The following sections present each portion of the data collection process in detail, but here I introduce an overview of the process.

Fundamentally, we believe that integrating qualitative and quantitative data collection methods provides the most credible and robust data outputs as they complement each other. On the one hand, manual coding benefits from human intelligence to properly read the source documents and understand nuances and references to other events, but is labor intensive and

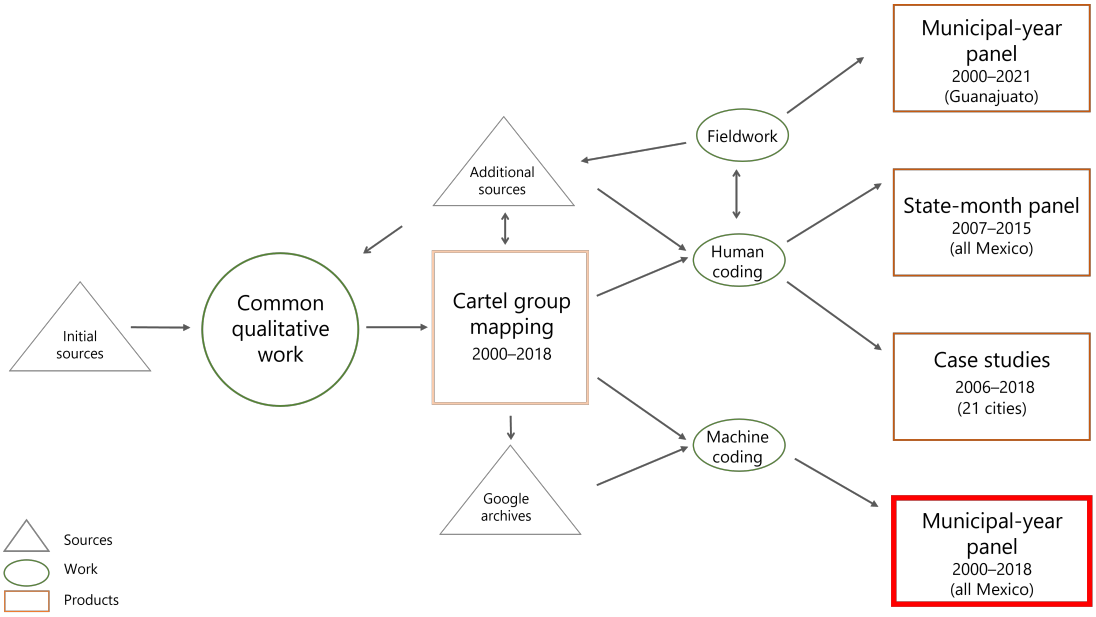


Figure 4.1: Mapping Criminal Organizations in Mexico, project overview. Red box shows key data used in this dissertation.

susceptible to arbitrariness and lack of transparency, especially if carried out by a single individual. Automated coding can more quickly analyze raw text to produce systematic and updated data, but requires previous labor to find and prepare raw data and produce dictionaries, definitions, and training and validation datasets. Both approaches face additional common challenges, of which I highlight two. First, researchers necessarily need to make crucial decisions such as how to define and distinguish criminal organizations and what constitutes their "presence" in a territory; these criteria vary across researchers and have so far remained largely private. Second, existing work has relied on newspaper articles as the main source of information, which can lead to biased coverage, especially on the topic of interest. In short, a detailed, complete, and updated mapping of criminal organization presence is needed and would benefit most from a mix of qualitative and quantitative approaches. We have designed the MCO project around this philosophy.

At the center is a fundamental question which other works have not addressed, and that is, which cartels operate in Mexico and when have they operated. This simple question is not straightforward, as the handful of drug cartels that existed in Mexico since the 1980s

began to fragment around 2010, with dozens of powerful cartels now operating in the country. Moreover, some cartels have or are referred to with multiple names, and even more, some cartels have subgroups that also have names and are sometimes discussed as if they were cartels when they are not. The closes data source on this is Guerrero-Gutiérrez (2011), who tracks the main fragmentation of each large drug cartel. Nevertheless, the sources, coding decisions, and details about the list this author provides are not transparent nor publicly available. Therefore, before mapping the geographic presence of cartels in Mexico, it was necessary to create a list of all cartels that operated in the country at any point between January 2000 and December 2018, a dataset we call "Cartel group mapping." In other words, before seeking to answer where cartels operate, we ask which cartels we should be looking for in the first place. Creating this qualitative dataset has been an iterative process that initially entailed collecting all existing lists of cartels between 2007 and 2015, investigating each cartel mentioned, identifying whether they operated independently at any point, if so when, and what the cartel was called, among other information. This list was then complemented with extensive qualitative research and extended to cover 2000 to 2018.

Using this list of cartels, their names, and the dates they operated independently, we then seek to understand where they operate and create different datasets of geographic presence. First, using this list and additional qualitative research, we create manually-coded datasets on the geographic presence of each cartel at the (1) state-month level for all Mexico between January 2007 and December 2015 (Signoret et al. 2021a), (2) municipality-year level in the state of Guanajuato (Alcocer 2023b), and (3) municipality level case studies for 21 metropolitan areas (Signoret et al. 2021b). This qualitative endeavour generated unique insights and valuable knowledge that simply processing text through machine learning would not. For example, we gained knowledge about what a cartel being "present" in a territory means in the Mexican context, how to think about that presence, how different sources (news, government, expert, and other sources) talk about the phenomenon and refer to cartels, and what type of information is most

commonly disseminated by public outlets, among others. This proved invaluable for then creating the automated dataset.

Finally, most relevant for this dissertation, we created a municipality-year level measure of cartel presence covering all of Mexico from 2000-2018 (Sobrino et al. 2022). Given the importance of this dataset to this dissertation, in the following sections I discuss the following in detail: (1) cartel group mapping and (2) cartel geographic mapping.

4.3 Mapping Cartels in Mexico

Before trying to identify where cartels operate geographically during a given period of time, we must know which cartels we are looking for. This is not a straightforward task, as it brings up three key issues: (1) cartels that use or are referred to by different names but are one cartel, (2) cells that operate for a cartel that are sometimes referred to as a cartel themselves because they have a name, and (3) identifying when cartels began and, if applicable, ended operating independently. These three challenges are crucial because not considering them may result in an inflated number of cartels, double counting, and inaccurate information.

For example, organizations like the Crisis Group report that between 2009 and 2019, 463 criminal groups operated in Mexico, which is more than double the number reported by reputable local media during the same period (Esberg 2021). This is likely because they identify cartels "based on whether [they] operated under a unique name, a signal that [they were] working at least semi-independently" (Esberg 2021), an assumption our qualitative research disagrees with. Similarly, the Armed Conflict Location & Event Data Project (ACLED) also takes this approach. To highlight the issue, in our investigation, we identified 290 "cartels" operating in Mexico between 2006 and 2016 from our main sources (see section below), but after extensive qualitative research, we found that many of those referred to the same cartel or to some faction or cell within a cartel, not to different cartels. After accounting for this, we concluded that only 38

unique autonomous cartels operated within this time period.

To illustrate the challenge, I provide examples of the issue here. First, cartels often have or are referred to by different names. The Tijuana Cartel, for example, has been referred to as "Cártel de Tijuana," "Cártel de los Arellano Félix," and "Organización de los Arellano Félix," just like the Beltrán Leyva Cartel has been called "Cártel de los Beltrán Leyva," "Organización de los Beltrán Leyva," and "Cártel del Pacífico Sur." Knowing that these are all referring to the same cartel is important to not count the same group separately or multiple times. Second, Mexican cartels often have internal "groups" that have or are referred to by specific names. However, these "factions" or "cells" operate for and answer to the leaders of a cartel—they are not independent cartels. For example, the Sinaloa Cartel has various internal cells that are named: Los Antrax, Los MZ, Los Chapitos, and Gente Nueva, among others. Without qualitative research, we would fail to consider that they are all part of the same cartel and that all of these internal groups answer to the Sinaloa Cartel leaders. If we did not investigate each group qualitatively and uncover that they are all part of the Sinaloa Cartel, we would count each one as a separate cartel because they are a named criminal group. This would result in us over-counting the number of cartels operating in Mexico and, if they operate in the same territories as other Sinaloa Cartel factions, double count the number of cartels operating in a territory. Finally, some cartels during this period fragment and cease to operate as a coherent organization but sources sometimes continue to call the fragments that continue operating by the name of the defunct cartel. For example, despite the Gulf Cartel fragmenting into different cartels in 2013, many media outlets continued to regularly call the successor cartels the "Gulf Cartel" even though they were referring to groups like Los Metros, Los Rojos, and Los Ciclones, among others. Not accounting for this would lead us to continue to measure Gulf Cartel presence past 2013 when they no longer operated. These are important issues to consider, and issues that can only be identified and resolved through extensive *qualitative* research.

In sum, in contrast to some existing data efforts, we decide to track cartels that operate

independently. This requires us to identify which cartels were independent and when, as well as which were not independent and who they operated for. From this list we then use automated methods to scrape online sources and create a data of cartel geographic presence.

4.3.1 Cartel Group Mapping

To create the list of cartels operating in Mexico between 2000 and 2018 we undertook three steps: (1) identifying, combining, and processing information from government and expert sources with a nationwide scope to create a list of all "cartels" mentioned in these sources between 2006 and 2016, (2) researching each "cartel" on the preliminary list to generate a qualitative dataset identifying all independent cartels, their different names, and factions, and (3) conducting extensive qualitative research into each cartel to extend the period covered to 2000-2018 and include key information for each cartel.

First, we hand-coded data found in over 60 documents from 11 sources, including Mexican and U.S. government agencies, specialized sources, and experts. We selected our sources carefully to set a uniform standard for inclusion of cartels and minimize sources of bias. Then we extracted all of the relevant data points from those documents, including the names of the groups, factions, or cells involved; the territory in which they were reported to be present; how that presence was characterized (activities, level of influence in illegal markets, etc.); and the relevant period.

Specifically, we sought to process all documents (reports, articles, maps, tables, charts) from official and expert sources that provided systematic information on the presence of cartels in Mexico from 2006 to 2016. By "systematic" we mean that the documents provided information on criminal group presence for all groups (of some type) and for the entire country. For example, we did not code documents that focused on a single group or region. We did this for two reasons. First, to constrain the scope of this first output of the Mapping Criminal Organizations project, providing an initial reference dataset while working toward more exhaustive future mapping. Second, for balance: to ensure that variation in identified group presence was not caused by

differences in data collection efforts across territories or groups.

We collected documents from two types of sources: U.S. and Mexican government agencies and non-government specialists or news media. There were 11 sources in total, from which we collected over 60 documents. From the Mexican government, we processed all reports listing drug trafficking groups and their presence at the state level shared by the Attorney General's Office (PGR) and the Federal Police in response to freedom of information requests. To track them down, we carried out systematic searches of responses to information requests on the relevant portal. There were eight unique reports from 2007 to 2015, though some were delivered multiple times by the PGR (and sometimes incorrectly reported by the press as new or updated information). Additionally, we processed a report published by the security cabinet and two reports that cited federal government sources.

From the U.S. government, we collected all of the Drug Enforcement Administration's Drug Threat Assessment Summary reports; all press charts referring to Mexican cartels published several times per year by the Treasury's Office of Foreign Assets Control; all quasi-annual Congressional Research Service reports on Mexico's drug trafficking organizations; and a few internal Department of Homeland Security or Department of Justice reports that we found through searches of public intelligence.net and wikileaks.org. The expert and news sources we consulted synthesized official and open source reports to provide snapshots of Mexican cartel presence at the national level. They included all of Stratfor's quarterly and annual Mexican drug cartel updates, two surveys from organized crime expert Eduardo Guerrero Gutierrez, and one investigative news article with a national overview based on government sources and its own archives.

We identified several other maps and reports that provided comprehensive lists of cartels and their areas of operations over our period of interest but contained no original data, as they simply compiled or replicated the unique sources that we had already processed. Our background research also found that some sources appeared to be more reliable than others, so we did not place equal weight on all of them.

Second, we carried out supporting research to identify unique cartels and track their composition and evolution through time. This was necessary to organize the "raw" data extracted from our sources, which included 290 unique group names, many of which referred to the same core cartel, factions of a larger cartel, or a conglomeration of independent cartels. Transforming the "raw" data points into clean list of cartels required extensive supporting research. Our raw set of 2006–2016 data points produced 290 unique combinations of cartel and faction names. Some cartel names were coded in periods in which they were factions of a larger cartel; conversely, some cartels were reported as factions of another but were actually no longer affiliated to that cartel (often because the broader cartel was no longer a single cohesive organization). Some cartels changed names. We therefore carried out what we call "group mapping" (as opposed to "territorial mapping"): investigating the origin, evolution, and affiliation of cartels or factions to produce a unique set of named cartels and establish when cartels and factions were independent rather than part of another group. Using the raw dataset as an initial reference, we drew on a variety of resources including news archives, investigative magazines, websites and blogs focusing on Mexican cartels, interviews with experts, and our own field work. All decisions and references are documented. We ended up recognizing and providing stable names to 38 groups that we deemed autonomous at some point between 2007 and 2015.

Third, having an extensive qualitative data collection process was undertaken to expand the time covered and further identify new cartels. This is especially relevant because important cartel fragmentation continued past 2015. This process involved collecting updated government and expert reports on the cartels operating in Mexico, researching each new cartel found in these reports, and also researching each cartel in the original list with systematic online searches past 2015 to identify whether they still operated and whether they had experienced fragmentation. This resulted in new independent cartels being identified. For each new independent cartel, we collected the same information we collected for all cartels, including when they began and (if applicable) ended operating independently, what cartel they fragmented from, and what names

they have used or been called, among others. The final product is a list containing the population of cartels operating in Mexico between January 2000 and December 2018.

Figure 4.2 shows the cartels identified and visualizes their fragmentation and time period of operation. It also shows which are the drug cartels this dissertation focuses on (see following section for more on this).

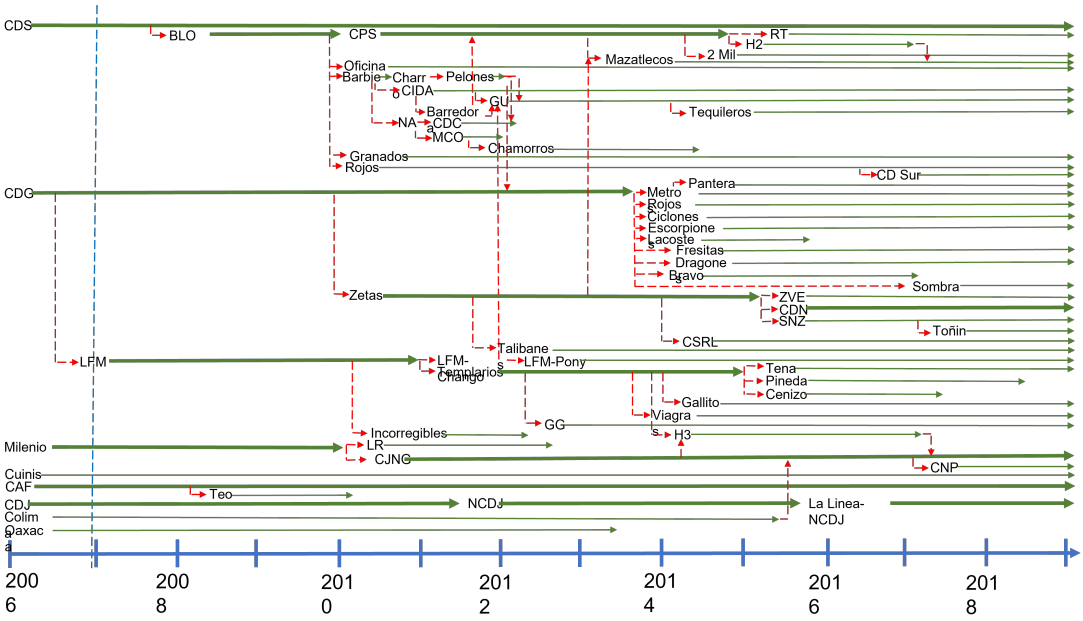


Figure 4.2: Cartel fragmentation, January 2006 to December 2018. Green arrows represent period cartel was active. Thicker green arrows are drug cartels this dissertation focuses on. Dotted horizontal line denotes the beginning of the government War on Drugs.

4.3.2 Examples of Cartel Group Mapping

To illustrate the output created by this data collection effort, I provide examples of two cartels that that we track, the Gulf Cartel and the Beltrán Leyva Organization.

Example 1: Gulf Cartel

The Gulf Cartel has been operating for a century out of the northern state of Tamaulipas. In the late 1990s, the Gulf Cartel created a group of enforcers called Los Zetas. After 2003, when top boss Osiel Cárdenas Guillén was arrested, and especially after 2007, when he was extradited

to the United States, the Zetas grew increasingly strong and autonomous. From 2007 to 2009, some sources referred to the joint organization as "Golfo-Zetas" or "La Compañia" rather than just "Golfo", and others considered the Gulf and Zetas groups independent—and increasingly tense—allies. By January 2010, they were outright enemies, never to reunite under one boss again. We decided to consider the Gulf Cartel to be "whole" through 2009, still considering Zetas a faction and conceiving of any conflict between Golfo and Zetas in this period as internal rather than inter-group. Starting in 2010, we code them separately. Our pre-2010 decision owed largely to a key practical consideration: few sources distinguished between Golfo and Zetas presence.

Over the following three years, the Gulf Cartel came under severe strain from its war against the Zetas and by repeated arrests or deaths of its leaders, and internal tensions again reached a breaking point. We consider Mario Ramírez ("X-20" or "El Pelón") to be the last individual that had any plausible claim as boss of all Gulf Cartel factions. After his arrest in August 2013, various factions continued to claim the Gulf Cartel mantle and to use its name—and various sources to this day continue to refer to "the Gulf Cartel" as a single group. We, instead, consider the Gulf Cartel to be extinct since September 2013, split up into various independent successor groups.

Following the breakup of the Gulf Cartel, sources mention various successor groups. We determine the following cartels as successors of the Gulf Cartel and track each under their new names: Los Metros, Los Rojos, Los Ciclones, Los Fresitas, Los Dragones, Los Escorpiones, Grupo Bravo, Grupo Pantera, Grupo Lacoste, and Grupo Sombra.

Example 2: Beltrán Leyva Organization

The Beltran Leyva brothers had been operating under the Sinaloa Cartel for decades. Before 2008, the Beltran Leyva brothers were so closely associated with Joaquín Guzmán ("El Chapo") and Ismael Zambada ("El Mayo") that the entire conglomerate was considered one organization (called the Sinaloa Cartel or the Pacific Cartel, among other names). Internal problems led the Beltrán Leyva Organization to split off violently—we consider it to be an

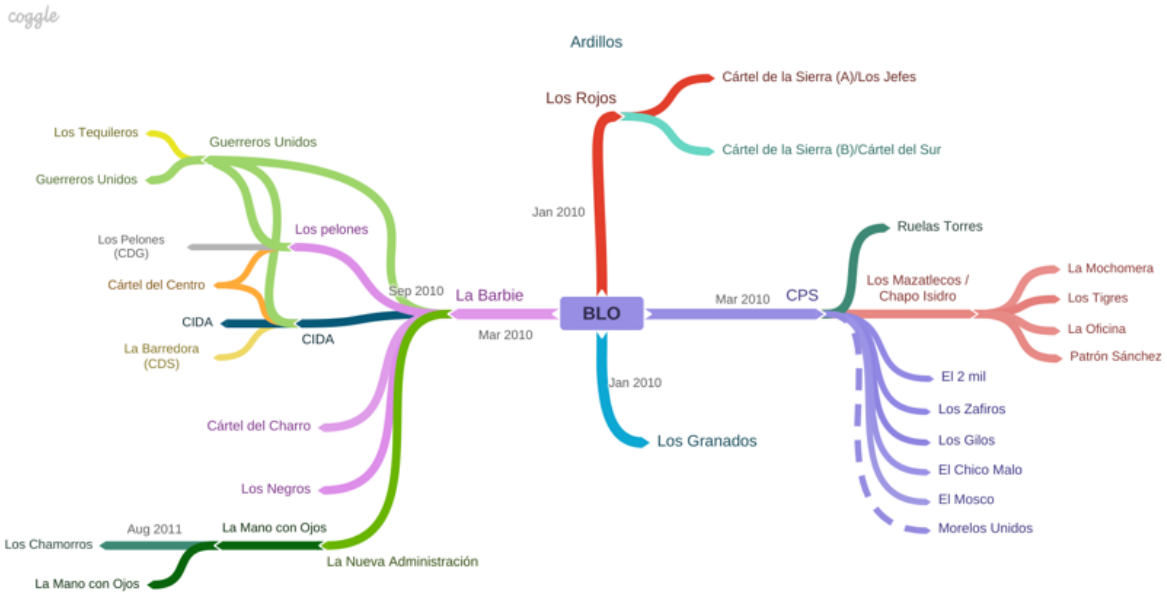


Figure 4.3: Fragmentation of the Beltrán Leyva Organization.

autonomous group starting in February 2008. After the Mexican Navy killed top boss Arturo Beltrán Leyva in December 2009, the group began to disintegrate. We consider the "core" group to have continued operating under Arturo's brother, Héctor Beltrán Leyva, under the name "Cartel del Pacífico Sur," and then to have survived (and continued to be often referred to as Beltrán Leyva Organization) as a conglomeration of Los Mazatlecos, the Patron Sanchez ("H2") family, and enterprises linked to Fausto Isidro Meza Flores ("El Chapo Isidro"), all of which we combine under the abbreviated name "Mazatlecos-Meza-Flores".

Meanwhile, former factions of the Beltrán Leyva Organization went off on their own, and some split into even more factions. Figure 4.3 summarizes our understanding of the Beltrán Leyva Organization's evolution after 2009.

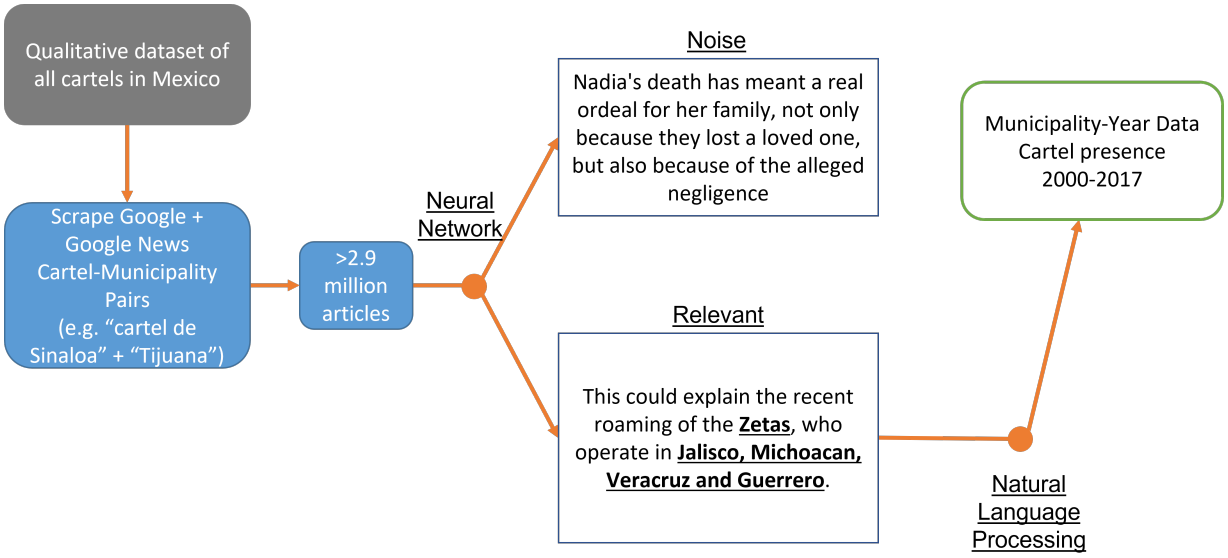


Figure 4.4: Data collection process for mapping cartel geographic presence.

4.4 Mapping Cartel Geographic Presence

Having identified *which* cartels operated in Mexico between January 2000 and December 2018, we then used this data to create a quantitative dataset measuring *where* these cartels operated at the municipal level each year. To do this, we rely on the list of cartels and the different names these cartels are referred to by government, expert, and media reports, Google and Google News, and machine learning. An overview of the data collection process is shown in Figure 4.4.

The algorithm to create this dataset is the following. First, a web crawler is used to scrape Google and Google News Mexico. Google News is a news aggregator that watches more than 50,000 news sources worldwide. Google does not provide the number of sites it tracks for the Mexican version but through the scrape we identified 770 local, 33 national, and 83 international media outlets that report in Spanish. This web crawler looked for any articles between 1990 and 2018 that contained a municipality-cartel pair (e.g., "Cartel de Sinaloa" + "Irapuato").

The web crawler collected every article whose main body mentions: i) a Mexican municipality and ii) the name of a cartel in Mexico. The number of articles found by the crawler are over 2.9 million. We used a sentence extractor to keep the sentences from this articles that

included a municipality-cartel pair. If the article contained a year I assign the event to that year, if no year was assigned I use the publication year. The number of sentences that we analyzed are over 6 million.

Next, to remove irrelevant data, we manually classify 5,000 sentences as having potentially relevant information or not. We then use this to train a semisupervised convolutional neural network (CNN) to remove noise from the data. From the remaining data, we manually classified 5,000 sentences as either talking about cartel presence or not to train a semisupervised CNN. We use 80% of this sample as the training set and 20% as the test set. A CNN is a deep learning set of algorithms usually used for image classification but had proven effective in text classification (Kim 2014; Young et al. 2017). The CNN works as follows. Sentences are first broken into words, then transformed into a word embedding matrix. Then several filters are applied that constitute of different word window sizes that go over each sentence. This is followed by a discretization operations that reduce dimensionality of the output. This produces the final sentence representation that is classified. The particular CNN used here has an out of sample classification accuracy of 0.86.

The final output is a municipality-year-cartel dataset that measures which municipality each cartel operated in from 2000 to 2018.

4.4.1 Validating Data

Given that the automated municipality-year dataset is created using semi-supervised machine learning, we want to validate the data to assure we are measuring what we want to capture. To validate our municipality-year data we rely primarily on manually coded datasets. We do this because we have confidence that the manually coded datasets are capturing the phenomenon relatively accurately since they were created by experts who read, interpreted, and processed the information.

First, we aggregate our municipality-year data to the state level and compare it to the

state-month dataset we, MCO, created through manual coding (see Figure 4.1). We also use the municipal snapshots of specific states created by Sánchez Valdés (2015, 2017), the municipal panel data on cartel presence in the state of Guanajuato (Alcocer 2023b), and the Coscia and Rios (2012) municipal panel dataset that goes up to 2010. Depending on the cartel and dataset, our correlations range from 0.5 to 1. And while the datasets we use for validation only partially overlap with our municipality-year data, either temporally or geographically, they cover different cartels and states, which builds confidence that our automated municipality-year data is capturing what we want.

4.5 Drug Cartels and Scope of Research

The process described here tracks the geographic presence of dozens of cartels in Mexico. However, the argument presented in Chapter 2 is specifically about drug cartels. Given that cartel fragmentation took off in 2010, three years after the government drug war and after the major drug cartels had already diversified (see next chapter), many of the new cartels cannot be analyzed using the theoretical framework presented in this dissertation. Especially since many of the cartels that emerged were not specialized drug traffickers. For these reasons, I focus on the major drug cartels in Mexico that operated before the crackdown and that specialized in drug trafficking before the government drug war of 2007. Therefore, for the data and analyzes in the following chapters, I focus specifically on the following drug cartels:

- Cartel de Sinaloa (Sinaloa Cartel)
  - Organizacion de los Beltran Leyva (Beltran Leyva Organization)
- Cartel del Golfo (Gulf Cartel)
  - Cartel del Noreste (Northeast Carel)
  - Cartel de los Zetas (Zetas Cartel)

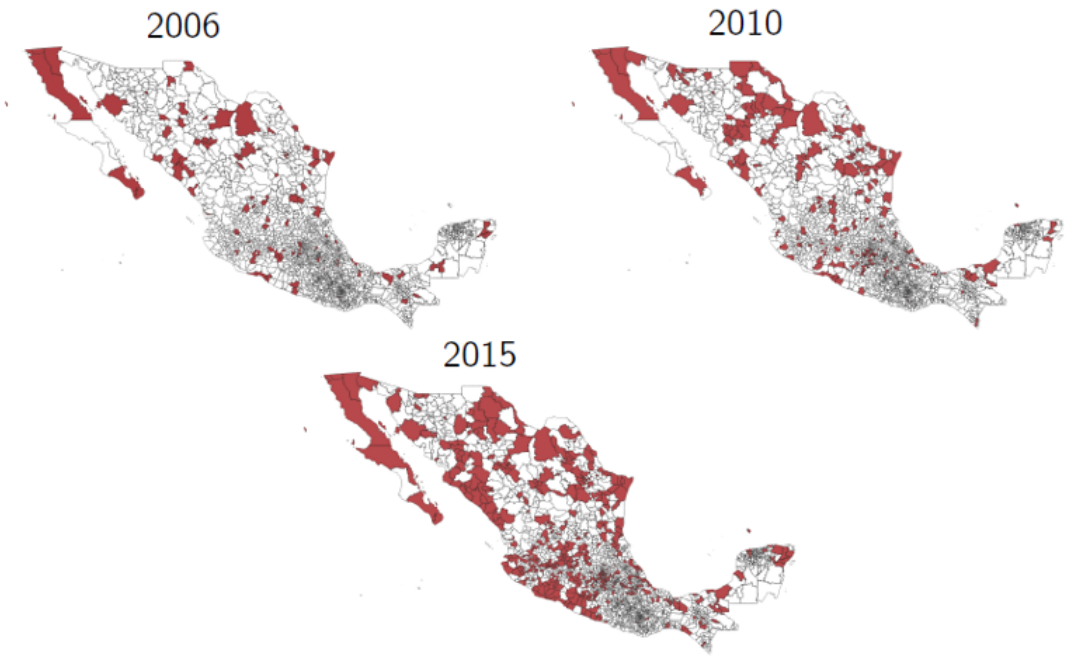


Figure 4.5: Drug cartel presence. Snapshots of 2006, 2010 and 2015.

- Cartel de Juarez (Juarez Cartel)
- Cartel de Tijuana/Organizacion de los Arellano Felix (Tijuana Cartel)
- Cartel del Milenio (Milenio Cartel)
  - Cartel Jalisco Nueva Generacion (Jalisco New Generation Cartel)
- La Familia Michoacana (Michoacana Family Cartel)
  - Los Caballeros Templarios (Knights Templar Cartel)

Figure 4.5 visualizes the geographic presence of these cartels in 2005, 2010, and 2015.

While not visualized here, I also use the geographic presence of 28 small cartels as a control in the section examining the political and criminal consequences of cartel expansion. These smaller, yet powerful cartels include: CIDA, Cartel Nueva Plaza, Cartel Santa Rosa de Lima, Mazatlecos, La Barbie, Los.Pelones, La Barredora, Guerreros Unidos, Los Tequileros, La Mano

con Ojos, Los Chamorros, Cartel del Centro, Los Granados, Los Rojos, Cartel de Tlahuac, Los Metros, Fresitas, Los Rojos-Tampico, Los Dragones, Vieja Escuela, Talibanes, Jose Pineda, Los Tena, Guardia Guerrerense, El Gallito, La Resistencia, Los Teos, Los Rojos-Ciclones-Cardenas, La Union de Leon.

Chapter 5

Drug Wars and Cartel Diversification in Mexico

This chapter analyzes the first part of the argument I have put forth: that an intense government war against drugs creates strong incentives for specialized drug cartels to diversify their activities. In this chapter, I first introduce the government War on Drugs in Mexico that began in December of 2006 and make the argument that it was a shock to the drug market. I then present a novel qualitative dataset that tracks the activities that each drug cartel was involved in from 2000 to 2012. Exploiting the timing of the crackdown and of cartel diversification, I provide evidence that drug cartels diversified their activities in response to intensified government intervention in the drug market. To provide more detail, I also present short case studies of each drug cartel and their diversification patterns. I then discuss alternative explanations for cartel activity diversification in Mexico and explain why the data is inconsistent with those explanations. I finish the chapter by arguing that cartels diversifying beyond drug trafficking had important implications for the internal structure of cartels as they had to evolve as organizations, and for the prevalence of the crimes cartels began to be involved in.

5.1 The Government Drug War

The government crackdown began on December 11, 2006 when newly elect President Calderon formally declared war against drug cartels and deployed 6,500 military troops and federal police to the state of Michoacán. Following the executive branch's "Comprehensive Strategy for the Fight against Drug Trafficking of the Mexican State",[1] the army implemented the "Directive for the Comprehensive Combat of Drug Trafficking 2007–2012"[2], which deployed federal forces throughout the country. The main objective of these operations were drug eradication, drug interdiction, and arrest of high-level drug traffickers. While government drug wars had been implemented in the 1970s and 1980s, the drug war declared in December of 2006 was different in-kind than any past crackdown due to its geographic reach, intensity, and duration (Trejo and Ley 2020).

By 2011 approximately 45,000 members of the federal forces had been deployed throughout the country (Calderón et al. 2015). Despite three different presidents ruling since then, this drug war remains the de facto policy. This policy is often colloquially referred to as the Mexican War on Drugs, which not only significantly increased the role of federal forces in fighting drug cartels and drug trafficking, but also substantially intensified both federal and state efforts. This is because operations varied in how they were implemented, from being directly led by federal troops to regional commands where federal forces coordinated efforts with state and local level governments.

To identify when these operations began across the country, I use official documents from the Secretariat of National Defense (SEDENA) and the Executive Branch that recorded each operation against drug trafficking between 2006 and 2012. Table 5.1 shows the years that operations against drug trafficking began in each state.

To show that this crackdown was a negative shock to the drug market and was conse-

[1] Estrategia Integral del Combate al Narcotráfico del Estado Mexicano.
[2] Directiva para el Combate Integral al Narcotráfico 2007–2012.

Table 5.1: Year that operations against drug trafficking began in each state. States arranged alphabetically. Source: Informe de Gobierno 1, 2, and 3 (2007, 2008, 2009), SEDENA (2012).

Year Begin	State
2007	Baja California, Campeche, Chiapas, Chihuahua, Durango, Guerrero, Jalisco, Michoacan (Dec. 2006), Nayarit, Nuevo Leon, Oaxaca, Quintana Roo, Sinaloa, Sonora, Tabasco, Tamaulipas, Veracruz, Yucatan
2008	Aguascalientes, Coahuila, Hidalgo, San Luis Potosi, Zacatecas
2009	Colima, Mexico City, Guanajuato, Morelos, Puebla, Tlaxcala
2010	Baja California Sur
2011	State of Mexico

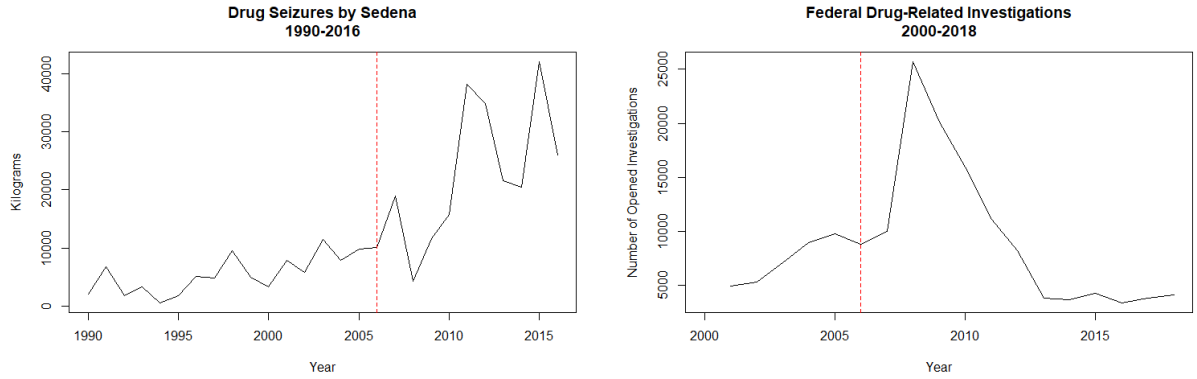


Figure 5.1: Time trends of drug seizures and investigations of federal drug crimes (not including investigations for drug possession). Drug seizures include amphetamine, pseudoephedrine, cocaine, opium gum, heroin, and methamphetamine.

quential for drug cartels, I use data on drug seizures from SEDENA and federal drug offenses (not including drug possession for personal use) conducted by the PGR. Figure 5.1 plots this data, which provides suggestive evidence that the government's counterdrug operations increased the risk of drug trafficking. Data shows that drug seizures remained fairly constant from the mid-1990s until 2006, after which seizures increased dramatically. Additionally, the number of investigations about federal drug offenses, which had gradually increased from 2000 to 2006, skyrocketed following the government crackdown.

5.2 Drug Cartel Activity Diversification

To provide evidence that the government crackdown prompted cartels to diversify their activities, I conduct a systematic review of over 100 documents tracking cartel activity between 2000 and 2012, including academic articles, government reports, expert reports, investigations by journalists, and news reports. Through these documents, I attempt to identify (i) what activities each cartel was involved in during this period, and (ii) when they first entered each activity.

To create this data, I first processed all documents (reports, articles, maps, tables, charts) from official and expert sources that provided systematic information on cartels in Mexico from 2000 to 2012. By "systematic" I mean documents providing information on all cartels and for the entire country. I did this to get an initial general picture of the type of information available and identify gaps. I collected documents from three types of sources: U.S. and Mexican government agencies, non-government specialists, and news media. There were 11 sources in total, from which I collected over 60 documents.

After this process, I began searching for cartel-specific information through systematic internet searches. This process provided dozens of additional sources of information, primarily news media, NGO and expert reports, freedom of information requests, and academic articles.

5.2.1 Measuring Cartel Activities

When reviewing each document, I sought to identify when a cartel entered an activity in a systematic manner and not in a transient or isolated manner. For example, an individual instance of cartel members being arrested for extorting a business was not sufficient to classify that cartel as being systematically involved in extortion.

I purposefully exclude certain activities that are perpetrated by cartels and sometimes presented as profit-making activities. I do so because these activities, to the best of my understanding, are not profit-generating activities. Most notably, these include investment in real estate,

hitmen (*sicariato*), cash-based businesses, and money laundering. First, "sicariato" is sometimes mentioned as an activity that Mexican cartels are involved in by popular media. By this they mean cartels paying individuals to be street soldiers and kill rivals. However, I do not consider this a profit-making activity, rather an activity to build coercive capacities. Second, real estate, cash-based businesses, and money laundering are frequently mentioned as activities cartels are involved in. Again, I do not consider these activities as profit-generating activities. Instead, these are common ways to launder profits from other activities. That is, they are activities meant to take profits from other activities and integrate them into the formal economy.

In addition, to identifying specific activities each cartel diversified to, I attempt to identify when they diversified to these activities. I rely on identifying the timing on two different factors: (i) evidence of a cartel not being involved in the activity to identify the lower bound, and (ii) evidence that a cartel is systematically involved in the activity to identify the upper bound. The implication is that the upper bound is sometimes a conservative, or slightly delayed, estimate.

Limitations

The data collection process has important limitations, most due to the difficulty studying illicit non-state actors that rely on secrecy. The most notable is that because Mexican cartels were specialized drug traffickers for so long, it took the government, experts, and reporters some time to recognize that they had systematically began to diversify their portfolios. For example, in the state of Sinaloa, home to the Sinaloa Cartel, security experts began identifying important increases in oil theft in 2007-2008, but it took two years to explicitly connect the Sinaloa Cartel to this increase. More broadly, this means that there are important information gaps during those crucial years when cartels began to diversify ($\sim$ 2007-2010). These information gaps are most notable for specific cartels (e.g., Cartel del Milenio, Cartel de Juarez) and certain activities (e.g., extortion and drug dealing). While ideally I would have access to the financial records of these organizations through time, that is unfeasible and I therefore rely on other public information.

Table 5.2: Activities drug cartels diversified to and timing of diversification. CDG = Cartel del Golfo/Cartel del Noreste; CDS = Cartel de Sinaloa; CDT = Cartel de Tijuana; CDJ = Cartel de Juarez; CDM = Cartel del Milenio/Cartel Jalisco Nueva Generacion; LFM = La Familia Michoacana/Caballeros Templarios.

	2000	2001	2002	2003	2004	2005	2006	**2007**	2008	2009	2010	2011	2012
Drug trafficking	All	All	All	All	All	All	All	All	All	All	All	All	All
Oil theft								CDG, CDS		CDT, LFM	CDM		
Migrant exploitation					CDG				CDT		LFM		
Drug dealing								CDG, CDT		CDM	LFM		
Extortion								CDG, CDS	CDT	CDJ, CDM	LFM		
Kidnapping for ransom								CDG	CDT	CDJ	CDS, LFM		
Theft										CDM, CDJ	LFM		
Looting mines									CDS	LFM			Zetas
Illegal logging									LFM		CDS		

5.2.2 Results

A summary of the results are presented in Table 5.2, with the full table broken down by cartel shown in Table 5.3. The tables shows the first year each drug cartel was identified as having systematically entered different activities from 2000 to 2012.

Results show that all drug cartels began diversifying systematically following the government crackdown. The results also show great heterogeneity in the diversified portfolios constructed by each drug cartel. First, all drug cartels quickly turned to some form of non-capital intensive activity, with the most prevalent being extortion, theft, kidnapping for ransom, and drug dealing. However, I find important differences in the degree of diversification to these non-capital intensive activities. For example, drug cartels like the Gulf Cartel and Michoacan Family Cartel turned heavily to these activities, Juarez Cartel and Tijuana Cartel did as well but to a somewhat lesser degree, while Sinaloa Cartel and Milenio Cartels seem to have only minimally engaged in these activities.

Second, all drug cartels also turned to capital intensive activities. For example, Sinaloa Cartel, Michoacan Family Cartel and the Zetas turned to looting mines, Sinaloa Cartel and Michoacan Family Cartel were also heavily linked with illegal logging activities. One interesting finding is that oil theft, in particular, proved to be a key capital intensive activity that almost all drug cartels turned to soon after the crackdown.

Table 5.3: Activities beyond drug trafficking that each cartel entered and the timing, 2000-2012. Novel dataset created by author.

Cartel	Activity	Year Entered
Cartel del Golfo/Zetas	Migrant fees	2004
	Oil theft	2007
	Human smuggling	2007
	Migrant kidnapping	2007
	Drug dealing	2007
	Extortion	2007-2008
	Kidnapping for ransom	2007-2008
	Looting mines	
	Piracy	
Cartel de Sinaloa/BLO-CPS	Oil theft	2007-2008
	Oil theft	2007-2009
	Extortion	2007-2010
	Human smuggling	
	Looting mines	
Cartel de Juarez/Nuevo Cartel de Juarez/La Linea	Oil theft	2007-2014
	Extortion	2009-2010
	Kidnapping for ransom	2009-2010
	Migrant smuggling	
	Looting mines	
Cartel de Tijuana	Oil theft	2007-2010
	Drug dealing	2007-2009
	Human smuggling	2008
	Prostitution	2008
	Extortion	2008
	Kidnapping for ransom	2008
Cartel del Milenio/Cartel Jalisco Nueva Generacion	Oil Theft	2007-2010
	Extortion	¡2010
	Drug dealing	¡2010
	Vehicle theft	¡2010
	Piracy	
	Counterfeit medical goods	
	Avocados	
La Familia Michoacana/Caballeros Templarios	Oil Theft	2007-2010
	Kidnapping for ransom	
	Extortion	¡2010
	Drug dealing	¡2010
	Vehicle theft	¡2010
	Piracy	
	Migrant smuggling/trafficking	
	Illegal logging	
	Looting mines (iron)	¡2010
	Avocados	

5.2.3 Results by Cartel

While I can examine the overall timing of diversification and the activities each cartel diversified to, there are important differences across cartels. Despite all cartels diversifying their activities following the government drug war, their diversification strategies differed. These differences are likely due to factors like proportion of control over the drug market, corruption capability, leadership style, drug cartel structure, among others. These factors also likely influenced the degree and intensity of diversification. As important as these factors may be, systematically analyzing these unique factors is beyond the scope of this study. However, I provide short case studies of each cartel given the evidence collected to provide some insight into the diversification patterns of each cartel.

Cartel de Sinaloa (CDS)

> CDS seems to have maintained a strong hold on drug trafficking following the crackdown. It appears that CDS did diversify to other activities, though sources make it clear activities beyond drug trafficking remained secondary activities, at least in the first few years after the crackdown. Sources seem to suggest that while CDS did turn to predatory activities like extortion and kidnapping for ransom, their involvement in these activities was relatively limited. Data on oil theft in CDS strongholds suggests CDS turned to oil theft around 2007-2008, though this activity remained a small part of their portfolio until later years. It has been suggested that one reason CDS seems to not have diversified to the same degree as other cartels is that its capabilities to corrupt high-level government officials may have protected its investments in drug trafficking from the crackdown to some degree. If this is accurate, it may be the case that corruption, like diversification, could also be a strategy to reduce risk under market shocks.

Cartel de Tijuana/Cartel de los Arellano Felix (CAF)

> It appears that CAF quickly turned to predatory activities following the crackdown. Operating in a major border crossing, sources also report that CAF turned to migrant smuggling. Sources seem to suggest that CAF did diversify to a large degree following the government crackdown. This may be partially explained by their limited operations in drug producing regions of the country, so, as Guerrero (2011) explains, even before the crackdown, CAF relied heavily on other cartels supplying them with large drug shipments that they then smuggled into the US. With a shock to the drug market, this likely affected their business model, making them rely on other activities.

Cartel del Milenio/Cartel Jalisco Nueva Generacion (CDM/CJNG)

There is not as much information on CDM as there is on other cartels. This may be because, as some sources seem to suggest, they operated more clandestinely than other cartels. Historically, reports suggest that CDM specialized in producing and trafficking methamphetamine to the US. However, there is evidence that they turned to oil theft by 2010 and predatory activities soon after the government crackdown. Nevertheless, they seem to have maintained drug trafficking as a primary activity in their portfolios like CDS.

La Familia Michoacana/Caballeros Templarios (LFM)

LFM was the first affected by the government crackdown since the first military deployment was sent to the state of Michoacan, LFM's home state and stronghold. LFM very quickly diversified to predatory activities. While they remained drug traffickers, and specifically, major drug cultivators and drug producers given the international port they controlled and that Michoacan's geographic characteristics make it suitable to cultivate poppy (used to synthesize heroin), they also became deeply involved in other activities. However, they became extremely predatory as well and turned heavily to activities like extortion and kidnapping for ransom. However, they also quickly turned to capital intensive activities, including oil theft, illegal logging, and looting mines.

Cartel del Golfo/Zetas (CDG/Zetas)

CDG was perhaps the first Mexican cartel to systematically diversify and the Zetas (operating under CDG until 2009) were pioneers of geographic expansion. An ethnographic study of CDG finds that they began diversifying to the migrant exploitation market in 1997 when they first began charging fees for smugglers moving Central American migrants through their home state of Tamaulipas. In 2004 CDG began charging smugglers of Mexican citizens as well. However, their involvement in this market changed in 2007 after the crackdown when they began directly exploiting migrants themselves and using them as a source of revenue. More generally, they diversified far more intensely in 2007-2008 following the government crackdown. CDG diversified widely, both to capital and non-capital intensive activities. Sources point to CDG as the first Mexican cartel to enter the oil theft business, which rivals quickly copied. In fact, scholarly and journalist investigations point to CDG being involved in the theft of crude oil from the refinery in the state of Tamaulipas and selling it to US companies in Texas prior to the crackdown but turning to oil theft of refined products from pipelines following the crackdown. While CDG and Zetas remained drug traffickers, they also began extensively relying on other activities.

Cartel de Juarez (CDJ)

CDJ is another cartel that is covered much less by sources than other cartels. However, the information that exists points to CDJ turning to predatory crimes, such as extortion, kidnapping for ransom, property theft, and local drug dealing, quickly after the crackdown. The patterns of operation and diversification between CDJ and CAF are very similar. This makes sense given that they are both cartels that operate primarily on the US-Mexico border and rely heavily on other cartels to supply them with drugs to traffic.

5.2.4 Alternative Explanations for Cartel Diversification

The prevailing explanation for cartel diversification in Mexico is advanced, though not tested, by both Guerrero-Gutiérrez (2011) and Trejo and Ley (2020). Guerrero-Gutiérrez (2011) suggests that drug cartels may "seek to diversify their revenues in order to sustain costly and prolonged wars" (38). Trejo and Ley (2020) build on this research and argue that in order to fund *protracted* wars over drug trafficking routes, drug cartels sought additional sources of revenue in new territories. These authors argue that "[a]s turf wars for the control of drug trafficking routes become more intense, cartels are likely to expand beyond the drug business... in order to remain competitive" (Trejo and Ley 2020, 64). This argument implies that we should observe the following: drug cartels going to war over drug trafficking and subsequently[3] diversify their activities.

Yet, the timing of criminal wars and diversification are inconsistent with this argument. Deadly criminal wars over trafficking routes began in the 1990s and intensified in the early 2000s (Trejo and Ley 2020, Ch. 2-5), with "Mexico's five major cartels... engag[ing] in six prominent turf wars between 1990 and 2006" (Trejo and Ley 2018, 3). Trejo and Ley (2018; 2020) even track the creation of military militias by cartels to fight criminal wars during this period and place them in 1990, 1993, 1995, 1998, and 2002. Figure 5.2 tracks the beginning of cartel wars and the chronology of the emergence of cartel militias, government drug war, and cartel diversification. If criminal wars over trafficking routes was the main driver of diversification and expansion, we

[3]When these conflicts become prolonged or protracted is unspecified.

should observe cartels diversifying during the 1990s and early 2000s to fund their military militias and criminal wars, and cartels diversifying in a staggered manner depending on when they began fighting. Instead, I find that drug cartels quickly diversified after the government crackdown, which began "[a]fter sixteen years of inter-cartel conflict" (Trejo and Ley 2020, 4). Nevertheless, it is very possible that the increasing number of wars between criminal organizations that began after the government crackdown likely exacerbated the incentives to diversify prompted by the crackdown.

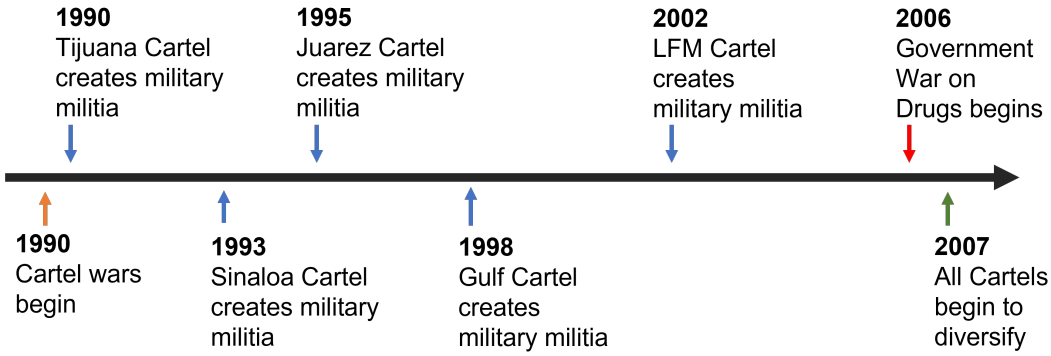


Figure 5.2: Timing of cartel wars, creation of cartel militias, the government drug war, and cartel diversification. Data on timing of cartel wars and creation of cartel militias: Trejo and Ley (2018; 2020).

Additionally, the theoretical model presented here suggests that the argument that drug cartels diversified to *increase* revenue to fund criminal wars is inconsistent. This is because diversification actually *reduces* the expected returns of a portfolio, especially since the activities cartels diversified to were less profitable than drug trafficking. To illustrate, imagine that a cartel can re-invest $1 million USD per month into its activities. It can choose to invest it all into drug trafficking (the activity with the largest profit margin), or split the investment, spending some on drug trafficking, some on oil theft, some on extortion, some on kidnapping for ransom, and so on. This diversified portfolio would provide fewer expected returns, as no investment has higher expected returns than drug trafficking. That is, it is certainly the case that for a large drug cartel, investing everything into trafficking a ton of cocaine into the US is more valuable than

investing less into trafficking cocaine and instead invest that some of that capital into extorting local businesses like taco stands, tortilla shops, and mechanic shops, among others. Therefore, the argument that drug cartels diversified to increase returns is theoretically inconsistent.

Another prominent alternative explanation for cartel diversification in Mexico is the fragmentation of the large drug cartels that existed in the 1990s and 2000s. Some have suggested that it was the cartel fragments that broke from larger cartels, not drug cartels themselves, that diversified into other activities as they could not compete against drug cartels in the drug trade once they fragmented and were thus forced to engage in other criminal activities. While it is the case that cartel fragments are involved in a diverse set of activities, this does not speak to drug cartels themselves. First, the qualitative evidence presented here shows that large drug cartels *did* diversify, and second, the evidence provided by this paper further shows that drug cartels expanded to places with oil pipelines as a result. Additionally, using data from the MCO project that tracks cartel fragmentation from 2000 to 2018, I plot the temporal order of cartel fragmentation from 2006 to 2018 in Figure 4.2. The figure shows that, with one important exception, cartel fragmentation began in 2010, *after* drug cartels had already diversified their portfolios, not the inverse. This is consistent with the idea that drug cartels diversified their activities, then began to experience fragmentation, and these fragments continued to operate like the cartel they fragmented from: as diversified criminal enterprises.

5.3 Consequences of Cartel Diversification

In later chapters I demonstrate that cartel diversification had important geographic and political implications. However, these were not the only consequences of cartel diversification. Cartels diversifying to new activities had important implications for cartels themselves as organizations given their transformation into criminal enterprises, as well as for the prevalence of the crimes in which they got involved.

5.3.1 Effects on Cartels

Cartels diversifying their activities and entering new markets has important implications for their internal organization. Transitioning from specialized drug traffickers to criminal enterprises requires internal restructuring and organizational growth. Diversifying into new activities after specializing in one activity for so long requires, among others, developing or acquiring new expertise, labor, and assets.

Specifically, cartels diversifying to non-capital intensive activities meant transitioning or recruiting new members whose main role would be these new activities and not drug trafficking. Diversifying to capital intensive activities entailed investing in creating groups of members that specialized in these new activities that require far more infrastructure and specialized capacity and knowledge. A low-level drug trafficker may relatively easily be transitioned into undertaking extortion activities of local businesses, but turning them into effective illegal loggers or oil thieves is far more difficult.

The managerial side also changed as a result of diversification. While middle and upper-level members had to manage the investments in and operations related to the drug market, diversification implies having to manage complex portfolios and low-level employees involved in a wide variety of activities. Managing traffickers that pack drug shipments into cargo trucks is different than managing individuals in charge of collecting weekly payments from local businesses.

Organizationally, specializing in drug trafficking meant that cartels were, for the most part, network-based organizations that relied heavily on logistical knowledge to transport large amounts of drugs through Mexico and to the US. Getting involved in domestic markets with different characteristics than the drug market meant that cartels had to adapt their structure and modus operandi. For example, markets like migrant smuggling and trafficking require recruiting human smugglers and traffickers, gaining expertise in human trafficking routes, collecting constant information on migration flows, and building networks with US and Mexican migration officials,

among others.

Thus, diversification drove Mexican cartels to evolve organizationally. How each specific cartel evolved likely reflects contextual conditions, path dependence, and other factors, but their evolution shares common factors. For example, to integrate new activities, cartels began creating specialized sub-units dedicated to specific activities that are overseen by local or regional bosses, which likely increased the relevance of local bosses. Figure 5.3 shows the stylized structures of drug cartels prior to diversification and the stylized structures of drug cartels after transforming into criminal enterprises.

5.3.2 Effects on Crime

Cartels diversifying their portfolios and entering new markets also had major implications for the prevalence of criminality. To provide evidence of this, I use the state-level panel dataset on drug cartel presence by Signoret et al. (2021b) and official crime rates. Figure 5.4 shows the per capita rates of extortion, kidnapping, property theft, and total oil theft incidents from 2000 to 2017 in states with important drug cartel presence[4] versus states with no or marginal drug cartel presence[5] in early 2007. By showing the trends and separating them by states with and without drug cartel presence during the first quarter of 2007 we can see where these activities increased after the crackdown and to what extent.

The data show that non-capital intensive activities were more prevalent before the crackdown in states with drug cartels and also increased far more drastically in these states after the crackdown. Interestingly, these activities also increased an important amount in states without drug cartels in early 2007, albeit to a much lesser extent. This suggests that drug cartels did expand their diversified operations beyond states they already operated in and rather quickly as

[4]Aguascalientes, Baja California, Baja California Sur, Campeche, Coahuila, Chiapas, Chihuahua, Durango, Guerrero, Hidalgo, Jalisco, Michoacan, Nayarit, Nuevo Leon, Oaxaca, Quintana Roo, Sinaloa, Sonora, Tabasco, Tamaulipas, Veracruz, and Yucatan

[5]Colima, CDMX, Guanajuato, State of Mexico, Morelos, Puebla, Queretaro, San Luis Potosi, Tlaxcala, and Zacatecas.

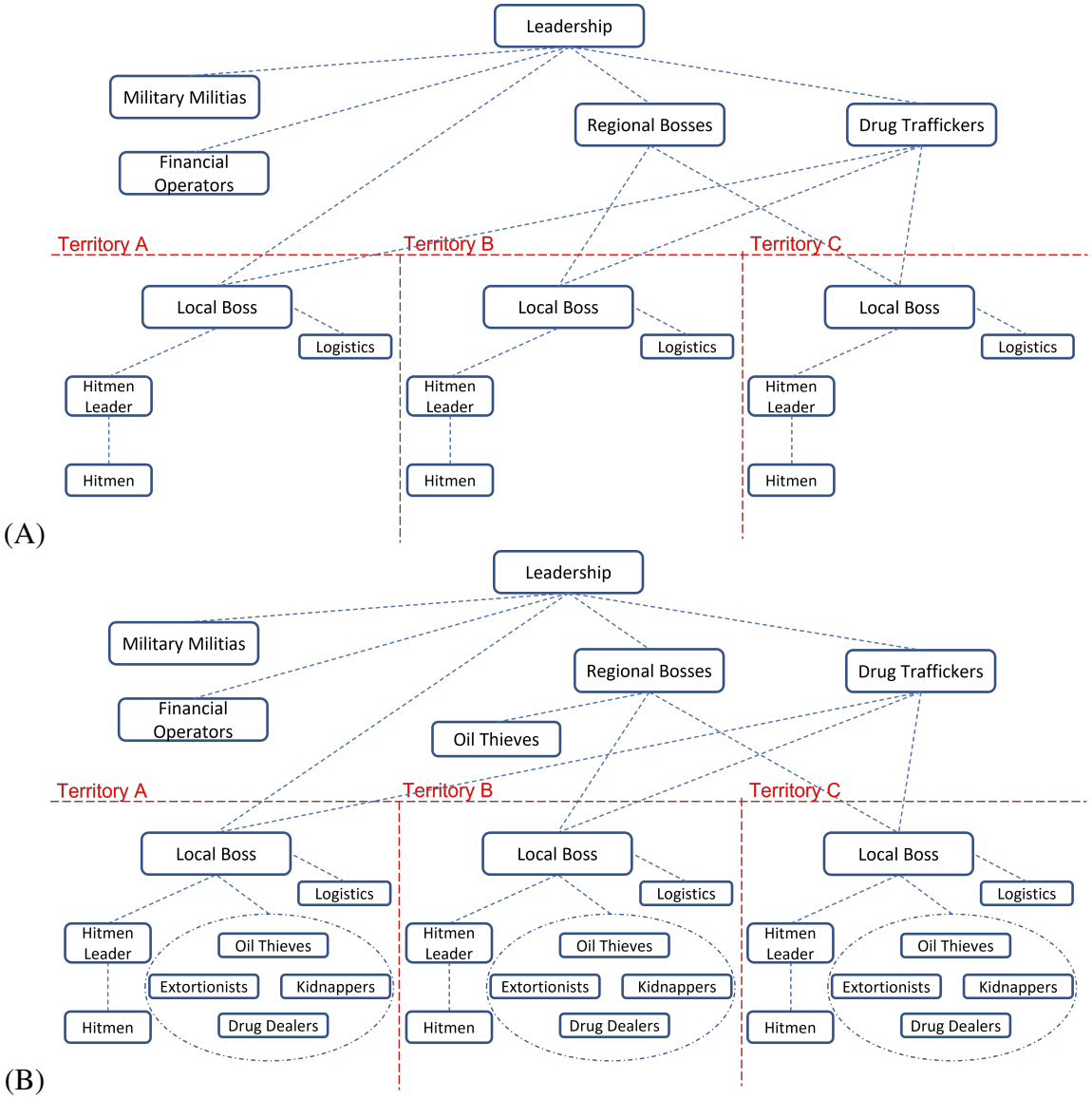


Figure 5.3: Stylized structure of Mexican drug cartels (A) before diversification, and (B) after diversification.

well, though to a lesser extent.

The data also shows a that the capital intensive activity drug cartels diversified to, in this case oil theft, increased gradually following the crackdown, albeit more quickly initially in states with preexisting drug cartel presence, and subsequently in states that did not have drug cartel presence prior to the crackdown. This suggests that drug cartels first began expanding to places with oil pipelines that were geographically closer to exploit this market, and then

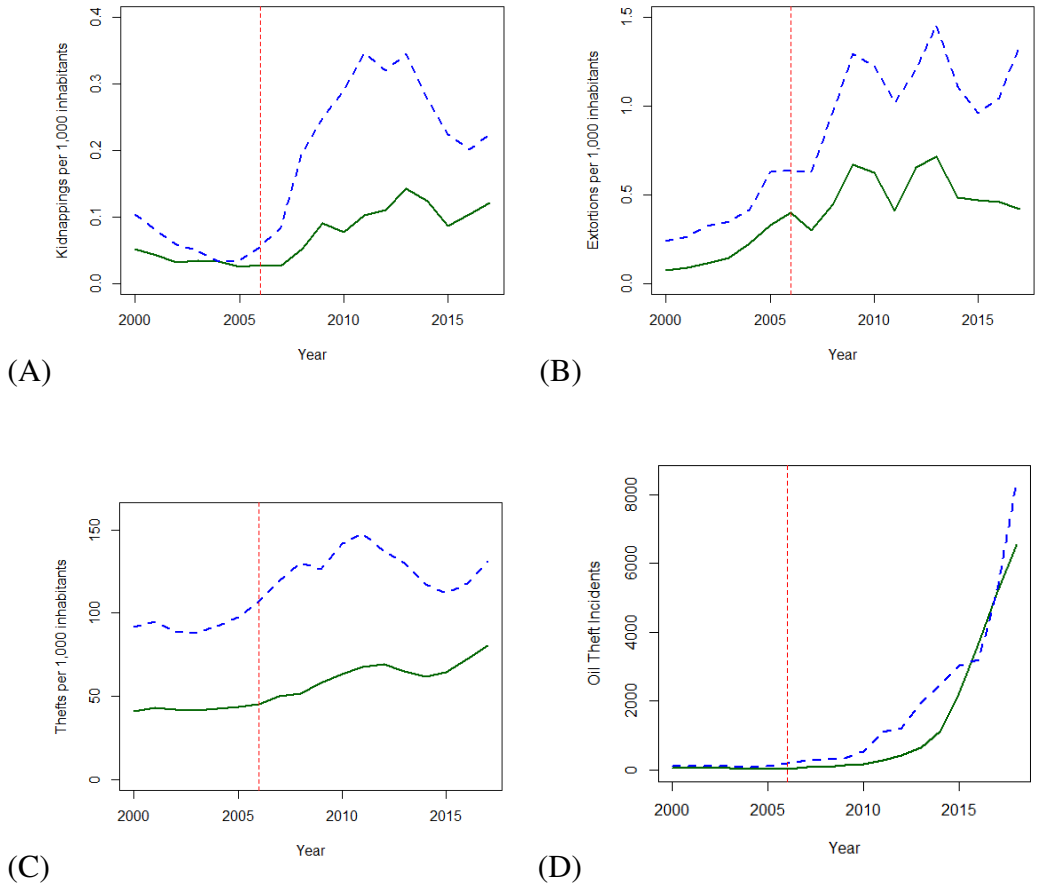


Figure 5.4: Average rates (per 1,000 individuals) of reported (A) kidnapping, (B) extortion, (C) theft, and (D) oil theft incidents from 2000-2017 in states with no or marginal drug cartel presence (solid line) versus states with significant drug cartel presence (dotted line) during the first quarter of 2007.

started expanding to states where they had previously not operated to further exploit this market. Interestingly as well, unlike non-capital intensive activities, oil theft in states without drug cartels at the start of 2007 caught up to the levels of oil theft in states with strong drug cartel presence—something not seen in non-capital intensive markets, suggesting the importance of this market regardless of geographic proximity.

5.4 Conclusion

This chapter introduced the government War on Drugs that began in December of 2006 and spread throughout the country over the following six years. While this was not the first time the Mexican government had cracked down against drug trafficking, earlier enforcement policies were geographically restricted and had been led by an enforcement agency that had interests in controlling, rather than eliminating, drug trafficking. Since the 1980s, however, no such policies had been implemented. The crackdown that began in December of 2006, on the other hand, was different in kind. It encompassed a national-wide effort to combat drug trafficking, deployed the military and sent them to the streets, and left drug traffickers, and got state governments involved as well. I provided suggestive evidence that this crackdown did create a sudden shock to the drug market.

I then introduce a qualitative dataset tracking the activities each cartel was involved in between 2000 and 2012 that measures *when* cartels diversified to each activity. Exploiting the timing of the government drug war, I provide evidence that this government policy resulted in drug cartels diversifying their portfolios to include other activities besides drug trafficking. I also provide case studies denoting general patterns of diversification for each cartel.

I finish the chapter by discussing two key consequences of cartels diversifying their activities. First, cartels had to transform their internal organization to integrate new markets. This involved recruiting employees and acquiring new expertise and assets. Second, I provide evidence that cartels entering new illicit markets led to the prevalence of these activities increasing substantially. Moreover, many of these crimes are predatory crimes, such as kidnapping for ransom and property theft, that impact the well-being of regular citizens. In the next chapter I estimate this more rigorously, but one important consequence of cartel diversification was the negative impact it had on public safety and citizen well-being.

Chapter 6

Cartel Diversification Into Oil Theft

> *Nuestro negocio es el narcotráfico, pero dado que está flojo, pues robamos hidrocarburos (Our business is drug trafficking, but since it is weak, we steal hydrocarbons).*
> —- Gulf Cartel Leader, 2007[1]

The previous chapter presented evidence that in reaction to the Mexican government's increased efforts against drug trafficking, cartels diversified their activities beyond illicit drugs. I have argued that, to the extent that cartels choose to enter lucrative activities that are geographically fixed and outside of their strongholds, cartels face strong incentives to expand geographically in search of these new business opportunities. Subsequently, when entering these new political jurisdictions, cartels seek to capture the local state apparatus to protect their new activities.

To explore this argument, in this chapter I turn to oil theft, an activity that all cartels diversified to following the government drug war. Oil theft provides a good activity to test the argument for two key reasons. First, all drug cartels turned to this activity and it became a primary component of their portfolios, meaning that it is important to understand substantively. Second, oil theft is an activity that is geographically fixed: Oil theft entails stealing refined oil products, such as gasoline and diesel, from underground pipelines and selling them to local buyers. Thus, to enter the market, cartels had to operate in territories with oil pipelines, but most of these territories

[1] Pérez (2012, 39). Translated by author.

were outside of cartel strongholds. Thus, to enter the market, cartels had to strategically move to territories with oil pipelines. This chapter therefore focuses on oil theft to rigorously explore the geographic and political implications of cartel diversification.

In the following sections, I first provide a descriptive narrative of the history of oil theft in Mexico and how cartels got involved in the market. Second, given the theoretical framework presented in this dissertation, I discuss why oil theft proved so attractive to cartels despite it not being an obvious activity for them to get involved in. Concretely, I argue that oil theft was an activity which reduced the risk of cartel investments given cartel's preexisting involvement in the drug market. Third, I provide evidence that cartels entering the oil theft market resulted in cartels expanding geographically and strategically targeting their expansion to territories where oil theft could be exploited. Finally, I provide evidence that this cartel expansion had negative repercussions on local democratic accountability and citizen well-being.

6.1 Oil Theft and Cartels in Mexico

Mexico's oil sector is run by the state-owned petroleum company Petróleos Mexicanos (Pemex). Pemex is the second largest oil company in Latin America in revenues behind Brazil's Petrobras. Until 2017, Pemex had monopoly over gasoline stations and fuel sales in Mexico, and regulated their domestic prices so that consumers were not affected by international market prices or its fluctuations. Pemex has six functioning refineries, the most recent being inaugurated in 1979. To transport crude oil and its refined products (most importantly gasoline and diesel), Pemex has long relied on trucks and ports. However, for decades its logistical backbone has been oil pipelines that run underground throughout the Mexican territory. In total, Pemex oversees over 17,000 kilometers of pipelines passing through almost 400 municipalities in 24 of its 31 states plus the federal district.

Oil theft has been a problem faced by Pemex for decades. Small-scale theft from fuel

tanker trucks and Pemex facilities had existed for decades, with the first official record of oil theft from an oil pipeline dating to 1993 (Olivera Villaseñor and Rodríguez 2007). Between 1993 and 2003, Pemex recorded 304 total oil pipeline thefts (Olivera Villasenor and Rodriguez Castellanos 2005). However, it was not until the late 2000s that oil theft from pipelines became a major issue, with Pemex acknowledging that it cost it billions of US Dollars annually (Solis 2018; Loredo 2018).

The best account that we have about the history of oil theft in Mexico comes from Pérez (2012). According to this author, prior to the early-2000s, oil theft was undertaken primarily by mid and low-level Pemex employees. These employees employed a variety of methods to steal oil to sell in the domestic black market, including stealing from refineries, production and storage sites, and tapping the pipelines. The employees trained on how to tap oil pipelines, many of which stole oil from pipelines independently, became known as *tapineros*.

Simultaneously, in some parts of the country small groups also participated in rudimentary oil theft from pipelines. For example, there existed some small independent groups that would find a pipeline, dig a hole around it, bust the pipe, let the hole fill up, and then use buckets or containers to steal the oil. This practice became known as *huachicoleo*, and those involved became known as *huachicoleros*. And while certain tapineros amassed small fortunes and many huachicoleros benefited financially, theft from oil pipelines was considered a marginal problem prior to the 2000s.

During this period, cartels were not involved in the oil theft market. As Perez documents, the Juarez, Tijuana, Sinaloa, and Gulf Cartels (and later the Zetas while still part of the Gulf Cartel) had established relationships with Pemex and the Pemex workers union for decades. These cartels would regularly use the Pemex transportation infrastructure to traffic drugs through the country and up north to the US-Mexico border, for example, by using Pemex tanker trucks with false bottoms to hide and transport drugs. Interestingly, despite decades of close relations with Pemex, these cartels were not interested or involved in oil theft or the illegal oil market.

However, Perez notes that starting in 2007, cartels began getting involved in this activity more systematically and with greater intensity. For example, Perez delineates how La Compañía (the name of the organization composed of the Gulf and Zetas cartels) began to take control over pipeline tapping where they already operated in the northeast region of Mexico starting in 2007. La Compañía first recruited, intimidated, corrupted and forced Pemex tapineros to pay the group a part of their profits, work for them, and teach them how to steal oil from ducts. Soon after, however, La Compañía began organizing and integrating the tapineros into their structure and took over the oil theft activities themselves. Offshoots of the Zetas and rival cartels quickly followed suit and began to enter the oil theft market through tapineros and by organizing huachicoleros. Not long after, cartels had practically taken over the market.

Importantly, oil theft requires some level of specialized knowledge and organizational sophistication, specific capabilities that cartels did not have prior to the crackdown or before entering the oil theft market. For one, the location of the oil pipelines is confidential, as the Mexican government classifies this information is part of its national security. Therefore, knowing the exact location as well as when refined products flow through the pipelines—refined products are not transported through pipelines continuously—requires insider information from Pemex personnel. In addition, stealing oil from pipelines requires expert knowledge about how to safely tap pipelines—it is very high risk to do so without this knowledge. Moreover, "Pemex allocates millions of dollars to its pipeline monitoring systems, which verify their safety and operation in real time with all kinds of technology... In short, oil theft is detected at the precise moment it occurs and it is possible to mobilize all the agents and soldiers required to prevent it" (Pérez 2012, 355).

Therefore, as Perez notes:

> The theft of hydrocarbons from Pemex [by cartels] would not be possible without the participation of the company's employees. Not everyone can connect to the pipeline network[...] This theft involves personnel from operations, distribution, storage, and sales. (Pérez 2012, 154).

Finally, oil theft requires building the logistical capacities to transport, store, and distribute the oil in large quantities throughout neighboring territories by acquiring warehouses, storage tanks, tanker trucks, and workers, among others. In addition, cartels need to establish a local network of buyers—effectively building demand—that often includes clandestine gas stations, official gas stations, local businesses like mechanic shops, and large companies like factories and transportation companies. As Perez notes, "[Oil theft] did not happen spontaneously: many networks of support and collaboration were gradually woven [between cartels and] Pemex employees and contractors" (39).

6.2 Why Oil Theft?

The questions remains: Why oil theft? Oil theft is not an obvious activity for cartels to get involved in, nor is it obvious why they chose to include it as an essential component of their diversified portfolios as opposed to other activities. Cartels had built a tight relationship with the oil industry for decades but never entered the oil theft market until after the government drug war. The theoretical framework presented in this paper sheds light on this puzzle. The illicit hydrocarbon market has four central characteristics that made it especially attractive for drug cartels: (i) cartels had pre-existing connections with the hydrocarbon sector that made it a viable option, (2) the expected returns from this activity were very high, (3) government enforcement against oil theft was practically non-existent, and most importantly, (4) the expected returns were uncorrelated with those of drug trafficking. This meant that the oil theft was an ideal candidate for drug cartels seeking to diversify their portfolios since investing in both the drug and oil markets helped minimize the risk associated with investing in these activities together.

First, reports often claim that drug cartels got involved in oil theft due to its high returns. Yet, while high returns certainly make this activity potentially attractive, they are not enough to explain drug cartels diversifying to this activity nor the timing. In fact, oil prices are subsidized

in Mexico, with prices slowly and steadily increasing over the past two decades, meaning that there was no sudden jump in prices in 2007 that could explain the timing. Moreover, Mexico is a middle income country with innumerable thriving economic sectors that potentially offer high returns. More than simply having high returns, I argue that drug cartels having a pre-existing connection with Pemex employees and the Pemex workers union made oil theft a viable option to diversify to since drug cartels were aware of oil theft through the Pemex employees they worked with.

Second, drug cartels likely saw the high returns oil theft could potentially offer. To give some idea about the expected profits, Pemex has reported annual losses from oil theft to be $1.79 billion USD in 2016, $2.86 billion USD in 2017, and $3.68 billion USD in 2018 (Solis 2018). In 2018, the Federal Government reported that Pemex registered an average loss of 55,981 barrels[2] of oil products from oil theft *per day* (Ramirez 2021). According to Pérez (2017), stolen refined oil products are usually sold at half the price that legal products are sold and cheaper when they are sold wholesale. A rough estimate thus places the upper value of the oil theft market at about $800 million to $1.84 billion USD per year between 2016 and 2018. While this is a fraction of the drug market, it is still an incredibly lucrative market.

Third, government enforcement against oil theft was practically non-existent given that it was a marginal issue prior to cartels entering the market. For one, since the government crackdown was designed to counter drug trafficking, the government was unprepared to deal with drug cartels entering the hydrocarbon market. Moreover, unlike extortion, theft, and kidnapping, cheap oil products benefits individuals and businesses, so it likely attracts less public scrutiny while also providing substantially larger profits. Lastly, and very importantly, domestic gasoline and diesel prices in Mexico are subsidized, and are therefore not subject to market fluctuations. In other words, prices are stable and do not depend on the international price of oil, so drug cartels could count on the continuous demand and stable prices. This means that the expected returns of

[2]One barrel contains 42 gallons, so 55,981 barrels translates to 2,351,202 gallons.

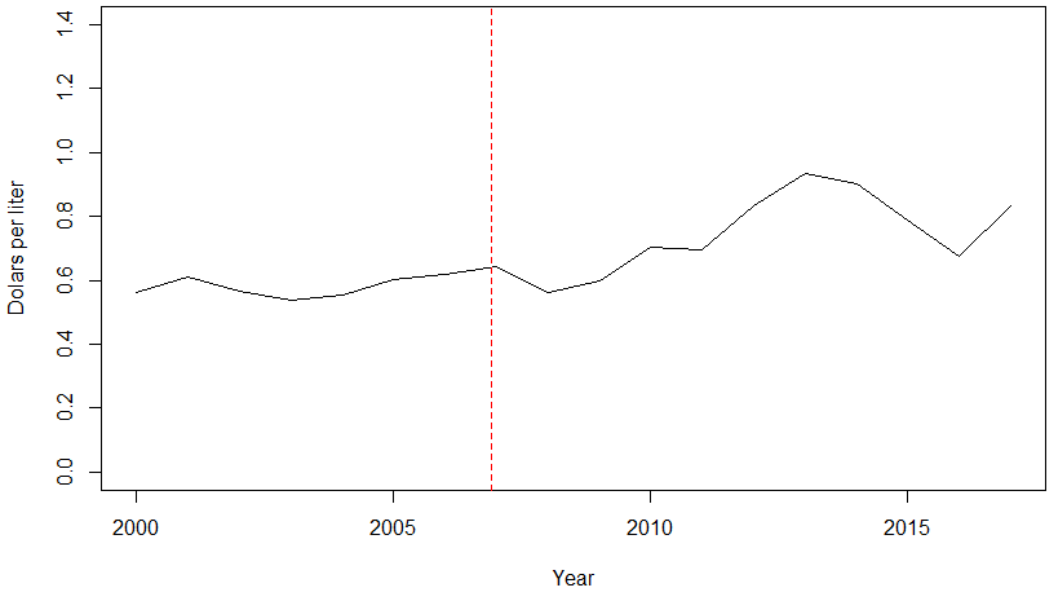


Figure 6.1: Gasoline price per liter at the pump in USD from 2000 to 2017.

oil theft are stable and thus the risk of investing in it is low. Figure 6.1 shows the price of gasoline in Mexico in from 2000 to 2017.

Fourth, and most importantly, the expected returns for oil theft are negatively correlated with those of drug trafficking both in price and geographically, making it an ideal candidate for diversification. Figure 6.2 shows the correlations between the price of gasoline in Mexico and the price of wholesale drugs (heroin and cocaine) in the US from 2000 to 2017. The plot shows that there is no correlation between wholesale cocaine prices and gasoline prices, and there is a negative and statistically significant correlation between gasoline prices and heroin prices. This means that oil theft provided a great option for cartels to spread the risk associated with their investments because if their investments in drug trafficking took a hit, returns from their investments in oil theft remained stable or even increased.

In addition, prior to the crackdown drug cartels had minimal presence in municipalities with oil ducts, with no more than 6% of municipalities with oil pipelines having drug cartel presence prior to 2007. This suggests that the government's crackdown against drug trafficking

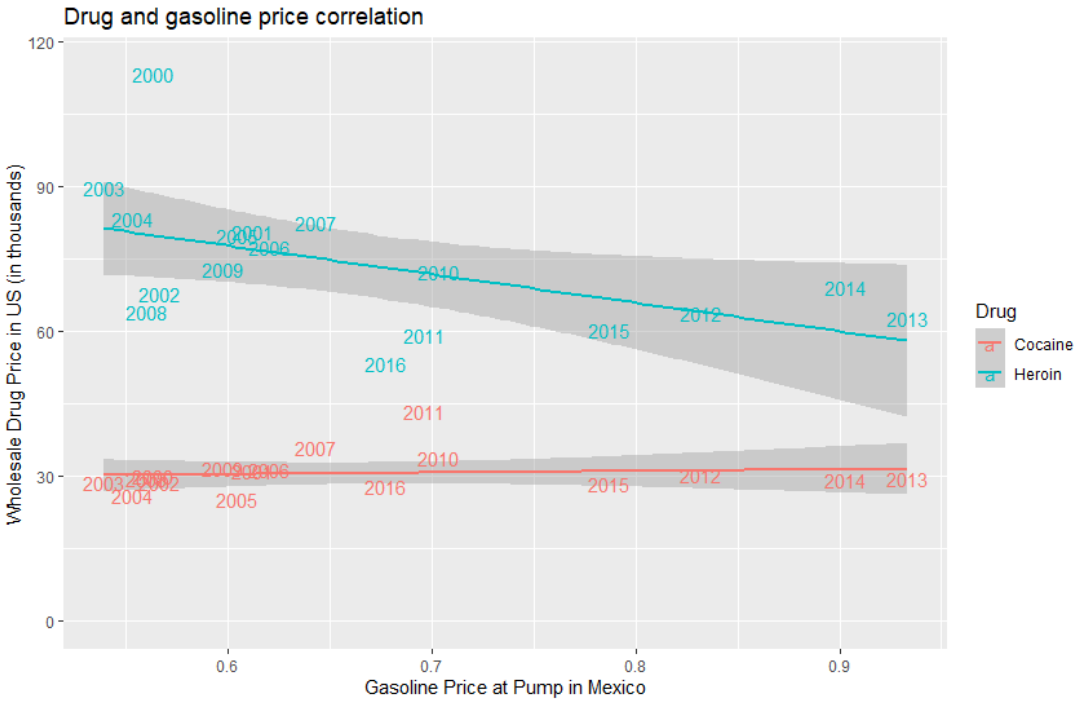


Figure 6.2: Correlation of wholesale cocaine and heroin prices in the US and gasoline prices in Mexico from 2000 to 2017.

likely had minimal spillover effects on oil theft operations, at least in the short to medium term until the government readjusted strategies. To provide more systematic evidence of this, I calculate the distance from each municipality to an oil pipeline and regress this distance on the presence of drug cartels prior to the crackdown. Results (shown in Appendix Table A.1) show that the coefficient is negative and statistically significant. This negative geographic correlation between drug cartels presence and oil pipelines prior to the crackdown, in addition to the null and negative correlations in prices, made oil theft the ideal market for drug cartels to diversify to in order to minimize the risk of their portfolios.

6.3 Geographic Implications

An important feature of certain capital intensive activities cartels diversified to is that they are often geographically fixed, so that they can only be exploited in specific places. Oil

theft, specifically, can only be perpetrated in municipalities with oil pipelines. This means that for cartels to exploit this market, they need to operate in territories with oil pipelines. This is not just for stealing the oil products, however, as oil theft is a capital intensive activity that requires building local networks and specialized knowledge. For one, the location of the oil pipelines is confidential, as the Mexican government categorizes this information as part of its national security. Therefore, knowing their exact location as well as when refined products flow through the pipelines (refined products are not transported through pipelines continuously) requires insider information from local Pemex personnel. Stealing oil from pipelines also requires expert knowledge about how to safely tap pipelines as it is a very dangerous task to do. Moreover, oil theft by cartels often needs and benefits from collusion from Pemex employees and members of the local security agency to assure it can be done without state intervention. Organizationally, oil theft also requires developing the local logistical capacities to transport, store, and distribute the oil in large quantities throughout neighboring territories by acquiring warehouses, storage tanks, tanker trucks, and workers, among others. Cartels also need to establish a local network of buyers that often includes clandestine gas stations, official gas stations, local businesses like mechanic shops, and large businesses like factories and transportation companies. In sum, cartels need to establish their presence and operations in territories in and around oil pipelines to be able to enter and exploit the market.

Yet, prior to the crackdown cartels had minimal presence in municipalities with oil ducts. Figure 6.3 plots number of oil theft incidents from pipelines between 2000 to 2018 in states with important cartel presence[3] versus states with no or marginal cartel presence[4] in early 2007. By showing the trends and separating them by states with and without cartel presence during the first quarter of 2007 we can see where these activities increased after the crackdown and to what

[3]Aguascalientes, Baja California, Baja California Sur, Campeche, Coahuila, Chiapas, Chihuahua, Durango, Guerrero, Hidalgo, Jalisco, Michoacan, Nayarit, Nuevo Leon, Oaxaca, Quintana Roo, Sinaloa, Sonora, Tabasco, Tamaulipas, Veracruz, and Yucatan.

[4]Colima, CDMX, Guanajuato, State of Mexico, Morelos, Puebla, Queretaro, San Luis Potosi, Tlaxcala, and Zacatecas.

extent.

The plot shows a that oil theft increased gradually following the crackdown, albeit more quickly initially in states with preexisting cartel presence, and subsequently in states that did not have cartel presence prior to the crackdown. This suggests that cartels first began expanding to places with oil pipelines that were geographically closer to exploit this market, and then started expanding to states where they had previously not operated to further exploit this market. The slow and gradual increase in oil theft incidents following the government crackdown is also consistent with the capital intensive nature of the market, that is, that cartels did not have the immediate capacity or knowledge to fully exploit this market, and had to build it over time.

The expectation, therefore, is that we should observe cartels expanding their presence to territories with oil pipelines following the government crackdown. I use data on cartel presence at the local level and the location of the oil pipelines to provide descriptive evidence of this pattern. Figure 6.4 shows the mean cartel presence in municipalities with and without oil pipelines. The raw data suggests that cartels expanded significantly after the government crackdown, and that they seem to have targeted that expansion to municipalities with oil pipelines more than other places. This provides preliminary evidence that cartels did strategically target their expansion as a result of the crackdown. I explore this more systematically in latter sections.

6.4 Data

6.4.1 Cartel Presence

To analyze where cartels operate and whether the government drug war drove them to expand their presence to territories with new markets, I use the panel data on where cartels operate introduced in Chapter 4. This data measures the geographic presence of cartels in Mexico at the municipal level from 2000 to 2018. More specifically, I use the data on the geographic presence of the main drug cartels in Mexico since my theoretical framework focuses on large drug cartels.

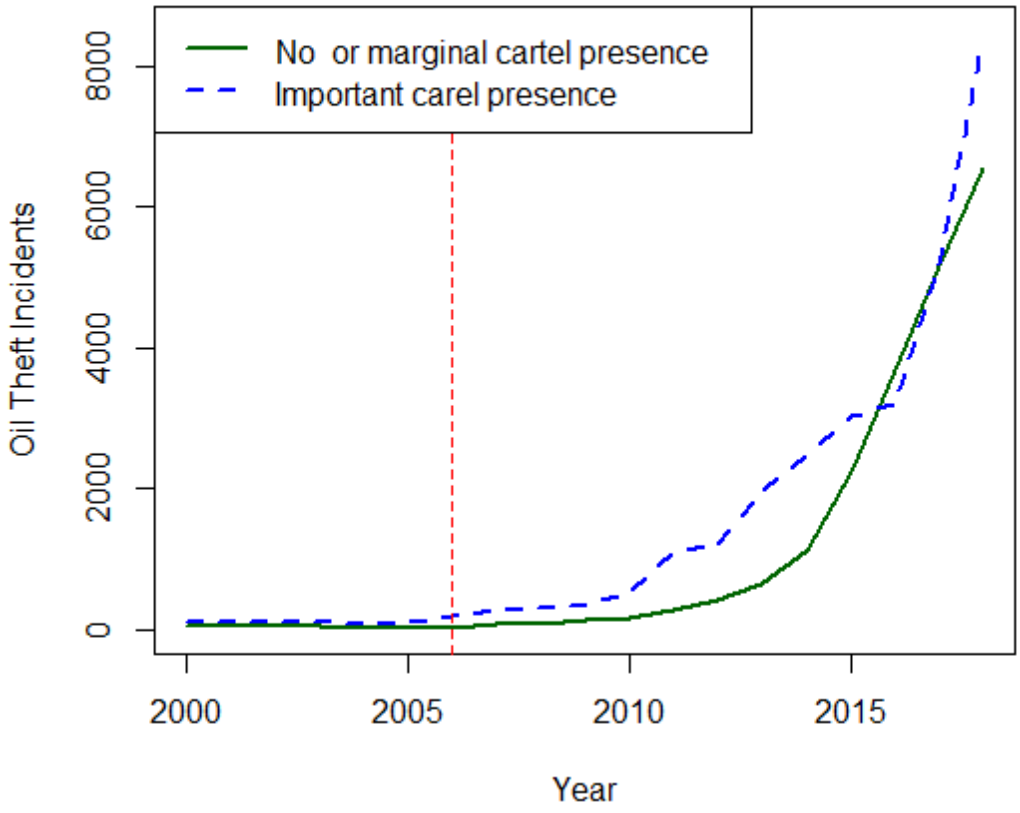


Figure 6.3: Number of oil pipeline theft incidents from 2000-2018 in states with no or marginal cartel presence versus states with significant cartel presence during the first quarter of 2007.

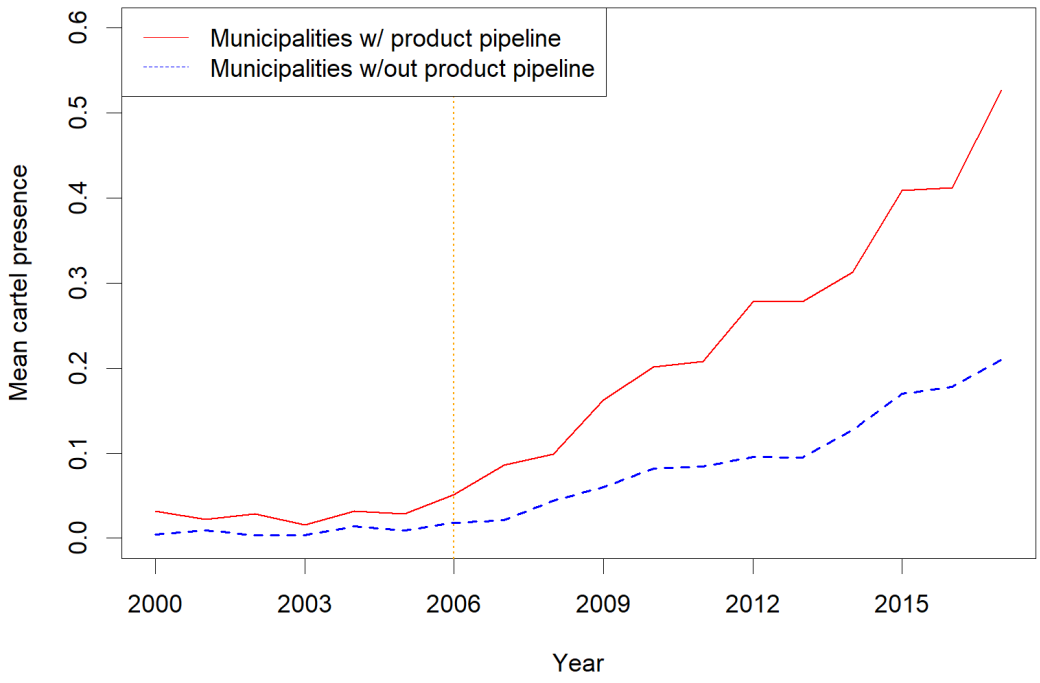


Figure 6.4: Average cartel presence in municipalities with and without oil pipelines. Solid red line shows mean cartel presence in municipalities with oil pipelines. Blue dashed line shows mean cartel presence in municipalities without oil pipelines.

In the analyzes on the consequences of cartels, I also use data on the geographic presence of small criminal organizations that fragmented from the large cartels as a control variable.

6.4.2 Oil Pipelines

To measure where the new lucrative activity of oil theft from oil pipelines can be fully exploited I use the georeferenced location of the pipelines. Pemex does not make the georeferenced location of the pipelines public since the federal government considers it a matter of national security. However, through freedom of information requests, Carto Critica, a Mexican think tank, has obtained the georeferenced location of the pipeline network. While they do not make the shape file available, I use high definition images to georeference the national pipeline network. This network includes product pipelines that transport refined oil products used by individuals and companies like gasoline and diesel and crude oil pipelines that transport crude oil. Using the cartographic information for municipalities made available by INEGI, I determine which municipalities have a crude pipeline and which have product pipeline. For the main estimation, I use product pipelines since these carry refined products valuable for cartels. I use the location of crude oil pipelines as a placebo test following the main results since crude oil is worthless to cartels.[5]

Figure 6.5 shows the geographic location of product and crude oil pipelines. In total, Pemex oversees over 17,000 kilometers of pipelines passing through almost 400 municipalities, including 5,213 km of crude oil pipelines and 8,946 km of product pipelines. Product and crude oil pipelines were constructed prior to the 2000s and before cartels were involved in oil theft.

6.4.3 Government Drug War

The government crackdown against drug trafficking did not affect all territories at the same time. Instead, the federal government began operations across states at different times

[5] See placebo test section for more information.

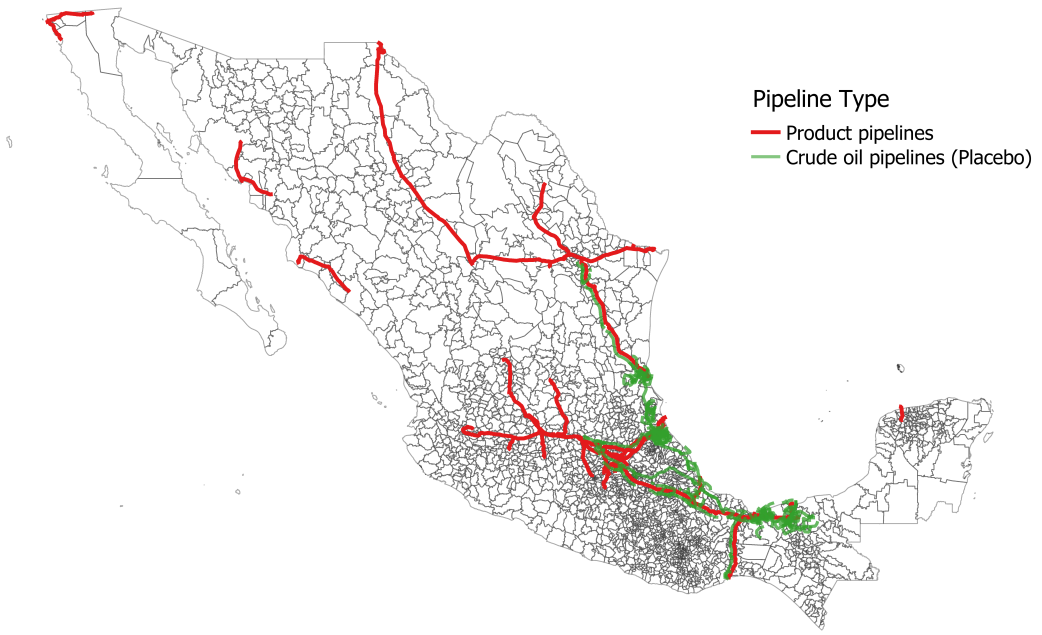


Figure 6.5: Geographic location of oil pipelines. Red lines show product pipelines. Green lines show crude oil pipelines. Data from CartoCritica.

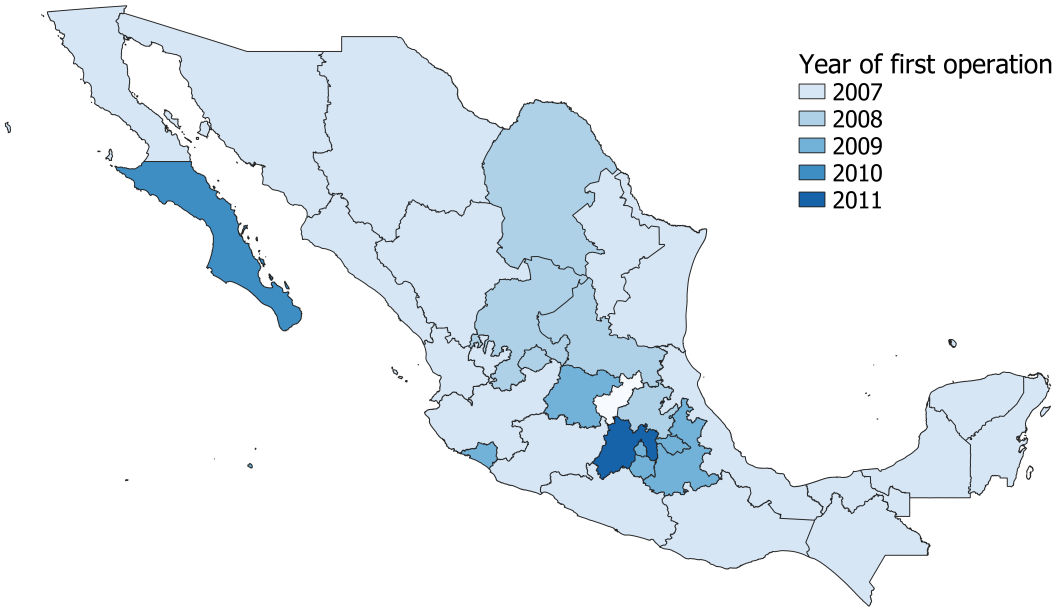


Figure 6.6: Year federal operations against drug trafficking began per state. Source: Informe de Gobierno 1, 2, and 3 (2007, 2008, 2009), SEDENA (2012).

(SEDENA 2012). The main objective of these operations were drug eradication, drug interdiction, and arrest of high-level drug traffickers. Operations also varied in how they were implemented, from being directly led by federal troops to regional commands where federal forces coordinated efforts with state and local level governments.

I use official documents from SEDENA and the executive branch that recorded each operation against drug trafficking between 2006 and 2012 to identify when these operations began in each state. Table 5.1 shows the years that operations against drug trafficking began in each state and Figure 6.6 visualizes the geographic distribution.

6.4.4 Local Electoral Competition

The main observable implications of the theory are that cartels attack local democratic institutions in attempts to capture politicians. We should thus expect to see lower local-level electoral competition. To measure local electoral competition, I use municipal election results for mayors between 2007 and 2017 from Magar (2018). Municipal elections are held every three years, the timing varies across states, and they follow plurality rules. To operationalize electoral competition, I first calculate the winning margin, which ranges from 0 (perfect competition) to 1 (no competition). Another common measure of electoral competition is the number of candidates that run in a given election, particularly in a country like Mexico where dozens of political parties exist at the local level and where many candidates run for local office each election. I thus also use the number of candidates for local office (mayor) to measure electoral competition.

6.4.5 Crime and Violence

The theory further implies that cartels are able to successfully establish their activities due to state capture. As a result, we should observe increased levels of criminality in territories cartels expand to. To measure criminal activities, I use data on the number of extortions, kidnappings, and property theft at the municipality level come from Mexico's National Public Security System (SNSP), and include the time period from 2011 to 2017. While data aggregated at the state level that was used in previous sections exists prior to 2011, data disaggregated to the municipality level is only available starting in 2011.

Additionally, I follow existing work that uses drug-related hospitalizations as a measure of drug consumption to proxy for local drug markets (Ríos 2015). I use hospitalization records from the Mexican Department of Health to get the number of patients treated for drug use-related reasons in each municipality from 2010 to 2017. This dataset includes both public and private hospitals and clinics, and records all hospital visits due to marijuana, opiate (including heroin),

and cocaine use for reasons including overdoses, intoxication, withdraws, rehabilitation, mental or behavioral disorder, treatment, and other health-related reasons. I aggregate this data to a municipality-year unit of observation.

Finally, official data on homicides related to organized crime are only available between December 2006 and September 2011. I therefore rely on homicide data from INEGI to expand the period of analysis. Specifically, I use the homicides of young men (15-39 years old) as a proxy for homicides related to organized crime from 2007 to 2017. These homicides have been found to correlate highly—both temporally and geographically—with organized crime-related deaths (Calderón et al. 2015).

6.4.6 Covariates

First, oil pipelines often connect urban places and tend to travel close to, or along roads. To account for this, I calculate the road density of each municipality. I use the National Network of Roads, which geocodes the location of highways and roads in Mexico, and the cartographic information of each municipality–both made available by INEGI–to calculate the road density of each municipality.[6]

A potentially important covariate is the price of gasoline. Fluctuations in the international price of oil is often used to show the effect of oil on outcomes including economic development, regime type, violence, and corruption. A worry would be that steep increases in the price of oil, especially around 2007, could explain why cartels diversified into oil theft. In Mexico this is not a concern because fuel (gasoline and diesel) is subsidized: the prices for consumers are controlled by Pemex and do not depend on international prices of oil so there is very little fluctuation across time and space. This has resulted in a steady increase in prices throughout the past two decades without any steep increases or fluctuations. Nevertheless, I control for this using data

[6]Road density is equal to the length of roads in a municipality (km) divided by the area of a municipality (km$\hat{2}$).

from Mexico's Secretariat of Energy on the price of low octane gasoline (Magna)[7] at the pump in constant 2015 pesos per liter.

Another potential covariate could be that oil pipelines run through territories that are valuable for drug trafficking. Since territories closer to the US-Mexico border tend to be the most valuable for drug trafficking, and thus most valued by cartels, I measure the distance of each municipality to the US-Mexico border and include it as a covariate. I also include a dummy for municipalities along the US border, which are most valuable for trafficking drugs into the US as well as a dummy for municipalities with commercial ports, which are crucial for importing precursor chemicals that cartels use to produce drugs. Data on the location of ports are from the National Port System published by Mexico's Secretariat of Infrastructure, Communications and Transportation.

Finally, Mexico made major reforms to the energy sector in 2013 and 2014. Some experts have speculated that these reforms may have made the hydrocarbon sector more attractive for cartels. In the Appendix I discuss the energy reforms in detail, but here it suffices to clarify that the reforms allowed private companies to bid for contracts in the exploration and extraction process, which did not affect any of the incentives presented here. Gasoline and diesel prices remained controlled and subsidized, and prices were not allowed to vary by gas station until November 2017.

6.5 Cartel Geographic Expansion

6.5.1 Empirical Strategy

To test the hypothesis that cartels targeted their expansion to municipalities with pipelines following the government crackdown, I employ a staggered difference-in-differences (DiD) strategy using data from 2000 to 2017. In the model, I assign the municipalities with product

[7] In the United States this would be comparable to regular gasoline.

pipelines to the treatment group and without pipelines to the control group, and I set the start of the treatment as the year that the federal government began operations against drug trafficking in each state as part of the War on Drugs. This treatment timing varies from 2007 to 2011. Once a unit is treated it remains treated.

This specification compares organized crime presence in municipalities with and without oil pipelines before and after the government crackdown affected their state. If specific assumptions are met, this strategy allows us to estimate the causal effect of the government crackdown on organized crime expansion into territories with pipelines. The main assumption of identification under DiD estimation is that the control and treatment groups have parallel trends in the outcome before the treatment period. The trends can be seen in Figure 6.4, and show that this assumption holds.

One of the primary reasons I argue that the parallel trends assumption is especially strong is that the location of the product pipelines is orthogonal to cartel presence since they were installed prior to 2000—before the illicit oil market emerged, before cartels were involved in the oil market, before cartels had presence outside of limited regions, and before drug cartels had diversified away from drug trafficking in any meaningful way. Yet, they were not installed in a random or as-if random manner, just as highways are not randomly located, so treating the pipelines as such is not appropriate. The DiD approach is thus appropriate because identification using DiD does not require assignment to treatment to be random or orthogonal to the outcome. Yet, I argue that the location of pipelines being orthogonal to the outcome provides additional confidence in the results.

An important substantive concern, however, is that organized crime could have been following a straightforward expansion strategy where they moved to territories bordering those where they already operated, as the literature on Mexico seems to suggest (Calderón et al. 2015; Dell 2015).[8] If cartels were already operating close to or in territories adjacent to those with

[8] See Appendix for a review of these arguments.

product pipelines, they could have expanded to these territories for reasons other than stealing oil. This outward expansion strategy could perhaps explain the main results.

This substantive concern also raises an important methodological concern: spatial spillover effects. Due to the spatial nature of expansion, a concern with the data-generating processes is non-independence of units and spillover effects. This implies spatial spillover, or spatial interference, where unit i's outcome is affected by the outcome of its neighbors. Methodologically, the DiD estimator assumes units are independent of each other (part of SUTVA), an assumption that does not always hold when there is possible spatial interference, also referred to as spillover effects (Delgado and Florax 2015). If unit i's outcome is being influenced by unit j, then the DiD estimate could be biased as it may be capturing both the direct effect of the treatment and the indirect effect of its neighbors.

To test for spatial autocorrelation of the cartel presence variable, I conduct the commonly used Moran's I test for spatial dependency, which estimates how unit i's value at time t is correlated with the values of its neighbors at $t-1$ (Moran 1948). Moran's I statistic ranges from -1 (perfect dispersion) to 1 (perfect clustering of units with equal values). Running this test on the data on cartel presence gives a test statistic of 0.13 with a p-value < 0.001, confirming that some spatial interference is present in the data on cartel presence.

To account for this spatial interference and control for outward expansion, the main DiD strategy employed is a spatial DiD that estimates both direct and indirect effects. I do so by using the spatial autoregressive model (SAR), which accounts for spatial spillover by modeling the spatial interference in the regression analysis (Anselin 2001). SAR does this by controlling for the average outcome of observation i's neighbors $j \in \Phi$ at time $t-1$. That is, for each municipality I determine its contiguous neighbors–the municipalities it shares borders with, calculate the mean outcome of these neighbors at $t-1$, and use this measure as a control in the regression (by lagging this variable I assume that the outcome of the neighboring municipalities last year might affect

this year's outcome). The spatial DiD is as follows:

$$\begin{aligned} cartel_{it} =& \alpha_i + \tau_t + \rho cartel_{\Phi(t-1)} + \gamma_1 pipeline_i + \gamma_2 crackdown_{st} \\ &+ \delta_{DiD}(pipeline_i * crackdown_{st}) + \gamma_3 X_{it} + e_{it} \end{aligned} \tag{6.1}$$

where the outcome variable $cartel_{it}$ denotes either the total number of cartels or a dummy variable indicating presence for municipality m in year t. This way I estimate both the intensive and extensive margins of organized crime presence. $cartel_{\Phi(t-1)}$ is the mean outcome for unit i's neighbors Φ at time $t-1$. In this model ρ estimates the indirect effect of the treatment on unit i (the spatial interference) while δ_{DiD} estimates the causal effect of interest. $crackdown_{st}$ is a dummy variable whose value is a 1 starting on the year that federal operations against drug trafficking began in each state, s, and 0 otherwise. The variable $pipeline_i$ takes on a value of 1 if a municipality has a pipeline and 0 if it does not. Finally, X_{it} denotes the controls and α_i and τ_t are municipality and time fixed effects. Standard errors are clustered at the municipality level.

The main coefficient of interest is δ_{DiD}, which estimates the average treatment effect on the treated (ATT), tells us the effect that the crackdown had on cartels expanding to territories with pipelines. The coefficient ρ is also of interest, since it captures contiguous expansion–the spillover effects.

I use three different estimators to estimate Equation 6.1. First, I use a two-way fixed effects (TWFE) interaction model to estimate the standard DiD that applied researchers are most familiar with. However, recent scholarship has shown that the DiD estimate from TWFE can sometimes be a weighted average of underlying causal treatment effects, making it difficult to interpret the coefficient directly, and may be subject to some bias (Goodman-Bacon 2021; Sun and Abraham 2021; Callaway and Sant'Anna 2021; Athey and Imbens 2022). To account for this, I also estimate the DiD using the approaches suggested by Sun and Abraham (2021) (herein SADiD) and Callaway and Sant'Anna (2021) (hererin CSDiD). Following CSDiD, I employ the doubly robust unconditional DiD given that the raw data show parallel trends. A limitation

of this approach is that covariates can only be incorporated to create covariate-specific parallel trends, not to control for or estimate their coefficients. I therefore also estimate the SADiD, which is based on a dynamic TWFE regression and does allow for the integration of covariates since, unlike CSDiD, their "estimation method can be cast as a regression specification" (Sun and Abraham 2021, 177).

It's important to note the spatial specification is conservative as it likely underestimates the direct effect of product pipelines on cartel expansion because it assumes that all of the indirect effect on municipality i by its neighbors, Φ, is due to spatial spillover. In other words, it assumes that if a municipality with a product pipeline running through it has contiguous municipalities with organized crime presence, organized crime presence in the treated municipality is partially due to spatial spillover. Yet, it could be that organized crime expanded to this neighboring municipality not because it was adjacent to their territory but specifically because it has a product pipeline.

6.5.2 Results

Table 6.1 shows the main results using the cartel dummy as the outcome measure. Columns (1)-(2) present the results using TWFE, columns (3)-(4) present the results using SADiD, and column (5) presents the results using CSDiD. Columns (1), (3), and (5) do not use the spatial lag of cartel presence in neighboring territories while (2) and (5) do. Results using the number of cartels in a municipality as the outcome are included in the Appendix and show the same results. All models use cluster robust standard errors. Figure 6.7 plots the dynamic average treatment on the treated of the crackdown on municipalities with oil pipelines before and after the government crackdowns with 95% confidence intervals estimated from model 5 in Table 3.

First, the results support the two patterns of cartel expansion following crackdowns: expansion to contiguous territories *plus* targeted expansion to territories with lucrative new markets, in this case municipalities with oil pipelines. Specifically, the results show that spatial spillovers,

Table 6.1: Drug war and cartel expansion, DiD Results.

	Cartel Dummy				
	TWFE		SADID		CSDID
	(i)	(ii)	(iii)	(iv)	(v)
Crackdown*Pipeline	0.152***	0.119***	0.138***	0.106***	0.138***
	(0.016)	(0.015)	(0.017)	(0.017)	(0.005)
Spatial spillover		0.370***		0.356***	
		(0.019)		(0.020)	
Covariates	No	Yes	No	Yes	No
Observations	44,208	41,531	44,208	41,531	44,208
R^2	0.411	0.447	0.418	0.452	
Municipality fixed effects	Yes	Yes	Yes	Yes	
Year fixed effects	Yes	Yes	Yes	Yes	

Notes: Standard errors clustered at municipality level. TWFE = Two-way fixed effects. SADID = Sun and Abraham (2021). CSDID = Callaway and Sant'Anna (2021).

or expansion to contiguous territories, are substantively and statistically significant. Estimates from Table 6.1 model (4) suggest that a one unit increase in the neighboring municipalities average cartel presence the year prior, $t-1$, is associated with a 0.356 increase in cartel presence for municipality i in year t. This is not trivial, quite the contrary, as the mean number of cartels per municipality after the crackdown is 0.127.

Moreover, the results all strongly support hypothesis that cartels targeted their expansion to territories with oil pipelines following the crackdown. Again, spatial models likely underestimate the effect of expansion to municipalities with oil pipelines as the spatial lag may capture some or all of the effect of contiguous expansion even if the contiguous expansion is due to pipelines being present in a neighboring municipality.

Nevertheless, I interpret the more conservative model (4) from Table 6.1, which estimates the effects of the crackdown on the presence of cartels in municipalities with oil pipelines. These estimates suggest that the crackdown nearly doubled the mean number of cartels in municipalities with oil pipelines after the crackdown compared to those without pipelines. The results together imply that a significant portion of cartel expansion was targeted to municipalities with pipelines.

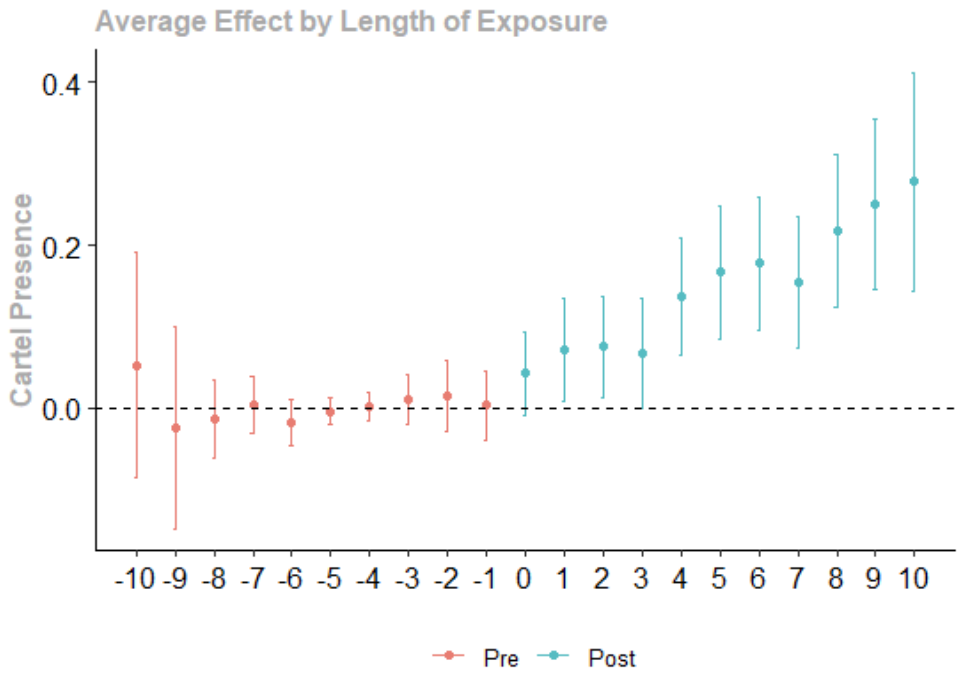


Figure 6.7: Drug war and cartel expansion, dynamic effects.

6.5.3 Threats to Inference and Alternative Explanations

The baseline DiD provides evidence that supports the main hypothesis. Yet, certain methodological or theoretic concerns might remain that are unaddressed by the main specification.

Methodologically, one might worry that the results are driven by some third variable related to where oil pipelines are installed and not pipelines themselves. In other words, places where oil pipelines are located, for some reason, might also be places that cartels are attracted to for reasons other than natural resource theft. To address this concern I use crude oil pipelines, which are worthless to cartels, as a placebo test to show that factors related to having pipelines are not driving the main results (see details in Appendix). Alternatively, organized crime could have expanded throughout the country for reasons other than new business opportunities and simply by chance moved to territories with pipelines more than other territories. To address this concern I use a Monte Carlo simulation to simulate cartel expansion and see how likely it is that we observe the main point estimates due to chance. Results, shown in the Appendix, show that it

is extremely unlikely that we see these results due to chance.

Theoretically, there are alternative explanations that might not be fully addressed by the DiD. First, it could be the case that sharp increases in oil prices around 2007 suddenly made oil theft a lucrative market to enter for cartels. The literature on the resource curse often uses shocks to the oil market to explain changing behavior of state or non-state actors. However, gasoline and diesel prices in Mexico were controlled and subsidized in Mexico during the time covered in this study. Figure 6.1 plots gasoline prices at the pump in Mexico from 2000-2017, showing that gasoline prices gradually increased year to year but without any sharp increases or fluctuations. Moreover, the year fixed-effects in the regression models controls for these time trends. Nevertheless, the gradual increase over time does increase the value of the market, making it increasingly lucrative for cartels once they diversified to it.

Second, the prevailing explanation for cartel expansion in Mexico is suggested, though not tested, by Trejo and Ley (2020). These authors argue that drug cartels diversify their activities to finance prolonged wars against rival cartels, and that to remain competitive, they seek to establish de facto control over territories where they operate as well as neighboring territories in order to establish subnational criminal governance regimes. This argument implies that we should observe the following: drug cartels going to war over drug trafficking routes, cartels diversify their activities, and subsequently expand to neighboring territories. Yet, the timing of criminal wars and diversification are inconsistent with this argument. Deadly criminal wars over trafficking routes began in the 1990s and intensified in the early 2000s (Trejo and Ley 2020, Ch. 2-5), with "Mexico's five major cartels... engag[ing] in six prominent turf wars between 1990 and 2006" (Trejo and Ley 2018, 3). Trejo and Ley (2018; 2020) track the creation of military militias by cartels to fight criminal wars during this period and place them in 1990, 1993, 1995, 1998, and 2002. If criminal wars over trafficking routes was the main driver of diversification and expansion, we should observe cartels diversifying and expanding during the 1990s and early 2000s to fund their military militias and criminal wars. Instead, I find that drug cartels quickly diversified after

the government crackdown, which began "[a]fter sixteen years of inter-cartel conflict" (Trejo and Ley 2020, 4). Moreover, the spatial DiD I estimate controls for expansion to neighboring municipalities, meaning that cartels were expanding beyond the territories surrounding them in search of new business opportunities. Nevertheless, it is very possible that the increasing number of wars between criminal organizations that began after the government crackdown likely exacerbated the incentives to diversify prompted by the crackdown.

Third, both scholars and policy circles have advanced the idea of the "balloon" or "cockroach" effect, where stronger enforcement in one place displaces them to other territories, that is, crackdowns cause displacement not expansion (Friesendorf 2007; Dion and Russler 2008; Windle and Farrell 2012; Bagley 2013). If the 2007 government crackdown in Mexico caused cartels to migrate rather than expand, and their displacement targeted territories with lucrative new business opportunities, we would risk misinterpreting empirical results as expansion rather than displacement. Anecdotal accounts place doubts that this was the case in Mexico. Historical cartel strongholds continue to be so, for example, Michoacan, Tamaulipas, Sinaloa, and Baja California, among others. However, to systematically examine the possibility, I calculate the percent of municipalities with cartel presence before and after the crackdown, and find that 91.51% of municipalities that had cartel presence between 2000 and 2006 also had cartel presence between 2006 and 2012.

6.6 Consequences of Cartel Geographic Expansion

Having provided strong evidence that the government drug war pushed cartels to strategically expand to territories where they could fully exploit the oil theft market, I now estimate the political and criminal consequences. In this section I exploit that cartels expanded to territories with oil pipelines after the crackdown to test the hypothesis that cartels negatively influence local democratic accountability and worsen citizen well-being.

6.6.1 Empirical Strategy

Endogeneity is an important concern when studying the relationship between cartels and electoral outcomes, illicit activities, and violence. It might be that cartels choose to expand to places that have have less political participation, are more corrupt, have less political accountability, more crime, or that are more violent. If this is the case, simple linear regression would underestimate the effect of cartels on political outcomes and crime. Moreover, the data generating process I propose follows from cartels expanding to places with product pipelines to cartels capturing local state officials, to cartels establishing their activities in these territories.

To overcome endogeneity concerns and to follow the data generating process, I use an instrumental variable (IV) approach by instrumenting cartel presence with product pipelines *after* the government crackdown (2007-2017). To estimate the IV I rely on the two-stage least squares (2SLS) estimator. Formally, the first-stage equation models the relationship between pipelines and cartels presence:

$$cartel_{it} = \alpha_1 + \gamma_1 pipeline_i + \gamma_2 fragment_{it} + \gamma_3 X_i + \tau_t + e_{it} \tag{6.2}$$

where $cartel_{it}$ denotes a dummy variable indicating presence for municipality m in year t. $pipeline_i$ is a dummy variable denoting whether a municipality has a product pipeline or not, X_i denotes the municipality-specific covariates (logged population, log of employed population, average education level, Gini coefficient, and road density), and τ_t are year fixed effects. Standard errors are clustered at the municipality level.

Additionally, as scholars have documented, Mexican cartels experienced a period of fragmentation after the crackdown where smaller cells that had operated under a larger parent cartel began operating independently (Guerrero-Gutiérrez 2011). Some of these smaller fragmented cartels are known to be involved in oil theft. As described in the identification section below, not including these cartels in the regression would violate the exclusion restriction. To take this into

account, I control for the geographic presence of these fragments in the IV specification, denoted by $fragment_{it}$.

The second-stage equation estimates the impact of cartel presence in territories with oil pipelines:

$$Y_{it} = \alpha_2 + \delta_1 \hat{cartel}_{it} + \delta_2 fragment_{it} + \delta_3 X_i + \tau_t + u_{it} \tag{6.3}$$

where Y_{it} denotes the different measures electoral accountability, crime, and violence, $\hat{cartel}_{it}$ are the fitted values from the first stage, X_i are the municipality-specific covariates, and tau_t are year fixed effects. Standard errors are clustered at the municipality level. The coefficient of interest is δ_1, which estimates the local average treatment effect (LATE) of cartels on electoral outcomes and crime.

Prior expectations are that the reduced form OLS coefficients will be smaller than the IV-2SLS coefficients for the following reasons. First, I expect most of the treatment effect to be driven by compliers, making the LATE bigger than the ITT. Second, if cartel presence is measured with some error, the IV-2SLS coefficients are likely to be larger than the OLS as an instrument can correct for the downward bias of measurement error (Lal et al. 2021).

Identification

Identification with IV relies on two primary assumptions, relevance and validity. Relevance is the assumption that the instrument predicts the main independent variable, or $\gamma_1 \neq 0$. In this case, it means assuming that oil pipelines predict the presence of cartels. While previous sections of paper have provided strong evidence that this is the case *after the government crackdown of 2007*, the first stage of the IV directly tests this assumption. Table 6.2 shows that this assumption is met.

The validity assumption entails both unconfoundedness and the exclusion restriction.

Table 6.2: Cartel Presence and oil pipelines (First Stage).

	Dependent variable:		
	Cartel Dummy		
	Pre-Crackdown (Placebo)	Post-Crackdown (Placebo)	Post-Crackdown
	(1)	(2)	(3)
Product pipelines	0.005		0.046***
	(0.004)		(0.008)
Crude oil pipelines		−0.005	
		(0.008)	
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	17,038	26,774	26,774

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the municipality level.

Unconfoundedness means that there are no confounder variables in the first stage and that conditional on controls, the instrument is uncorrelated with unobservables. The exclusion restriction assumption states that the instrument must only affect the outcome through the independent variable being instrumented. In this case, it must be that underground pipelines only affect criminal activity, cartel-related homicides, and electoral competition through cartels.

Unlike the first assumption, validity cannot be directly tested. Nevertheless, I provide substantive reasons for why it may hold and also conduct two placebo tests to build confidence in the instrument's validity. Substantively, the instrument is plausibly valid because oil pipelines run underground, were built decades before cartels turned to oil theft, their exact location are not public, and municipalities do not get any financial benefits or payments for having pipelines running through them.[9] Their location was also determined by a company owned by the national government, and thus municipalities did not self-select into having or not having pipelines, with

[9]With the exception of municipalities with refineries, which do get financial benefits. I therefore exclude the six municipalities with pipelines that also have refineries from the analysis.

their location being determined by the location of refineries and important logistical hubs, not socioeconomic factors.

Empirically, given that an instrument's validity cannot be directly tested, scholars may accidentally overlook some confounder or violation to the exclusion restriction. In this case, geographic instruments face the concern that they may be correlated with some geographic factor that violates the exclusion restriction and leads to pipelines being correlated with cartel activities. In applied work, placebo tests have become increasingly common to build additional confidence in the validity of the instrument. I rely on two placebo tests to build additional confidence in the instrument.

First, Lal et al. (2021) suggest a "zero-first-stage" test where a subsample of the population where the instrument is believed not to affect the treatment is used as the first stage. I do this by exploiting the timing of the crackdown by separating the sample into pre- and post-crackdown periods, with the expectation that the instrument, oil pipelines, only correlates positively with cartels presence after the crackdown began and not before. Second, I estimate the post-crackdown first stage using the location of crude oil pipelines instead of product pipelines to see whether they predict cartel presence. Crude oil pipelines provide an appropriate placebo test because they were built by the same company, Pemex, and their placement was also determined by the location of refineries and important logistical hubs. Importantly, however, crude oil pipelines were not lucrative for cartels, so we should not expect a correlation between them and cartels.

Table 6.2 presents the first stage of the IV, including both both placebo tests. Results show that oil pipelines only predict the presence of cartels *after* the government crackdown, not before, and that crude oil pipelines are not correlated with cartel presence after the crackdown.

6.6.2 Results

Table 6.2 shows the results for the first stage and the two placebo first stage tests: pre-crackdown sample and post-crackdown sample using crude oil pipelines. The table shows that

only post-crackdown product pipelines predict cartel presence, with the F-statistic being 50.77. The first stage results provide evidence that the relevance assumption is met, and build confidence in the validity assumption. That is, there does not seem to be some third factor connecting the location of pipelines and cartels other than the theft of refined oil products from product pipelines. The results for the reduced form are included in the Appendix. For space, I show results using the cartel dummy in this section and include those using the cartel count in the Appendix. All results are consistent.

First, Table 6.3 shows the main results for the effect of cartels on democratic accountability. In short, results find that cartels reduce electoral competition. Specifically, IV estimates suggest that Mexican cartels reduced the number of candidates running in local elections by seven candidates. This is a substantively large effect, as the mean number of candidates is 5.14. Cartels also reduced electoral competition, increasing the margin of victory for winning candidates by 0.33. These results provide evidence that cartels expanding to territories with oil pipelines began attacking local democratic institutions to capture the state.

Table 6.3: Cartels and local electoral outcomes (Second Stage)

	Dependent variable:	
	Margin of victory	Num. of Candidates
	(1)	(2)
Cartel dummy (instrumented)	0.331^{**}	-7.204^{***}
	(0.139)	(2.520)
Controls	Yes	Yes
Year FE	Yes	Yes
Observations	6,952	6,952
DV mean	0.134	5.867
DV sd	0.129	2.126
Note:		*p<0.1; **p<0.05; ***p<0.01
	Standard errors are clustered at the municipality level.	

Second, Table 6.4 shows the main results of the second stage for crime and violence. As argued, cartels seek to capture the local state apparatus to establish their presence and operations. Results suggest that cartels in Mexico have successfully accomplished this, with all point estimates being positive. That is, cartel presence in territories with pipelines is positively related with more violence and crimes, although the results for extortion are not statistically significant. The results are not only statistically significant, but also substantively meaningful. Looking at municipalities with cartel presence, IV estimates suggest that cartels increase homicides by 1.07 standard deviations (SDs), kidnappings by .5 SDs, drug use by 1.53 SDs, and theft by 1.25 SDs. These results suggest that cartels not only expanded their presence to territories with pipelines, but that they also exported other illicit activities to these territories.

Table 6.4: Cartels and crime (Second Stage).

	Dependent variable:			
	CO-related violence	Kidnapping	Drug dealing	Theft (in thousands)
	(1)	(2)	(3)	(4)
Cartel dummy (instrumented)	66.763***	2.987*	17.618***	3.783***
	(18.811)	(1.760)	(5.022)	(1.005)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Outcome mean	17.312	1.772	1.901	1.113
Outcome SD	62.455	5.939	11.482	3.032
Observations	26,774	17,038	19,472	17,038

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors clustered at the municipality level.

In the Appendix I also run the same model but using rates of crime and homicides per 1,000 people and without population on the right-hand side. The results are unchanged except for the drug hospitalization rate, which becomes statistically insignificant.

6.7 Conclusion

In this chapter, I discussed the entry of drug cartels into the oil theft market following the government drug war and presented the logic of cartels choosing to diversify to this activity given the theoretical framework presented in Chapter 3. Specifically, I argue that oil theft provided a good activity for cartels to diversify to in order to minimize the risk associated with their investments given their preexisting involvement in drug trafficking.

I then explore the geographic consequences of cartels choosing to enter the oil theft market, an activity which is geographically fixed and can only be perpetrated in specific territories, most of which cartels did not operate in prior to the government drug war. Exploiting the subnational timing of the government drug war, the georeferenced location of oil pipelines, and data on the geographic presence of cartels, I estimate a DiD and find that the government drug war drove cartels to expand their presence, and in particular, to target that expansion to territories with oil pipelines.

I then turn to investigating some of the political consequences of cartels expanding to new territories and its subsequent implications for citizen well-being. In Chapter 3, I argued that cartels seek to capture the local state apparatus when entering a new territory in order to protect their activities, which can reduce local democratic accountability. Using an IV approach, this chapter finds that cartels entering territories with oil pipelines significantly reduced electoral competition. Moreover, I argued that this observable implication of attempts to capture the state can, when successful, be detrimental to citizen well-being as cartels can then operate with some degree of impunity and perpetrate crimes, many of which are predatory towards citizens. This chapter finds that this is the case. Specifically, I find that cartels entering territories with oil pipelines significantly increased violence and crime.

Chapter 7

Integrating Quantitative and Qualitative Evidence

Theoretically, I have argued that when cartels enter new territories, they seek to obtain state protection by capturing local state officials. Two of the observable implications of this theory that can be tested through econometric techniques is their impact on local democratic accountability and citizen well-being. In the previous chapter I presented quantitative evidence of some of the observable implications of the theory: cartels entering territories with oil pipelines reduced local electoral competition and increased crime and violence. While those statistical models tell us that these consequences are present, they do not tell the whole story. In other words, they do not show *how* cartels cause these effects, that is, they do not reveal the mechanisms through which cartels have those effects. Thus, to supplement the quantitative results I provide qualitative case studies that look at territories where cartels had previously not operated and experienced cartel intrusion and state capture following the government drug war.

However, before presenting these qualitative case studies, it is important to be explicit about what the role and purpose of the case studies are vis-à-vis the quantitative evidence already presented. While this may seem straightforward, it raises key questions about mixed-methods

research that remain contested.

Centrally, there are active debates about whether and how quantitative methods developed to estimate average causal effects that rely on cross-case comparisons and qualitative case studies that trace within-unit processes to conduct inference about mechanisms can be integrated (Lieberman 2005; Sommer Harrits 2011; Ahmed and Sil 2012; Goertz and Mahoney 2013; Seawright 2016; Gerring 2017; Goertz 2017; Beach and Pedersen 2019; Fairfield and Charman 2022). Not only are they very different methods with different practices and norms, but they appear to have different scientific foundations.

Quantitative causal inference methods now largely base their scientific foundations either on the potential outcomes (POs) framework (Neyman 1923; Rubin 1974) or causal graphs, specifically directed acyclic graphs (DAGs) (Wright 1928; Pearl 2009), both of which understand the world in probabilistic terms, that is, random variables (what Beach and Pedersen (2019) call ontological probabilism). Qualitative methods, the other hand, tend to rely on different scientific foundations that do not see the world in terms of random variables, but instead are based on static, invariant factors (what Beach and Pedersen (2019) call ontological determinism). In quantitative methods, a variable can take on a value or not for a given case. In qualitative methods, mechanism cannot sometimes occur and other times not for the same unit. In other words, qualitative methods do not understand or interpret causal mechanisms as being more or less likely to happen under some condition. Mechanisms are not probabilistic.

This epistemic difference is widely recognized (primarily by qualitative and mixed-methods scholars), but has yet to be resolved. Responses range from Beach and Pedersen (2019) and Seawright (2016), who fully acknowledge these ontological differences but argue that each conception of causality has its strengths and weaknesses, each can answer different types of questions, and therefore can complement each other when combined, to that of Fairfield and Charman (2022), who argue that these ontological differences mean that combining them in mixed-methods research is fundamentally wrong and should not be done (see pages 7-8).

This chapter contributes to this debate by proposing one way in which this apparent difference in scientific foundations can be resolved by integrating causal mechanisms into both the PO and DAG frameworks. Therefore, I argue that the PO and DAG frameworks can accommodate these two methodological approaches. The conclusion, then, is that these two methodological traditions are *not* incongruous and can be integrated into a single framework, and that this framework provides insight into the role of each method in a mixed-method study.

To do this, I build on Seawright (2016), who argues that quantitative research and qualitative methods share an underlying notion of causation and uses the PO framework informally to illustrate how qualitative methods can be used alongside quantitative methods. Yet, I go further than Seawright (2016) and than Beach and Pedersen (2019) by integrating causal mechanisms *into* the PO and DAG frameworks, thereby demonstrating that the DAG and PO frameworks can actually accommodate causal mechanisms and ontological determinism.

The purpose of this chapter is therefore to introduce theoretical foundations for integrating quantitative approaches that estimate causal effects and qualitative approaches that trace causal mechanisms. More generally, this chapter seeks to advance the theoretical foundations of mixed-method research that tests both causal effects and causal mechanisms.

In doing so, I provide a framework to understand how this dissertation seeks to integrate the quasi-experimental evidence of the previous chapter and evidence from the qualitative case studies presented in the following chapter, and clarify how each part contributes to each other in this multi-method dissertation.

7.1 Integrating Causal Inference and Causal Mechanisms

This section presents the standard PO and DAG frameworks and proceeds to show how causal mechanisms can be integrated into each.

7.1.1 Potential Outcomes and Causal Mechanisms

To begin, let us discuss the PO framework. In this framework, we have unit i, there are two possible treatment assignments, $T_i = 1$ is the treated and $T_i = 0$ is the control, so that each unit has two potential outcomes, $Y_i(T_i = 0)$ and $Y_i(T_i = 1)$, given whether they are the control or treated, respectively. The causal effect of the treatment for unit i is therefore $\theta_i = Y_i(1) - Y_i(0)$. However, for each unit, only one of the potential outcomes is realized, $Y_i = Y_i(T_i)$. The fundamental problem of causal inference is that we cannot observe both potential outcomes. This is also the foundation for our understanding of Y_i as a random variable.

If we assume that some mechanism(s) exist that causes θ_i, that is, that there is some force that leads T_i to cause a change in $Y_i(T_i)$, then we have identified where causal mechanisms fit into the potential outcome framework.

We can expand the PO framework to accommodate causal mechanisms by assuming that for unit i, $T_i = 1$ causes $Y_i(T_i = 1)$ through $M_i(T_i = 1)$, where $M_i(T_i = 1) \neq \varnothing$ is a non-empty set of mechanisms $M_i(T_i = 1) = [m_1, m_2, m_3, ..., m_n]$. The set, $M_i(T_i = 1)$, has at least one mechanism, m_1, and if there are more than one, the mechanisms need not be mutually exclusive. In other words, $T_i = 1$ can cause $Y_i(T_i = 1)$ through more than one mechanism, and maybe even through *a combination* of these mechanisms. For example, $M_i(T_i = 1)$ may cause $Y_i(T_i = 1)$ through m_1, or through $m_1 \wedge m_2$, or through $(m_1 \wedge m_2) \vee m_3$.[1] Importantly, $T_i = 0$ does not have any mechanisms since it is not causing anything, and therefore for $T_i = 0$, $M_i(T_i = 0) = 0$. This implies that mechanisms are only realized when $T_i = 1$.

To accommodate mechanisms, we need only slightly modify the PO notation: We have unit i, there are two possible treatment assignments, $T_i = 1$ is the treated and $T_i(0) = 0$ is the control, T_i causes a change in potential outcomes through M_i, so that each unit has two potential outcomes, $Y_i(M_i(T_i = 0))$ and $Y_i(M_i(T_i = 1))$, given whether they are the control or treated, respectively. The causal effect of the treatment for unit i is therefore $\theta_i = Y_i(M_i(1)) - Y_i(M_i(0))$.

[1] Here $\wedge$ means "and", while $\vee$ means "or".

Table 7.1: Potential outcomes and mechanistic homogeneity.

Unit	$Y(M(T=1)=1)$	$Y(M(T=0)=0)$	$\theta = Y(1)-Y(0)$	M
1	15	10	5	m_1
2	18	14	4	m_1
3	13	5	8	m_1
4	12	11	1	m_1
5	16	14	2	m_1

Table 7.2: Realized observed outcomes and mechanistic homogeneity.

Unit	$Y(M(T=1)=1)$	$Y(M(T=0)=0)$	$\theta = Y(1)-Y(0)$	M
1	?	10	?	none
2	18	?	?	m_1
3	13	?	?	m_1
4	?	11	?	none
5	16	?	?	m_1

However, for each unit, only one of the potential outcomes is realized, $Y_i = Y_i(M_i(T_i))$, depending on T_i, which in turn determines whether M_i is realized.

This new, slightly modified PO framework can explain how the realized potential outcome, Y_i, can be a random variable while M_i is realized every time $T_i = 1$ and not realized every time $T_i = 0$, making it static and invariable within each unit i. This also implies that the mechanisms, M_i, linking the treatment status, T_i, to Y_i are only present in the (1,1) cells—cases where the cause and outcome are both present.

A question that remains is whether M_i is the same across units $i = 1,...,n$ (mechanistic homogeneity), whether it varies across subsets of the units due to some contextual condition (mechanistic homogeneity within subgroups and mechanistic heterogeneity across subgroups),[2] or whether M_i is unit-specific (complete mechanistic heterogeneity). In the social sciences our theories most often tend to assume mechanistic homogeneity, though sometimes we develop more complex theories that assume mechanistic homogeneity within subset of units—for example, the effect of economic development on democratization varies by level of economic inequality (low,

[2]I follow Beach and Pedersen (2019) who define contextual conditions as factors that shape the way mechanisms work.

Table 7.3: Realized observed outcomes and mechanistic heterogeneity

Unit	$Y(M(T=1)=1)$	$Y(M(T=0)=0)$	$\theta = Y(1)-Y(0)$	M
1	?	10	?	none
2	18	?	?	$m_1 \wedge m_2$
3	13	?	?	m_1
4	?	11	?	none
5	16	?	?	$m_1 \wedge m_3$

medium and high). We certainly never assume complete mechanistic heterogeneity. Tables 7.1 and 7.2 illustrates mechanistic homogeneity and potential outcomes and mechanistic homogeneity and observed outcomes, respectively, using the framework introduced here. Additionally, Table 7.3 shows an example of mechanistic heterogeneity.

While the PO framework that incorporates causal mechanisms is presented here using a binary treatment condition, $T_i \in \{0,1\}$, the framework can be extended to non-binary treatment. Further, for simplicity, like the basic PO setup, I also assume no reverse causality or simultaneity, consistency, and no interference between units.

7.1.2 Causal Graphs and Causal Mechanisms

DAGs can also easily integrate causal mechanisms. I follow the work of Waldner (2015) in this sectio, who has advanced this idea. DAGs represent causal relationships between random variables with graphs. Figure 7.1 shows a simple DAG, with T denoting the treatment, Y the outcome of interest, and O an third observed variable. In DAGs, each node (circle) represents a random variable, while each edge (arrow) represents a causal effect from the variable where the edge originates to the variable the edge points to. In this instance we are interested in the causal relationship between T and Y, which is shown in blue in Figure 7.1. In the DAG literature, the main goal is identifying causal pathways from T and Y, by, for example, closing "back-door" pathways and avoiding collider bias. However, little attention has been given to the edge connecting these two variables.

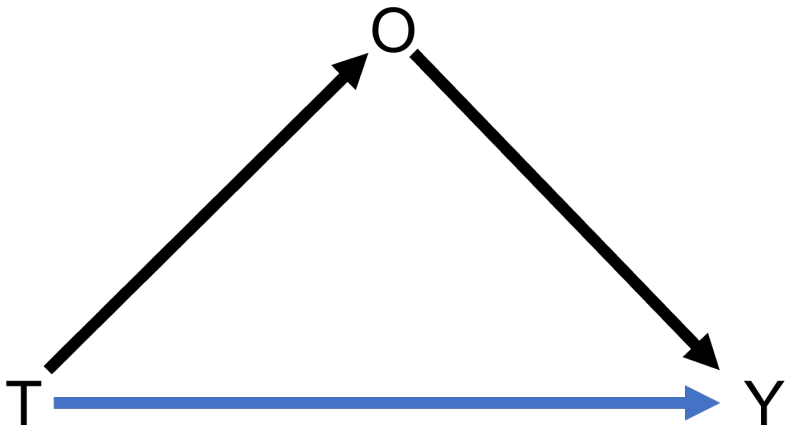


Figure 7.1: Example of simple directed acyclic graph showing causal relation of T on Y.

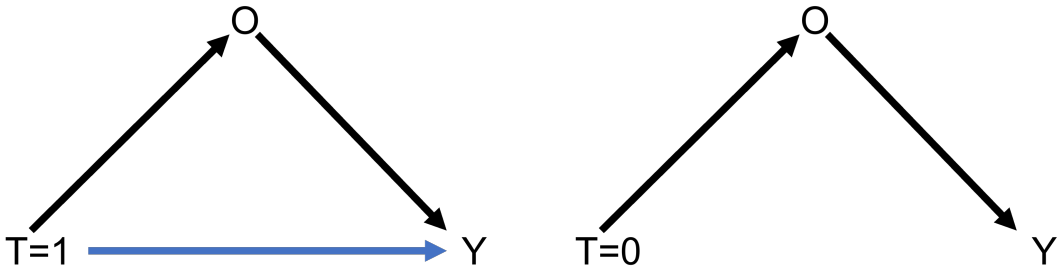


Figure 7.2: Example of (A) causal mechanism being present when treatment takes non-zero value, and (B) causal mechanism being absent when treatment takes value of zero.

To fit causal mechanisms into the DAG framework, I assume that some chain exists that leads T to have a causal effect on Y. In the DAG diagram, I take the causal mechanisms to be represented by the edges. To visually illustrate where causal mechanisms fit into DAGs, Figure 7.2 shows the causal mechanism (blue edge) being present when the treatment is non-zero and non-existent when the treatment takes a value of zero. This implies that the edge is not probabilistic—it is not a random variable. Instead, causal mechanisms exist when T is present and simply do not exist when T is absent, meaning that the edge (causal mechanism) connecting T to Y follows ontological determinism.

This understanding of DAGs also means that we should interpret the edge as the mecha-

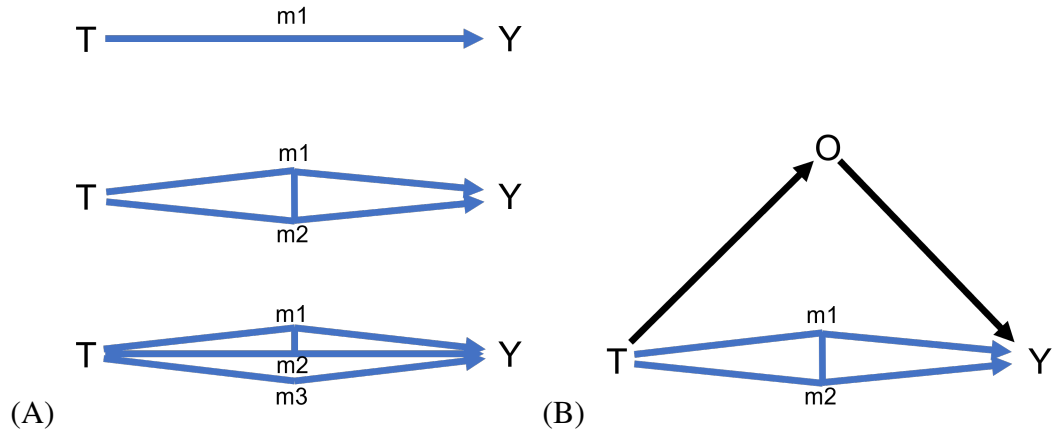


Figure 7.3: Example of (A) three different possible causal mechanisms connecting T to Y, and (B) fully defined causal graph including mechanisms.

nisms connecting T to Y, without which T has no causal effect on Y. Building on this, we can complicate causal mechanisms in DAGS. This is because while DAGs tend to depict the causal mechanisms linking T to Y as a singular edge, we can build on this to incorporate more complex causal mechanisms.

DAGs actually allow us to explore causal mechanisms in more detail, or at least visualize them better, than the PO framework and require us to be more explicit about our proposed theories. Figure 7.3 opens the "black box" of the edge connecting T to Y, with the left plot showing different possible causal mechanisms connecting these two variables. These represent, from top to bottom, T causing Y through m_1, through $m_1 \wedge m_2$, or through $(m_1 \wedge m_2) \vee m_3$.

Thus, a fully specified DAG should map not only causal effects but the causal mechanisms connecting the two main variables of interest, in this case T and Y. Plot (B) of Figure 7.3 shows an example of a simple DAG that identifies both the relationships between variables and the causal mechanisms theorized to be present. Note that this example assumes mechanistic homogeneity. To incorporate mechanistic heterogeneity one would have to specify the mechanisms present for different values of T or across contextual conditions.

7.2 Role of Quantitative Methods

In the previous chapter, I estimated the effect of cartel expansion on electoral competition and citizen well-being using an instrumental variables approach where I instrument cartel presence with the location of oil pipelines. This is due to the possibility that cartels chose to expand to certain political jurisdictions based on their pre-existing levels of political accountability and crime. Under this approach, I use quantitative methods to estimate the LATE.

The LATE is defined as the intention to treat (ITT) effect divided by the proportion of units that are treated when assigned to the treatment group (ITT_T). In this case, the ITT is the effect of a municipality having an oil pipeline, the instrument Z_i, on the realized potential outcome of interest Y_i, and the ITT_T is the proportion of municipalities with cartel presence T_i that have oil pipelines, Z_i.

Using the PO framework, the LATE is defined as:

$$LATE = \frac{ITT}{ITT_T} = \frac{E[Y_i(Z_i = 1)] - E[Y_i(Z_i = 0)]}{E[T_i(Z_i = 1)] - E[T_i(Z_i = 0)]} \tag{7.1}$$

Given the exclusion restriction and monotonicity assumptions, however, the LATE can be rewritten as:

$$LATE = E[Y_i(Z_i = 1, T_i = 1) - Y_i(Z_i = 0, T_i = 0) | T_i(Z_i = 1)] \tag{7.2}$$

This tells us the average treatment effect for the compliers (municipalities with oil pipelines and cartel presence). As scholars have shown, we can estimate this quantity with quantitative methods, which I do using the instrumental variables approach. This means that the role of the quantitative evidence provided in the earlier chapter is to estimate this causal relationship.

7.3 Role of Qualitative Methods

What, then, is the role of qualitative methods in a mixed-methods study of this type? To understand how qualitative methods and case studies can be integrated with quantitative methods, we need to break down Equation 7.2 using the new PO framework presented here that includes causal mechanisms. Equation 7.3 shows this modification:

$$LATE = E[Y_i(Z_i = 1, M_i(T_i = 1)) - Y_i(Z_i = 0, M_i(T_i = 0))|M_i(T_i(Z_i = 1))] \tag{7.3}$$

As defined earlier, $M_i(T_i = 1) \neq \varnothing$ is a non-empty set of mechanisms $M_i(T_i = 1) = [m_1, m_2, m_3, ..., m_n]$, while $M_i(T_i = 0) = \varnothing$ is an empty set. Thus, to understand *how* the compliers affect the outcome, we must look at $Y_i(Z_i = 1, M_i(T_i = 1))$ in Equation 7.3.

This implies the following: mechanisms are only present for compliers (units with *both* oil pipelines and cartel presence) *and* with the realized potential outcome $Y_i(Z_i = 1, M_i(T_i = 1))$ present. Therefore, using this framework, qualitative methods can help us understand how the LATE is realized by uncovering and tracing the set of mechanisms $M_i(T_i(Z_i = 1) = 1) = [m_1, m_2, m_3, ..., m_n]$.

7.4 Implications of Framework

The main contribution of this novel framework is the implication that quantitative methods used to estimate causal effects and qualitative methods used to trace causal mechanisms can be integrated in a single study in a consistent and logical manner. It goes even further, through, by showing how they can be integrated and what each method contributes. It also has important implications for how we think about counterfactuals for causal mechanisms, selecting cases to test or investigate causal mechanisms, and identifying mechanistic homogeneity or heterogeneity.

7.4.1 Counterfactuals for Causal Mechanisms

Causal mechanisms are realized phenomenon in the real world that we should be able to trace when the cause and outcome are both present in unit i, not random variables that are only sometimes realized. Interestingly, this means that counterfactuals for causal effects and causal mechanisms differ. Counterfactuals for causal effects in both the PO and DAG frameworks are unrealized potential outcomes, but because mechanisms only exist when $T = 1$ and not when $T = 0$, the counterfactual for a theorized mechanism is a rival mechanism, *not* unrealized counterfactuals. This means that the fundamental problem of causal inference for causal effects is not a problem for causal mechanisms. We can test rival mechanisms in the real world because mechanisms are real-world phenomenon. Therefore, for causal mechanisms, the main challenge is (1) identifying the causal mechanism(s) present and (2) testing for causal homogeneity.

This implies that when testing theories deductively or when generating theories inductively, it is essential to be explicit about and seriously consider rival mechanisms and mechanistic heterogeneity when collecting evidence. This also means that learning about causal mechanisms is different than learning about causal effects, and thus the approaches differ. Causal effects require cross-unit comparisons due to the counterfactual problem; causal mechanisms require within-unit analysis to isolate mechanisms.

7.4.2 Case Selection

This framework has important implications for case selection for process tracing following a causal inference analysis. Centrally, it implies that it does not matter if the cause affects outcome only a little, or if the cause affects the outcome a lot—if the cause is affecting the outcome then the mechanism connecting them is present. What might be true is that given the value of T or Y, the mechanisms linking them might be easier or harder to detect in the real world.

Therefore, when selecting cases in this case, any unit with $T_i = 1$ and $\theta_i \neq 0$ is appropriate

for testing mechanisms or generating theories. This is consistent with selection criteria (Seawright 2016) that advocate for selecting cases that are extreme in the value of the independent variable, and with the selection criteria that argues for selecting (1,1) cases. On the other hand, this contrasts selection methods that advocate for the cases selected to be representative of some broader population, usually those close to the regression line, a selection criterion that is largely based on frequentist logic that thinks about causal effects.

In the case of this study, this implies selecting cases for qualitative analysis within the compliers $T_i(Z_i = 1) = 1$ and where the outcome Y_i is present. In other words, selecting municipalities with oil pipelines, cartel presence, and state capture.

7.4.3 Mechanistic Homogeneity

Another important implication of this framework is that we usually want to test for mechanistic homogeneity either across all units or some subset. That is, we do not believe in complete mechanistic heterogeneity where every unit, despite having the same treatment, has a different mechanism connecting T to Y. The simplest assumption is mechanistic homogeneity where we want to test whether our proposed mechanism is present in all our cases.

Another common assumption is that there is some mechanistic heterogeneity but there is mechanistic homogeneity within important subsets of the units. For example, if we believe that state capture differs based on whether local governments have low or high state capacity.

This introduces the crucial concept of contextual conditions. contextual conditions here follow the definition in the process tracing literature (Beach and Pedersen 2019), which defines it as any factor that affects how a mechanism operates in the real world within a unit. In the example above, state capacity would be a theorized contextual conditions. Therefore, identifying the central contextual conditions given our theory, cause, and outcome, is also crucial for testing for causal homogeneity or heterogeneity.

7.5 Conclusion

In this chapter I presented the methodological foundation of the mixed-method research design used in this dissertation. Specifically, I draw on the PO and DAG frameworks and propose a modification that integrates causal mechanisms. Using this novel framework I show how quantitative methods used to estimate causal effects and qualitative methods used to trace causal mechanisms can be integrated in a mixed-methods study. I then discuss the implications of the framework I propose for thinking about the counterfactual of causal mechanisms, case selection strategies, and mechanistic homogeneity. This theoretical framework for integrating quantitative and qualitative evidence in mixed-methods research is central to this dissertation, and is key for the following chapter where I present the qualitative case studies.

Chapter 8

Case Studies: State Capture in New Territories

In a previous chapter I presented evidence that cartels diversifying into oil theft pushed them to expand their presence geographically, and specifically, to strategically target that expansion to territories with oil pipelines. I then provided statistical evidence that cartels entering political jurisdictions with oil pipelines resulted in reduced local democratic accountability and worsened citizen well-being. However, quantitative measures only allow us to statistically estimate the effects on specific outcomes. The effects estimated in Chapter 6, I have argued, are just some of the important observable implications of cartels actively attempting to capture local state actors in the political jurisdiction they have recently entered to protect their new activities.

This chapter turns to the local and presents in-depth qualitative case studies of municipalities with oil pipelines that did not have cartel presence before the government drug war but experienced cartel intrusion soon after. By examining these municipalities, I seek to trace how cartels establish themselves in these places and the dynamics of state capture. These case studies are based on extensive qualitative research, fieldwork, and interviews with local actors.[1]

[1] Fieldwork for this study was approved by the University of California, San Diego IRB Project #210532S.

In the following sections, I summarize the objective of the case studies for the dissertation given the theoretical framework, quantitative evidence provided in previous chapters, and the mixed-methods structure presented in the previous chapter. Following this, I present the logic behind the case selection process and discuss how I apply it to this project. I then explain the data collection process, its challenges and limitations. Finally, I provide two in-depth case studies of two municipalities in the central state of Guanajuato, in which I detail how cartels entered and began capturing local state actors in order to establish their operations in these territories.

8.1 Objective of Case Studies

In Chapter 6, I estimated the LATE of cartel expansion on local democratic accountability and citizen well-being using an instrumental variables approach where I instrument cartel presence with the location of oil pipelines. This means that the role of the quantitative evidence provided in the earlier chapter is to estimate this causal relationship. What, then, is the role of qualitative methods in a mixed-methods study of this type? In Chapter 7, I argued that qualitative methods, and specifically within-unit methods to trace mechanisms, can help us understand how the LATE is realized. In other words, qualitative methods here are intended to show *how* cartels cause these effects, that is, to reveal the mechanisms through which cartels have those effects. Thus, to supplement the quantitative results I provide qualitative case studies that look at territories where cartels had previously not operated and experienced cartel intrusion and state capture following the government drug war.

8.2 Case Selection

8.2.1 Theoretical Logic

In this study, case selection is very important given that only a handful of cases can be studied through qualitative case studied. The case selection strategy here follows directly from the case selection logic presented in the previous chapter on integrating causal inference methods with qualitative case studies to study mechanisms. In short, typical cases should be chosen, that is, those where both the causal factor (in this case, cartel presence *in territories with oil pipelines*) and the outcome (in this case, state capture) are present. This is because both X (cause) and Y (outcome) need to be present in the case that is chosen for it to be possible to investigate the hypothesized mechanisms linking X to Y.

Second, we must map the population of typical cases to understand how these cases compare to one another, allowing us to select the appropriate cases. Beach and Pedersen (2019) argue that case selection should be based on criteria that allow us to generalize results from a within-case study to a broader population. This means selecting cases in such a manner that mechanistic homogeneity can be tested. To do this, the authors propose mapping the population of typical cases based on (i) causes, (ii) outcomes, and (iii) contextual conditions. Contextual conditions are defined as "any factor that could impact how a process works," that is, factors that may impact how and which causal mechanisms function withing a case (Beach and Pedersen 2019, 91).

As the authors state, "[t]he goal of mapping a population for process-tracing research is to determine similarities and differences that may impact what mechanism operates, enabling us to select appropriate cases and generalize our findings about mechanisms" (Beach and Pedersen 2019, 95). By mapping the population, we can compare the cases based on contextual conditions that may impact the causal process and determine how similar or dissimilar they are from each other. This level of similarity is calculated by counting the number of conditions shared by cases.

The reasoning behind this mapping is that finding the causal mechanism in one case does not automatically allow one to generalize to other cases with different contextual conditions. Even finding the theorized mechanism in "least likely" cases does not mean we can make inferences about other cases, even "most likely" cases, with different contextual conditions. Rather, we would ideally look to conduct process-tracing on a set of cases with different contextual conditions so that we can, case by case, build confidence about the generalizability of the causal mechanisms and the conditions necessary for them to function. This process allows researchers to identify which parts of the causal process are case-specific and thus nonsystematic, and which are systematic and thus generalizable.

The most challenging part of selecting cases in this study is determining whether, for each case, organized crime has captured government officials *prior to* collecting data and conducting process tracing. This issue is exacerbated due to the illicit and often unobservable nature of the outcome and to the mere number of units requiring investigation for categorization: There are 313 municipalities with oil pipelines, most of which had virtually no organized crime presence prior to 2007, and 13 years to cover (2006-2018) for each one.

When there is uncertainty over the outcome, (Beach and Pedersen 2019, 103) recommend that scholars should start with cases where experts agree that the outcome is present. Given the context in Mexico and existing research arguing that criminal organizations cannot operate without some degree of state protection, without knowing specific cases, it was the author's prior that if the cause was present (cartel presence), there was a very high likelihood that the outcome (state capture) would be too. This allowed me to focus on identifying cases with the cause present and base case selection on contextual conditions and practical limitation.

Identifying relevant contextual conditions also proves challenging given that the literature on criminal capture is still in its infancy, especially research that explores this phenomenon outside of a criminal organization's historical stronghold. First, there is a dearth of accumulated academic knowledge about the subject. Only a handful of studies exist that investigate government capture

by organized crime. Moreover, government capture in territories with new organized crime presence is a subject that has yet to be studied in a systematic manner.[2] This leaves this study in somewhat unexplored territory and in risk of omitting relevant contextual conditions that are unidentified during the selection process.

Nevertheless, state capacity (Gambetta 1993; Bandiera 2003; Buonanno et al. 2015; Dimico et al. 2017; Acemoglu et al. 2020), coordination across levels of government (Ríos 2015; Trejo and Ley 2016; Durán-Martínez 2017; Alcocer 2023a), and the capacity of criminal organizations (Guerrero-Gutiérrez 2011), stand out as important contextual conditions that may shape how criminal organizations interact with the state. First, low state capacity has traditionally been seen as a driver or facilitator for the emergence and existence of mafias. Where the state is absent or weak, criminal organizations can thrive. Where the state is strong, criminal organizations cannot operate. Scholars of Latin America have more recently highlighted that this traditional view is an overly simplistic view of the phenomenon (Arias 2006; Trejo and Ley 2020), but state capacity could, nevertheless, impact *how* criminal organizations interact with the state. Second, intergovernmental coordination has been shown to matter for where and how effectively the state can combat organized crime. In the context of Mexico, this has been explored through intergovernmental party politics, where higher level cop-partisans either help lower level co-partisans combat criminal organizations or refuse to protect lower level politicians from rival parties. The result being that local politicians sharing political parties with higher level politicians (state or federal) can help them combat criminal organizations. Third, a result of cartel fragmentation in Mexico was that a handful of large cartels continued operating, but dozens of smaller cartels also emerged. These smaller cartels continue to be powerful criminal organizations but are more geographically restricted and have less capacity than the larger groups. This could mean that state capture works differently for small versus large cartels.

[2]With notable exceptions of Varese (2006) and Dipoppa (2021). However, Dipoppa (2021) finds that the Italian mafia exploited migrants from Southern Italy to expand to Northern Italy by controlling labor (migrants) during a construction boom in the North and exploiting their historical connections with one political party that operated in the North that helped them expand. This is fundamentally different from the Mexico context.

To measure the state strength/weakness of each municipality in Mexico for the purposes of case selection, I classify each one as either urban or rural based on their population, with urban municipalities having higher state capacity (higher budgets, more economic activity, more police officers, prosecutors, judges, courts, etc.) than rural municipalities. I follow existing studies that measure coordination across levels of government as a mayor sharing political parties with the governor or the president. To measure the capacity of cartels I adopt the typology presented by Guerrero-Gutiérrez (2011), which categorizes cartels into four groups: national, tax collecting, regional, and local. Practical considerations come into play here as well, particularly the geographic limitations of needing to conduct in-depth fieldwork in these places with time and budgetary constraints.

8.2.2 Selection Process

Since the purpose of this study is to test a novel theory against competing theories, I want to select cases where the leading existing explanations are most likely to be present that also give me variation in the contextual conditions.

One alternative explanation is that states are autonomous and tolerate illicit activities in return for benefits (Snyder and Duran-Martinez 2009; Arias 2006, 2017; Lessing 2017; De Feo and De Luca 2017; Di Cataldo and Mastrorocco 2021; Dipoppa 2021; Bullock 2021). Under this explanation, the state has the clear upper hand over criminal organizations but decides not to dismantle them as they prove useful to those in power. This explanation means focusing on territories where the state seems to have an upper hand over cartels. A second alternative explanation is that cartels infiltrate local governments "from above" through violence (Daniele and Dipoppa 2017; Trejo and Ley 2020), which narrows the selection to territories where politicians have been threatened, attacked or killed by cartels. A third alternative explanation is that cartels capture enforcement agencies cracking down on them (Arias 2006; Lessing 2017; Auyero and Sobering 2019), which requires us to focus on jurisdictions where public security personnel have

been threatened, attacked, or killed. Moreover, due to geographic constraints, I focus on finding geographically proximate municipalities that fit the selection criteria.

After preliminary investigation, I found that the state of Guanajuato offers plenty of cases across space and time that meet the different case selection criteria while also meeting the research design prerequisites. First, it includes plenty of cases where the cause (oil pipelines and new cartel presence) is present. 18 of Guanajuato's 46 municipalities have oil pipelines, with only one having cartel presence before 2007 but with all having cartel presence by 2017.

Second, Guanajuato also offers cases that favor alternative explanations vis-à-vis my own. For one, (Trejo and Ley 2020, Ch. 6) use Guanajuato as a case where the federal and state governments were able to successfully protect local municipal governments from cartel infiltration between 2006 and 2012. This gives these local governments an upper hand over cartels, giving them the ability to seek cartels and establish quid pro quo deals (alternative explanation 1). More recently, however, Guanajuato has experienced a wave of violence against politicians, hinting that perhaps cartels gained the upper hand and began capturing local governments from above (alternative explanation 2). Guanajuato also now suffers from frequent attacks against public security personnel, including local and state police forces (alternative explanation 3).

Third, in addition to considering alternative explanations, Guanajuato also offers variation among the three main contextual conditions identified. Municipalities like León, Salamanca, Villagran, Cortazar, Apaseo el Alto, among others, have, at times, had mayors from political parties that differ from the party in power at the state and federal level. Moreover, it is composed of both urban and rural municipalities. And lastly, it also includes municipalities controlled by a large national cartel (Cartel Jalisco Nueva Generacion) and a smaller regional cartel (Cartel Santa Rosa de Lima).

Of the 18 municipalities with oil pipelines, two cases were initially selected for in-depth investigation given the factors outlines above: Salamanca and León. In each of the case studies, I explain how they fit into the selection criteria. Figure 8.1 shows where Guanajuato is within

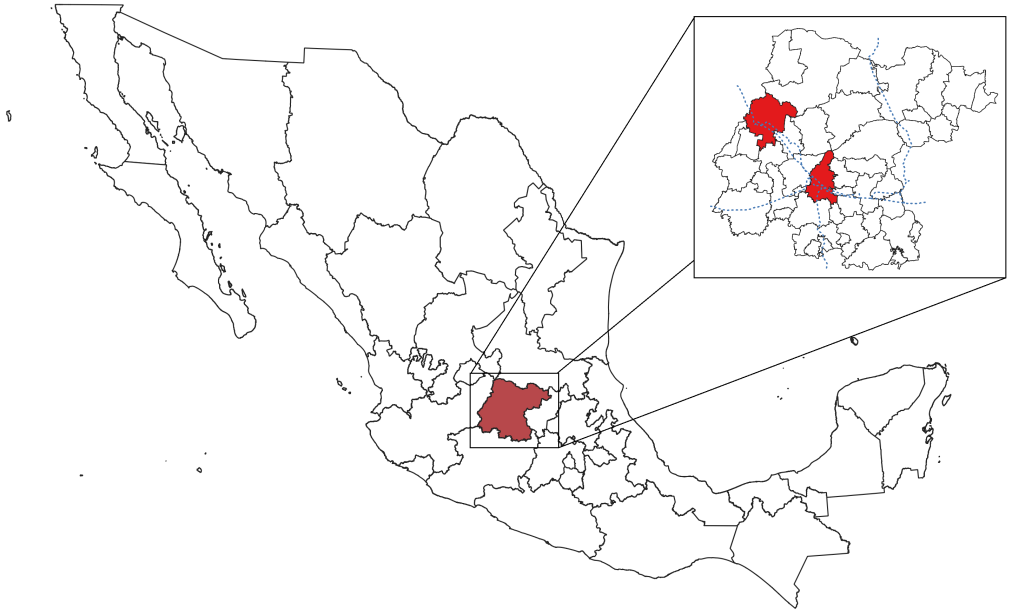


Figure 8.1: Qualitative case studies: Location of Guanajuato within Mexico and of Salamanca and León within Guanajuato. Dotted line denotes the location of oil pipelines within Guanajuato.

Mexico and where Salamanca and León are located within Guanajuato.

8.3 Data Collection

Data collected for this project comes from various sources. First, extensive qualitative research was conducted to understand the history of cartels in the state. Through these efforts I produced a list of the population of cartels that operated in Guanajuato at some point between 2000 and 2021, which ended up including 13 different cartels. Using this list, a hand-coded dataset of cartel presence in Guanajuato by year per municipality from 2000 to 2021 was constructed using government and expert reports, primary and secondary online sources, and data collected during fieldwork, including interviews with local actors. This effort also involved creating narratives for each cartel, tracking their histories, leaders, trajectories, relations with other cartels, and activities through time. Fieldwork for this study was approved by the University of California, San Diego IRB Project #210532S.

A systematic data collection effort was also undertaken to identify every public security official (members of the municipal or state public security agencies and Attorney General's Office) assassinated during this time period, as well as every elected politician, party member, and civil servant assassinated. All news of any government agent being linked to a cartel was also collected and processed.

For each municipality selected as a case study, additional systematic data collection efforts were also done to gather all relevant news relating to local politicians, civil servants, public security, and cartels. This included incidents like shootouts, cartel attacks, shifts in policies, possible threats, arrests of cartel members, politician links with cartels, and police links with cartels, among others.

Finally, these data collection efforts were complemented by fieldwork and interviews with, primarily, municipal-level government officials, but also with state-level government officials, local academics, reporters, party members, and a local security analyst. To protect the confidentiality of those interviewed, I use gender neutral terms (they/them/their) when discussing statements made by individuals interviewed.

It is very important to note that the data and evidence presented here is not definitive, and in many instances is hearsay, circumstantial, or uncorroborated by hard evidence. This study is not meant as a judicial or investigative piece meant to accuse or single out individuals, and does not pass evidentiary standards set in most courtrooms. Instead, the case studies are used to understand the general dynamics between cartels and the state in a more systematic and abstract manner, albeit based on empirical evidence. As such, evidence discussed in the case studies should not be taken as definitive evidence of "the truth."

8.4 Guanajuato and Cartel Intrusion

Guanajuato is a state in central Mexico, with a population of over 6.1 million according to the 2020 census, and is divided into 46 municipalities. Guanajuato as a state is one of the most economically developed in Mexico. According to a recent report by INEGI, between 2003 and 2014, 30.6% of the state's economy was in the manufacturing industry, nearly double the national average. In 2014, Guanajuato was the state with the seventh largest GDP (out of 31 plus Mexico City), and between 2003 and 2014 the GDP grew by a yearly average of 3.43 (INEGI 2016).

Politically, the state of Guanajuato has a long history as a bastion of the center-right PAN party. Guanajuato was the second state in Mexico to rally against the PRI and elect an opposition PAN governor in 1991.[3] Since then, Guanajuato has only elected governors from the PAN party, and over half of its municipalities have continuously stayed under a PAN mayor. Even following the 2018 Morena wave, only five of Guanajuato elected a mayor from Morena, and only three in 2021.

Guanajuato had historically spared itself from drug cartels operating within its territory, as it is not along any important drug trafficking routes, drugs are not cultivated or produced there, and it is not close the US-Mexico border. Prior to 2008, only the Sinaloa Cartel (herein CDS) and the Beltran Leyva Organization had minimal presence in the cities of León and San Miguel de Allende, respectively. Yet, this presence was not operational presence—presence for the purpose of conducting criminal activities—as the CDS's presence in León was due to the families of some its important leaders living there, and the Beltran Leyva Organization's presence in San Miguel was to launder money through investments and for the luxurious vacations of its leaders.

However, following the government crackdown starting in December 2006, the Zetas and the Familia Michoacana (herein LFM) Cartels began entering the state through small cells as they extended their operations from neighboring states. Specifically, these two cartels extended their small-scale predatory crimes into Guanajuato, most importantly extortion, kidnapping, and local

[3]The first was Baja California, who elected a PAN governor in 1989.

drug dealing. These small-scale operations were so minimal that even by 2009, when violence in other regions of the country was exploding, the state was so peaceful that the national leader of the PAN party claimed that if Mexico wanted to improve its security situation "it should start by 'Guanajuatizing' the country" (Ramos 2020).

Around 2009 there was an important change in the criminal underworld in Guanajuato: cartels began entering the hydrocarbon market. This entails stealing refined oil products, primarily gasoline and diesel, from underground pipelines, and selling it to local markets, including to individuals, local businesses, and large companies. cartels quickly found this market to be extremely lucrative, as profits and profit margins were significantly higher than other crimes, other than drug trafficking. This new illicit market began attracting cartels to territories with underground pipelines since those territories, many of them previously insignificant to cartels, became incredibly valuable.

Unfortunately for Guanajuato, 18 of its 46 municipalities have underground pipelines. Suddenly, a state that had been praised for its economic development and peacefulness, became an invaluable territory for cartels. While some oil theft by the Zetas and Knights Templar (herein CT)[4] occurred in the state of Guanajuato from 2011 to 2014, it was minimal or at least manageable by local authorities. However, this changed with the growth of the Cartel Jalisco Nueva Generacion (herein CJNG) in Guanajuato, and the emergence and growth of the local Cartel Santa Rosa de Lima (herein CSRL), two groups that would soon commence a deadly war.

To give some idea about the economic incentives driving these cartels to fight for control of Guanajuato, internal reports by the Federal Government estimate that during its heyday, the CSRL—which never controlled all municipalities with pipelines in Guanajuato—stole 40 to 50 gas trucks[5] per day, which were valued at an estimated $1 to $1.5 million US Dollars (De Mauleon 2019; Flores Martinez 2020). This translates to the market being worth between $365 and $547 million US Dollars *per year*.

[4] An organization formed by former LFM leaders in early 2011 that took over most LFM operations in Guanajuato

[5] Pemex gas trucks range in capacity from 30 to 70 thousand liters.

In early 2015, the last remaining leaders of the Zetas and CT were captured, fragmenting these groups into smaller and weaker remnant groups. This severely weakened their cells operating in Guanajuato, and allowed the proliferation of CJNG and CSRL in the state. Between 2015 and 2017, both groups expanded their territories in the state and strengthened their capabilities, CJNG in the west of the state in municipalities bordering its home state of Jalisco, and CSRL in the south of the state in municipalities along pipelines. In 2017, as CJNG was expanding into CSRL territories, CSRL recorded and disseminated a video online where El Marro, leader of CSRL, declares war against CJNG.

This war between CJNG and CSRL had drastic consequences for the state of Guanajuato. Violence exploded as all out war over oil theft was waged. This marked a critical shift that not only saw criminal violence increase, but also violence against police, the military, and politicians. As early 2023, this war continues, with CJNG now having the upper hand over CSRL.

8.4.1 Case 1: Salamanca

Salamanca is an urban municipality with a population of just over 270,000 according to the 2020 census. In the 1997 elections, the first non-PRI mayor was elected from the PAN party. Until the elections of 2018 when a Morena candidate won, all mayors since 1998 had been from the PAN party. This had allowed the PAN to build strong vertical connections between state and municipal governments.

In 1950, PEMEX inaugurated a refinery in the city and quickly became central for the local economy. The petrochemical industry has remained the core of Salamanca's economy since. However, other manufacturing industries are growing, for example, Mazda invested $770 million USD to open a manufacturing plant in Salamanca, which was inaugurated in 2014 (Negrete 2014).

Oil theft had been occurring for decades in Salamanca, though it was historically perpetrated by Pemex employees within the refinery. This type of oil theft primarily included lower-level Pemex employees stealing refined oil products like gasoline and diesel using tanker

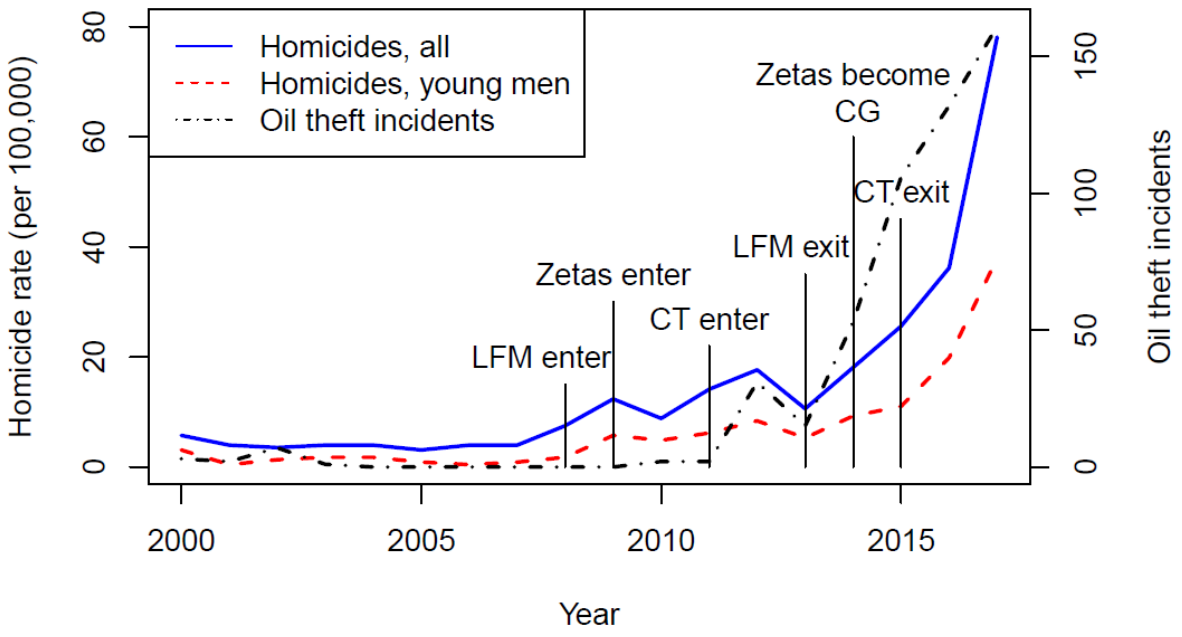


Figure 8.2: Homicide rates, number of oil theft incidents, and cartel entry and exit in Salamanca, 2000-2017. LFM = La Familia Michoacana, Zetas = Zetas, CT = Caballeros Templarios, CG = Cartel del Guanajuato/Cartel Santa Rosa de Lima. Data on homicides from INEGI. Data on oil theft incidents from Pemex.

trucks. This began to slowly change around 2009. There are two different versions, both of which could have happened simultaneously. First, in an interview, a local security analyst stated that around 2009, Pemex employees began to hire criminals (members of the Zetas) to help them steal, transport, store and sell the stolen oil products. However, as these criminals gained power, they eventually took the business for themselves and imposed themselves over the Pemex employees. The second account is that cartels were the ones that independently began seeking to enter the oil theft market by capturing Pemex employees. Either way, this marked an important change for Salamanca.

Here I present the narrative of the Salamanca case study separated by municipal administrations in chronological order, with Figure 8.2 showing a summary of the events related to cartels, violence, and oil theft.

2003-2006 Municipal Government

In an interview, the director of municipal public security that served between 2003 and 2005 said that during his time, there was no organized crime, with the biggest issues being auto parts theft and family disputes. At that time, they had never heard of "huachicol,"[6] and major crimes included occasional small-scale marijuana offenses and on rare occasion, small-scale cocaine offenses.

2006-2009 Municipal Government

This all changed starting in 2008. The first evidence of cartel presence in Salamanca is in 2008 when a cell of LFM entered the municipality and began operating there. Soon after, in 2009, it was clear that a cell from the Zetas had also entered and began operating in the municipality. These relatively small but powerful cells operated primarily in extortion, drug dealing, and kidnapping for ransom.

In an interview, a member of the municipal council that served from 2006 to 2009 said that during their time on the municipal government public security topics were not covered in depth since there were no issues of organized crime. In an interview, a high-level civil servant in the municipality's public security agency from 2008 and 2009 said that during his time cartels had not infiltrated police yet. It was during his time as a high-level civil servant that state and federal authorities began to inform him that cartel cells were entering Salamanca, but since his agency did not have investigative capacities he only knew this general information he received. However, by 2009 he began receiving phone calls with death threats against him and his family from the Zetas, which pushed him to leave the public security agency out of fear.

2009-2012 Municipal Government

Things quickly worsened to the extent that in 2009, the newly elected municipal government created a public security commission whose job explicitly included topics related to organized crime. A high-level civil servant that worked for the municipal government between 2009 and 2011 said in an interview that by 2010 they clearly remember starting to hear about

[6]Term used to describe oil theft by non-state actors.

links between municipal civil servants and cartels. As many other interviewed, they stated that when they heard about these relations they did not ask for details out of fear.

In 2010, Salamanca experienced the first three assassinations of police officers by cartels. In February, two municipal police officers were killed during a shootout with Zetas members. In May, a civil servant from the state's Attorney General's Office assigned to Salamanca was assassinated in his home alongside his wife.

This is around the time when oil theft by cartels began to increase in Salamanca, especially by the Zetas cell. In early 2011, LFM fragmented, and the CT took over much of the organization, though LFM continued operating in a much smaller and weaker state. Remnants of LFM continued operating in Salamanca until 2013, but the CT cell took over most operations from LFM in Salamanca. Around 2011, CT also entered the oil theft market in Guanajuato. In December 2011, members of CT were arrested in Salamanca in various safe houses, where authorities also found municipal police officer uniforms, which raised suspicions about possible collusion with certain police officers.

Increasing involvement of cartels in oil theft gave them access to an extremely lucrative market that allowed these groups to begin amassing more capacity than they previously had. These cartels also began intensifying their efforts to capture Pemex employees in their efforts to increase their involvement in the oil theft business. In July 2012, the head of security for the refinery in Salamanca was assassinated in public by a group of armed men outside of a travel agency after getting in his car. Authorities reportedly found 25 bullet casings next to his vehicle, clearly implicating organized crime. In December of that same year, two additional Pemex employees were assassinated, allegedly by members of a cartel. In an interview, a security analyst from Guanajuato claimed that these crimes were perpetrated by the Zetas cell that would later become known as CSRL.

2012-2015 Municipal Government

In 2012, a new municipal government was elected. In an interview with an individual

with direct knowledge of the event, soon after the new mayor took office, he received a phone call from an individual claiming to be a member of LFM, who threatened the mayor. The mayor had to change his phone number and began taking more security precautions.

A high-level civil servant in the municipal public security agency that served from 2012 to 2015 stated that they very quickly realized that certain police officers in the agency were working with cartels, particularly when it came to the oil theft business. They recounted that two weeks after entering office in October 2012, two police officers were found along the oil pipelines with members of cartels, allegedly taking bribes from them. They also recalled that about the same time, they were told that a high-raking member of the public security agency had lunch with a local cartel leader ("lider huachicolero"), though soon after they failed their polygraph evaluation and were kicked out of the agency. They also recounted how they were later able to determine that another police officer was re-routing patrols during his shift so that the police would not enter certain places when the cartel he was working with was extracting oil from the pipelines. In 2014, a high-level civil servant in the public security agency demanded that this specific police officer be promoted, which is when they investigated and realized that high-level civil servants in the public security agency were also involved with cartels. The police officer was not promoted, and was assassinated by a cartel in 2018.

In another incident in January 2014, a police officer was murdered after attending a call in a neighborhood in Salamanca. In the interview, the high-level civil servant in the municipal public security agency stated that after investigation, it became clear that this police officer was involved with cartels and oil theft activities. In an interview with a member of the municipal council, this individual added that the investigation revealed that the brother of this police officer was an active member of a CO.

A member of the 2012-2015 municipal council working directly with the public security agency independently corroborated these accounts. Adding that throughout their term in office

they regularly checked the results of evaluations performed on individual police officers,[7] many of which could not explain major sources of income (for example, suddenly having brand new luxury cars or houses in wealthy neighborhoods) and/or failed the polygraph test. While they could not directly link many to cartels and oil theft, they "knew" that this was the only plausible explanation.

In 2014 there was also a major shift in the criminal underworld: a Zetas cell that operated in several municipalities in and around Salamanca became independent and began calling themselves "Cartel de Guanajuato" and later "Cartel Santa Rosa de Lima" (CSRL). The high-level civil servant in the municipal public security agency recalled that it was around 2014-2015 that they started hearing about the "Cartel de Guanajuato," which would later adopt the name CSRL. CSRL was a Zetas cell that specialized in oil theft, an activity that allowed them to become independent from their "parent" CO, the Zetas Cartel. During this time, the high-level civil servant in the municipal public security agency stated that they used to deal with oil theft events about once a week.

During this time, a high-level civil servant in the municipal public security agency and the mayor began coordinating operations against oil theft with the military. In August 2014, the mayor's bodyguard, a municipal police officer, who was assigned to protect the mayor's family home went missing while on duty. The bodyguard was found assassinated three days later in his car with a gunshot wound to the head. According to the high-level civil servant in the municipal public security agency, this event was a message, "'calm down or we come for you, for now we kill your bodyguard,' so we reduced [the operations] to the minimum, we stopped looking for huachicol."[8]

At the same time, three separate individuals that were interviewed, two co-partisans with the mayor that held positions in the local government, independently stated that during the 2012-2015 administration, high-level civil servants in the local government were involved with

[7]These checks, called "Evaluaciones de Control de Confianza," which translates directly as Trust Control Evaluations, involve a psychological screening, toxicological exam, background check, and a polygraph test.

[8]Quote translated by author.

cartels, presumably CSRL, including a civil servant in the treasury office. One of the interviewees provided the names of four high-level civil servants closely linked with a cartel and oil theft activities and described their sudden unexplained enrichment. Two of these interviewees, in addition to another co-partisan civil servant that worked for the state's Attorney General's Office, claimed in interviews that the mayor was also involved with "huachicoleros," with the other interviewee saying that they wanted to give the mayor the benefit of the doubt, and stated that the mayor was not directly working with a cartel, but rather indirectly through an understanding that took the form of, "let us work and we let you work."[9]

2015-2018 Municipal Government

As noted previously, in early 2015 both CT and the Zetas fragmented and were severely weakened in Guanajuato. This allowed CSRL to grow, expand, and strengthen its hold over central and southern Guanajuato, including Salamanca. This emboldened CSRL. Between 2016 and 2017, seven police officers were murdered by cartels in Salamanca alone, presumably CSRL. This included the director of the municipal police agency, who was killed in a public road along with another police officer, with a group of armed men shooting over 60 bullets at the police chief.

A particularly egregious event occurred in December 2016 when two police officers were assassinated and their bodies calcined. During an interview with a high-level civil servant working for the municipal government at the time, they claimed that it was determined that the two murdered police officers detected a tanker truck carrying stolen gasoline, other police officers arrived at the scene in a patrol car and proceeded to kidnap and kill the two police officers that stopped the tanker truck. In other words, captured police officers assassinated their own colleagues to protect a cartel and their oil theft operations.

In an interview, a high-level civil servant working in the office of fiscal policy and control for the municipal government between 2015 and 2018 stated that there was evidence that both police officers and high-ranking members of the municipal police agency were involved with

[9]Direct quote translated by author.

cartels. In interviews, a Pemex engineer working at the refinery since 2011 and a PAN civil servant in the municipal government that served from 2018 and 2021 both claimed that during the 2015-2018 administration, there was an explicit understanding between the municipal government and the CSRL.

In 2017, evidence suggesting that CJNG began extending its operations to Salamanca began to appear, and in August 2018, CJNG published a video online where a group of uniformed armed men with "CJNG" printed on their tactical vests formally announced their arrival to Salamanca. In the video, the CJNG members also single out CSRL and its leader, and state their intention of "exterminating" them.

This led to the CSRL and CJNG competing with each other over government capture in Salamanca, which was aggravated by the 2018 local elections. Allegedly, given the ties that CSRL had been able to build with certain members of the local PAN party machine, CJNG made agreements with opposition candidates. In an interview with a PAN candidate who was running for a spot in the municipal government, they recalled how during a campaigning event in a local market where they were with the PAN mayoral candidate, a man approached the mayoral candidate, shook his hand, and said "f*ck your mother, from El Mencho [leader of CJNG]."[10] The mayoral candidate left immediately and in once in the car told the interviewee that he was done and did not want to continue as mayoral candidate. A few weeks later, on June 1, 2018, exactly one month before the elections, six municipal police officers at a checkpoint were ambushed and killed by armed men in broad daylight. According to various individuals interviewed, this event marked the moment they realized the PAN would lose the election, which indeed they did to the candidate from the Morena party.

2018-2021 Municipal Government

Losing its high-level state capture made CSRL vulnerable and allowed CJNG to grow its presence and operations in Salamanca. The violence against police officers and its links

[10]Translated by author: "Chinga tu madre, de parte del Mencho."

with CSRL also prompted the newly elected government to dismantle the local police force and implement "Mando Unico," a policy where the state police forces take over public security functions in the municipality. Between 2018 and late-2021 (as of this writing), an intense war over Salamanca broke out between CJNG and CSRL. While CSRL was able to hold its ground through 2018, 2019 and most of 2020, the arrest of El Marro, leader of CSRL, in August 2020 severely weakened CSRL. By mid-2021, CJNG had taken over much of the territory in the municipality, with CSRL only having presence in a few communities on the outskirts of the urban center.

8.4.2 Case 2: León

León is the largest city in the state of Guanajuato. According to the 2020 census, the metropolitan area has a population of over 2.1 million, while the city itself has almost 1.6 million people. The metropolitan area is the seventh largest in Mexico. León is the economic and commercial capital of the state and has high socioeconomic levels. The metropolitan area is home to international companies such as Pirelli, Mazda, Toyota, Honda, General Motors, Volkswagen, Nissan, BMW, Nestlé, and Nivea, among others, and domestic companies, most importantly the leather and footwear industries. Being the epicenter of the state's industrial belt also means that León has a strong economic elite class and strong state capacity.

Politically, León elected its first opposition mayor in 1998 when the PAN party won local elections. With a three year exception between 2012 and 2015 when the PRI held the mayorship, all other mayors since 1988 have been from the PAN party. This has allowed the PAN party to build a strong base and cement local networks with political, social, and economic elites. It has also meant that the PAN has been able to establish strong links between local and state party members.

Cartel Dynamics

In this section I present the history of cartels in León, which is more complex than that of Salamanca, before investigating state capture. Unlike Salamanca, León did have some cartel presence before the government crackdown of December 2006, though it was minimal.

León was never a hub of illicit activities other than low-level crimes like drug dealing and auto-part theft, like any metropolitan area. Yet, León had some historical connections to CDS. Specifically, the CDS had presence and operations in the state of Guanajuato for decades prior to 2007. In León, various high-ranking members and their families lived in the city since the 1980s, with many of the children of important members living and attending school in León. León was seen as a safe haven since there were no major drug trafficking operations in Guanajuato, or León specifically, and because no other cartel operated in the city. However, for decades, the CDS had indirect operations in León, and Guanajuato more broadly, because they allegedly supplied local drug dealers in Guanajuato with drugs. However, this was small-scale. According to various accounts, the operational "presence" of CDS in Guanajuato was only to sell drugs in León, Irapuato, Celaya, and Salamanca. However, CDS did not sell directly to local consumers or operate in the state, their presence was limited to distributing wholesale drugs to local criminal groups who then acted as local dealers. This is why CDS never had local bosses (jefes de plaza) or tried to infiltrate local police or politics in Guanajuato, including León.

There are two versions about which CDS leader was in charge of supplying low-level drug dealers in the state. According to some accounts, Juan Jose Esparragoza Moreno "El Azul" oversaw operations in Guanajuato, primarily León, for CDS before 2007 (neither El Mayo nor El Chapo, the other main CDS leaders, had any business in the state). Another version that does not necessarily contradict the first is that Ignacio Coronel Villarreal "Nacho" was the CDS leader that had operations in León on behalf of CDS. The accounts that claim that El Azul was in charge of CDS operations in the state allege that in 2006 La Familia Michoacana met and negotiated with El Azul and agreed to exchange Guanajuato for territories in other states. The versions claiming

that Nacho was in charge of operations in León name the "Mata Zetas," a military unit created in 2007 that answered to Nacho, as the group operating in the state on behalf of CDS. Indeed, there is evidence that the Mata Zetas had intermittent presence in León in 2009 and 2010. These versions claim that following the death of Nacho in July 2010, the cell of the Mata Zetas that operated in León decided to become independent, though remained closely allied with CDS. This event marked the end of the CDS having direct operations in León outside of supplying drugs to local dealers.

As with Salamanca, the Zetas and LFM began entering León soon after the government crackdown. By the end of 2008, both cartels were operating in the municipality, where they began drug dealing, extorting, kidnapping, and soon thereafter stealing refined oil products from the pipelines running through León. In January 2011, when most LFM leaders renamed themselves CT, CT cells quickly took over most LFM operations in León.

In February 2011, the CJNG, a powerful cartel from the neighboring state of Jalisco, publicly announced its entry into in León and the Attorney General of Guanajuato immediately confirmed their presence. From 2011-2014, CJNG began making intrusions into León, with efforts intensifying in 2013-2014, but they found it difficult to penetrate León given Zetas and CT efforts to repel them. Nevertheless, their slow entry had consequences for the criminal underground in León. Like most large metropolitan areas, León had historically had small scale criminal groups—not cartels—that specialized in "common" crimes, such as car parts theft, drug dealing, extortion, property theft, cargo truck theft, credit card theft, among other similar crimes. After CJNG began making small inroads into León in 2011, CJNG allegedly offered these local criminal groups in León an acquisition, but when many refused, CJNG began killing them. In response, in 2014, various of these local groups, each operating in different neighborhoods of León, came together and formed an alliance that would later be called Cartel La Union de León or La Union León or Gente de León (herein CUL). CUL is not one unified, hierarchical group, but rather a confederation of separate groups working together to fight CJNG. Each group operates

independently but band together when necessary. CUL is composed of at least ten different groups and is thus not a "cartel" but still a powerful confederation of local criminal groups.

In first three months of 2015, both the Zetas and the CT cartels fragmented and their cells and operations in Guanajuato, including in León, were severely weakened, giving the CJNG the opportunity to enter León with full force. CJNG quickly took over many parts of León, took over oil theft, and began an intense war against CUL (which now also included remnant cells of LFM, CT, and Zetas) and Cartel los Durango (CLD), another local criminal group operating in León specializing in local drug dealing, armed robbery, and vehicle theft. This war—CJNG versus CUL and CLD—remained the primary criminal dynamic and driver of violence in León from 2014 to early 2020.

In 2020 three major changes occurred. First, Cartel Nueva Plaza (CNP), which operated in the neighboring state of Jalisco, entered León in the first half of the year, allied itself with CUL, and began fighting CJNG in León. Second, in mid 2020, Manuel Reyna Hernandez "El 00," who was the local boss (*jefe de plaza*) for CJNG in León, defected, allied itself with CNP and CUL, and began to fight CJNG. Third, almost immediately after the arrest of El Marro, leader of CSRL, in August 2020, CDS sent members of their armed forces to various municipalities in Guanajuato, including León, to fight CJNG. These events strengthened local opposition to CJNG and intensified the war in León over control of illicit economies. However, this unified opposition did not last long. In March 2021, CJNG captured and killed one of the CNP leaders, marking an end to both CNP and El 00 in León.

State Capture

Given that much of the state capture in León since 2008 has been of police, it is important to note that prior to cartels entering the municipality, León had a high capacity and professional police. The León municipal police had a very good reputation, was professional, regularly received training, equipment, and investments, had established evaluation procedures, obtained quality

accreditations from external organizations, had a special tactical group focused on attending high-impact crimes, and was thus considered among the best in the country.

Pre-2006 Municipal Governments

Despite CDS supplying drugs to local drug dealers in León, CDS never had local bosses (jefes de plaza) or tried to infiltrate local police or politics in Guanajuato, including León. However, many of the local criminal groups that formed CUL in 2014 and CLD had operated in León for decades and were composed of local criminal actors that were deeply embedded in their communities, particularly in marginalized neighborhoods on the outskirts of León. According to some media accounts and interviews with a local security analyst and political campaign manager, some of these groups had formed strong ties with certain members of the municipal police. However, these relationships were allegedly largely non-coercive and based on mutual gain. This is also why before 2009, no government official, including police officers, had been killed by criminal groups in León.

2006-2009 Municipal Government

This began to slowly change with the entry of LFM and the Zetas into León, who quickly began to establish their presence and operations in the municipality. As they did, they allegedly began to seek to build ties with local police. The first casualty in León resulting from these efforts occurred soon after LFM and the Zetas entered León when, in July of 2009, six armed men followed a federal police officer assigned to León to his home and proceeded to kill him with more than a dozen rounds from AK-47 rifles. A few days later, state forces arrested four members of LFM who were alleged to have perpetrated the attack. Among those arrested was Francisco "El Panchito," nephew of one of the main LFM leaders. However, despite cartel presence growing in the municipality and this attack against a police officer, the state maintained a large degree of control over crime and violence, leaving cartels to rely largely on state protection from specific members of the police agency. These networks came to light when three municipal police officers were arrested in August 2009 and accused by the State Attorney General's Office of protecting

LFM by providing them with information on police operations. In return, these three police officers received a monthly salary from LFM. Through the State Attorney General released a statement claiming that these were the only three police officers providing protection to cartels, suspicions and accusations remained about other police officers.

2009-2012 Municipal Government

This dynamic, low level conflict between LFM (and CT beginning in 2011) and Zetas cells in León with protection from the local police, largely remained unchanged until 2012, when the CJNG began making greater efforts to enter León after having started entering in 2011. During this administration, close to 600 police officers, of about 1,000 total officers in the department at the time, failed their security evaluations, one dimension of which is meant to identify whether the individual officer is colluding with cartels. In an interview with an high-level member of the police department at the time, one of the three main reasons that individuals failed the evaluation were drug use, taking a bribe, and because "they had a very different lifestyle than what they could afford with their [police] salary," which indicates ties with criminal organizations.

Starting in 2012, frustrated in their slow progress in taking over León, CJNG began leaving public messages accusing local police officers of protecting other cartels. These intensified efforts to enter and take over León began to drive an increase in visible violence in the municipality, with some local newspapers writing about the wars between cartels in León for the first time.

Under this context, León experienced its second political assassination when a member of the federal Attorney General's Office assigned to León was ambushed by four individuals who shot over 25 bullets at the government official.

2012-2015 Municipal Government

With the beginning of a new administration, the violence caused by CJNG attempts to enter and take over León continued. In August of 2013, the head of the homicides division in the State Attorney General's Office was stopped by armed men while driving and shot to death. With the weakening of CT and Zetas in 2014 and their disintegration in the beginning of 2015,

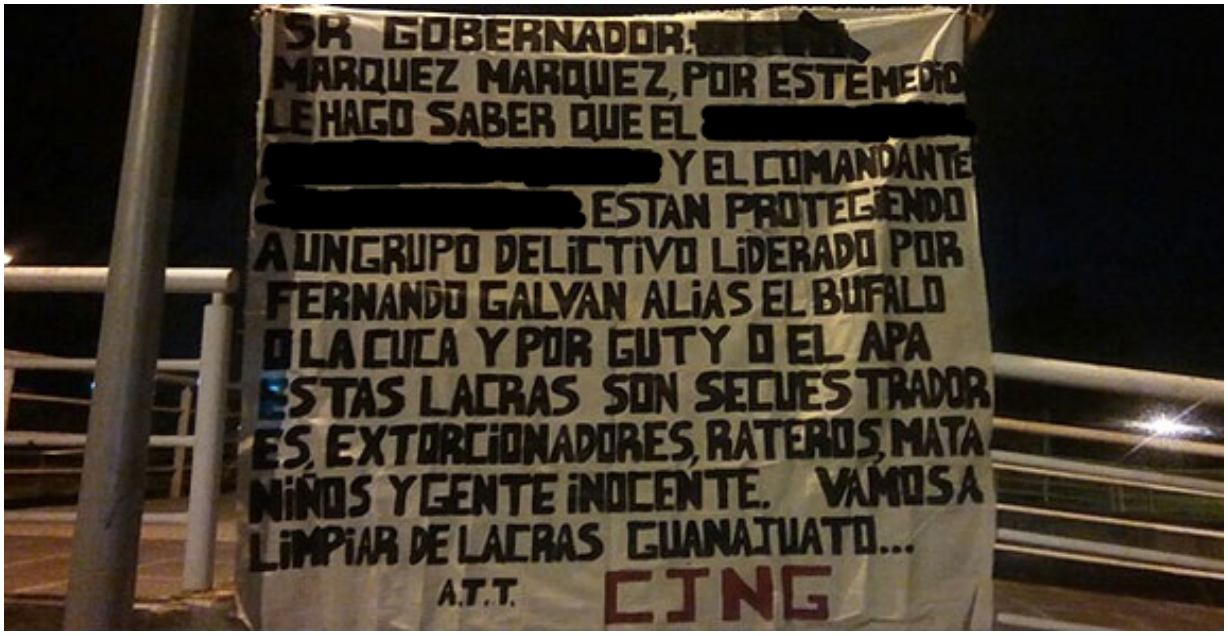


Figure 8.3: Message left by CJNG in León in April 2014 accusing a police officer and commander of protecting leaders of CUL. Names of the accused have been redacted.

CJNG began making large and fast inroads into León despite the formation of CUL in 2014 to counter CJNG advances. With no one left but CUL and CLD, CJNG began major assaults against these rivals but found it hard to combat these smaller criminal organizations given the close ties they had formed with police officers over decades. This frustrated a much stronger CJNG, who began publicly accusing specific members of the local police of protecting CUL and their leaders. For example, in April 2015, CJNG placed two large banners along main roads in León accusing, by name, a municipal police officer and a police commander of protecting the leaders of CUL. Figure 8.3 shows the image of this message with the names of the police officers redacted. The message reads: "Mr. Governor Marquez Marquez, I hereby let you know that the [police officer] and commander... are protecting a criminal group led by Fernando Galvan alias El Bufalo or La Cuca and by Guty or El Apa. These scourges are kidnappers, extortionists, thieves, they kill children and innocent people. We are going to clean Guanajuato of scourges. Sincerely, CJNG."[11]

These were not isolated incidents, as one of the constant public scandals during this

[11]Translated by author.

administration was the great number of police officers fired due to them failing the security evaluations that, among other dimensions, seek to check whether police officers are colluding with criminal organizations. For example, by the end of 2013, 500 of the 1,185 members of the municipal police failed their evaluations, 400 of which were fired by the end of the year. The mayor, who was signaled as one of the roots of the problem by some local actors, insisted that she had inherited the problem from previous administrations, of which there is some evidence.

2015-2018 Municipal Government

With CJNG in full offensive against CUL and CLD, the new administration took over, leaving these cartels fighting over state protection. During this administration, violence in León reached new highs, with the homicide rate more than doubling. According to local media outlets, the conflict escalated when El Guty, founder and leader of CUL, was assassinated in May 2016. Soon after, in October of 2016, a municipal police officer was shot and killed. In November of 2016, the chief of the municipal police was fired, officially for incompetence, though some media and local actors claimed that it was actually due to information provided to the mayor by the State Attorney General's Office indicating that he was protecting one of the criminal organization operating in León. In 2021, an arrest warrant was issued for this former police chief for allegedly protecting a cartel in Guanajuato, including helping a cartel leader escape an arrest attempt and acquiring safe houses for this cartel.

This marked the beginning of a violent fight over which side could capture the police to receive protection and gain an upper hand against the other side. This had dire consequences for law enforcement. After the 2016 assassination of a municipal police officer, another was killed in March 2017, another two were ambushed and killed in June 2017, three others were shot and killed in 2018, and a state ministerial police officer was assassinated in January 2018.

This fight over state protection culminated in the first political assassination experienced by León. On June 15, 2018, Jesús Nolasco Acosta, a candidate for the municipal council, was driving on his motorcycle when he was ambushed and killed after being shot multiple times.

In response to the growing insecurity caused by the power and influence being amassed by CJNG and CUL in León, the federal government sent 300 military police officers to the municipality to conduct public security duties. Moreover, the 2015-2018 municipal administration, with help from the federal government, made investments of about $20 million USD to strengthen the local police. Nevertheless, under this administration, around 400 members of the municipal public security agency that failed their security evaluations were fired, and even if a small percentage were due to collusion with cartels, it still suggests that problems of capture were still present.

8.5 Conclusion

This chapter presents two in-depth case studies based on extensive qualitative research. The case studies outlined how cartels began to enter Salamanca and León following the government War on Drugs, how they took over the oil theft market, and how they began capturing local state officials to protect their new business in territories where they had previously not operated. These case studies outline how cartels were able to entrench their presence in territories they had never operated in just a few short years. More broadly, they also highlight the detrimental political consequences of cartel intrusion into a territory. These cases also provide empirical evidence countering existing arguments that criminal organizations successfully expanding to new territories is extremely difficult and rare, and provides novel insights about how they are able to accomplish this expansion.

Chapter 9

Conclusion

One of the most important transformations in Mexico's criminal underworld over the past 20 years has been the evolution of the country's large criminal organizations. For decades, Mexico's underworld was dominated by a handful of powerful drug cartels that specialized in the most lucrative illicit activity in Mexico: providing wholesale illicit drugs to the world's largest consumer market, the United States. Drug cartels had historically operated in limited regions of the country, mainly those central for drug cultivation, production, and trafficking, and operated clandestinely. However, starting in 2007, drug cartels began undergoing a major transformation, evolving from being primarily drug traffickers to what I call *criminal enterprises*, or criminal organizations systematically involved in a diverse set of activities. At the same time, cartels began to expand geographically, extending their tentacles beyond their historical strongholds. Unfortunately, this expansion was not transient: cartels successfully entrenched their presence and operations in many of the new territories they entered.

In this dissertation, I seek to understand this transformation and its implications for politics and citizen well-being. First, I investigate why government policies designed to combat drug trafficking prompted drug cartels to diversify their activities. Second, I explore why cartels diversifying their activities resulted in them expanding their presence and operations beyond

their historical strongholds and into new territories. Third, I explore the consequences of cartels entering new territories for local politics and citizen well-being. In doing so, this dissertation explores both how the state impacts the behavior of criminal organizations and how criminal organizations, in turn, seek influence over the behavior of the state.

In investigating the events that have unfolded in Mexico over the past 15 years, the dissertation offers new theoretical insights about how to understand criminal organizations and their strategic decision making, and how to conceptualize their relationship with the state. First, in contrast to the longstanding conventional wisdom that assumes that criminal organizations as economic profit seeking actors, I contend that they are more financially savvy and actually make decisions about how to invest their capital based on market conditions. Specifically, I argue that to the extent that criminal organizations are financially risk averse, they will also be receptive to the risks associated with their investments. Using this argument, I then content that specialized drug cartels can respond to government intervention against drug trafficking in a way that shields their finances, not just maximize profits. One such response is diversifying their activities, as this spreads the risks across various investments.

Moreover, I challenge recent scholarship that characterizes the relationship between the state and criminal organizations as one between politicians and criminals where criminal organizations capture the state "from above," which provides them with de facto control over governments, territories, and people. Instead, I propose a more nuanced picture where criminal organizations interact with different state actors, each providing different benefits even in the absence of protection from politicians. The case I present also challenges recent definitions of criminal organizations by political scientists that include state protection as an intrinsic characteristic of organized crime (Trejo and Ley 2020). Showing that criminal organizations can enter new political jurisdictions where they had no pre-existing state protection and entrench their presence by then obtaining that protection through the capture of state officials underscores that state protection is an *outcome* of a strategic interaction between state actors and criminal organizations,

not that, by definition, state protection is an inherent feature of criminal organizations. The framework provided here also highlights that the dynamics of state capture are dynamic and fluctuate through time and space, and can vary across types of state actors. Even more, these interactions between criminal organizations and the state are not just dealings that happen behind closed doors without repercussions, instead, I show that they have important consequences for local democratic accountability, institutional capacity, and citizen well-being.

By exploring these relationships, I underscore that the interaction between the state and criminal organizations is not one of substitution (criminal organizations being present when the state is absent), but is instead a complex and interactive relation where they both coexist in the same spacetime. More fundamentally, the insights I provide reinforce the burgeoning view that politics is central to the study of organized crime.

9.1 Organized Crime and the State

9.1.1 Government Drug Wars and Cartel Diversification

The dissertation provides evidence that the government War on Drugs created a shock in the drug market, leading the country's powerful cartels that had specialized in drug trafficking for decades to diversify their activities and transform into criminal enterprises. Unlike existing leading accounts that claim that cartel diversification was a consequence of wars between cartels, I show that this was not the case. Furthermore, like any legal firm that transitions from specializing in one activity to diversifying their investments into multiple activities, cartels choosing to diversify had consequences for their internal organization. This decision entailed cartels needing to acquire new expertise and knowledge, obtain new types of assets, expand the type of labor they hired, create new internal subdivisions to oversee specific activities, and integrate new managerial duties, among others. Additionally, I show that powerful cartels deciding to undertake new activities had important consequences for the prevalence of these activities. Moreover, unfortunately, this

resulted in a substantial rise in predatory crimes targeting civilians, including property theft, extortion, and kidnapping for ransom. While cartels had largely stayed away from crimes that directly impacted citizens in their regular life prior to the government drug war, diversification pushed them closer to citizens.

Speaking more broadly, the evidence I present shows that an unintended consequence of the government's War on Drugs was that it disrupted cartel finances and led them to strategically respond to new economic incentives. This is crucial, as most existing research focuses on the violence repercussions of such heavy-handed government crackdowns, but overlooks other important effects. This is also crucial, as cartels diversifying had important ramifications for citizen well-being and politics.

9.1.2 Expanding Criminal Enterprises to New Territories

The dissertation argues that, to the extent that lucrative new business opportunities are geographically fixed and outside cartel strongholds, cartels choosing to diversify to these activities creates strong incentives for them to expand geographically beyond their strongholds and into the territories with these lucrative opportunities. Examining oil theft, which all cartels diversified to soon after the government drug war and which can only be done from oil pipelines, I provide extensive evidence that cartels strategically expanded their presence after the crackdown and targeted that expansion to territories with these pipelines. This expansion was also not transitory, as cartels quickly entrenched their presence and operations in these territories. These findings counter longstanding theories arguing that organized crime expansion is extremely rare and difficult because criminal organizations rely on local networks with citizens and state actors.

9.1.3 State Capture by Criminal Enterprises

Finally, this dissertation offers novel theoretical claims about the interaction between the state and criminal organizations. Unlike existing research that examines this relationship in the historical strongholds of criminal organizations, I examine these interactions in territories criminal organizations have recently expanded to. This allows me to observe how these state-criminal organization dynamics emerge and settle.

Centrally, the dissertation argues that when entering new territories, criminal organizations seek to obtain state protection by capturing local state actors in order to protect their activities in these places. In attempting to acquire this state protection, criminal organizations attack local democratic processes, among other actions, since local politicians respond to these political incentives. I provide evidence that, as a result of these actions, criminal organizations end up eroding local democratic accountability. Moreover, in-depth qualitative case studies demonstrate how criminal organizations attempt to capture local state actors, oftentimes successfully, and what this looks like on the ground in the real world. Furthermore, results show that criminal organizations entering new territories significantly increases crime and violence. These findings have undesirable but crucial implications: the number of people living under criminal governance increased dramatically following the government War on Drugs. This makes understanding the phenomenon even more important. Especially given the that state protection allows criminal organizations to operate with some degree of impunity, allowing them to victimize citizens.

These results counter recent arguments that make state protection a defining inherent characteristic of criminal organizations. Instead, by analyzing territories that had previously not had organized crime presence and then experienced its intrusion, I show that state protection is an outcome of active efforts by criminal organizations and a strategic interaction with the state. I also provide one of the first investigations about criminal organizations outside of their historical strongholds, which will undoubtedly help us expand our understanding of the phenomenon.

9.2 Policy Implications

This dissertation is academic in nature, but it focuses on the state and its relation with powerful criminal organizations. Its theoretical insights and empirical findings therefore have important policy implications that policymakers may consider when looking at how to address organized crime and their negative externalities.

First, when the Mexican War on Drugs began, the logic behind it was intuitive: attack the source of revenue of cartels, illicit drugs, to cripple their finances and, as a result, weaken their capacity to perpetrate crime and violence. In other words, attacking their money would translate to them having fewer means to hire hitmen, buy state protection, and purchase weapons and other assets, among other actions. This logic is entirely reasonable given our current understanding of criminal organizations as profit maximizing economic actors. However, what existing research has pointed out is that the intuitive logic behind the government drug war was flawed. Instead, a shock to cartels' only source of revenue through a drug war made illicit drugs more valuable and thus more profitable, exacerbating incentives to fight over the drug market at all costs. Existing research has made clear that policymakers should consider the violent repercussions caused by heavy-handed government approaches aimed at combating criminal organizations. This is entirely understandable given that violence is very visible and relatively easy to measure.

What this dissertation adds is another dimension that has been overlooked by existing research. That is, that policymakers also need to think about criminal organizations as sophisticated economic actors that will respond strategically to economic incentives. The idea that drug cartels would simply accept the negative shock to the drug market caused by a government War on Drugs oversimplifies the financial literacy of drug cartels. The failure to consider this when designing the drug war resulted in drug cartels transforming into criminal enterprises. And, unfortunately, simply reverting to the policies in place prior to the crackdown will not undo this transformation.

The theoretical insights provided by this dissertation imply that policymakers need to re-

think how they design interventions against drug markets when combating drug cartels. Centrally, intensifying interdiction efforts to curtail drug trafficking may cause unintended consequences beyond increasing violence. Instead, if the government goal is to weaken cartels' financial capability, policymakers should focus on actions that do not create the incentives outlined in this dissertation, for example, targeting cartel bank accounts, money laundering operations, assets (safe houses, machinery, vehicles, weapons, etc.), and financial operators.

A second important implication relates to how to deal with the state capture that allows criminal organizations to enter and entrench their operations in certain territories. While the vast majority of the current literature focuses on the connection between politicians and criminal organizations, this dissertation shows that state capture and political protection is more complex and nuanced. For example, avoiding the capture of politicians does not preclude criminal organizations from capturing other state actors and receiving state protection, and in fact, may make capturing these other state actors much more valuable. One corollary that follows existing research is that countering the presence of criminal organizations once they have entered a territory is extremely difficult. However, cartels successfully entering a territory is not a foregone conclusion.

A first crucial step is therefore to design and implement policies that increase the cost for cartels to enter a new political jurisdiction. Safeguarding police, civil servants, and the local political class *before* cartels enter—when they are threatening to—is crucial. Centering efforts on preventing or cutting ties early on before criminal organizations begin establishing and cementing their networks may prove the most efficient policy. Supporting local governments that begin to fear or experience the intrusion of criminal organizations should be a priority for state and federal governments.

Still, if cartels enter a territory and begin establishing their networks of state protection, as other scholars have pointed out, targeting their state protection is key. Yet, it is important to note that punitive policies from above that punish captured state actors for protecting criminal

organizations is not enough. As some of the evidence has shown, powerful cartels in Mexico can capture state actors through fear and intimidation regardless of the probability of future punishment. For example, in Leon, police officers undergo screenings every two years so they know they face termination if they protect cartels, but the fear of being killed by cartels supersedes the potential administrative punishment. Implementing policies that ward off potential colluders while also putting in place policies that protect state actors so they are not forced to collude with criminal organizations is key.

Appendix A

Appendix

A.1 Drug Trafficking and Oil Theft

Table A.1 shows the regression results of the geographic correlation between cartel presence and product pipelines before the government crackdown. The statistically significant negative correlation provides evidence that the government crackdown that focused on drug trafficking hubs and thus increased the risk involved in the drug market likely affected oil theft minimally.

A.2 Cartel Expansion: Geographic Spillover

Scholarly works on crackdowns and criminal violence have suggested two different types of arguments, generally speaking, about organized crime expansion in Mexico. Both arguments, however, point to crackdowns generating a spillover effect where government intervention in one place pushes criminal organizations to expand operations to contiguous neighboring territories.

The first argument stems from a studies on the Mexican War on Drugs and the diffusion of violence. This literature has generally found that the 2007 government crackdown in Mexico

Table A.1: Geographic correlation between cartel presence and distance (in meters) to municipalities with oil pipelines prior to the government crackdown, 2000-2006.

	Dependent variable:	
	Distance to Oil Duct	
	(1)	(2)
Cartel Number	−6,889.183***	
	(2,660.906)	
Cartel Dummy		−19,493.290***
		(4,970.337)
Constant	72,928.840***	73,021.580***
	(531.531)	(532.054)
Observations	17,192	17,192
R^2	0.0004	0.001
Adjusted R^2	0.0003	0.001
Residual Std. Error (df = 17190)	69,378.660	69,361.160
F Statistic (df = 1; 17190)	6.703***	15.381***
Note:	*p<0.1; **p<0.05; ***p<0.01	

increased violence in territories along drug trafficking routes and their neighboring municipalities as drug cartels fought over control of these routes. Implicit in these works is the argument that criminal organizations expanded or attempted to expand to territories alongside or around drug trafficking routes.

For example, Calderón et al. (2015) look at Mexico and find that leadership decapitation intensifies drug-related and overall violence in municipalities where leaders of drug cartels were captured or killed, and that this had spillover effects on neighboring municipalities. The authors theorize that this violence occurs because leadership removal leaves the targeted cartel vulnerable, triggering inter-cartel wars as rival drug cartels attack the territory of the vulnerable drug cartel, and intra-cartel wars as potential successors fight for control of the organization. Osorio (2015) argues that crackdowns can have a spillover effect on violence by disrupting the status quo between criminal organizations operating in neighboring territories, and finds evidence supporting the theory when looking at Mexico.

A second, yet similar argument, is proposed by Dell (2015), who argues that in Mexico, local crackdowns in municipalities along major drug trafficking routes diverted drug trafficking around those municipality as drug traffickers sought to circumvent law enforcement. This led to increased violence in municipalities neighboring major drug trafficking routes.

These arguments all imply two types of organized crime expansion patterns that are geographically limited. One implies an expansion pattern where criminal organizations go to other territories that already have criminal organizations operating there, meaning we would observe no new territories with criminal organizations following crackdowns. This is clearly not the case. The other argument suggests a geographically limited expansion to territories that are contiguous to those where organized crime was already present. Moran I's test does show spatial interference. This dynamic is accounted for in the main DiD by incorporating spatial interference into the main DiD model.

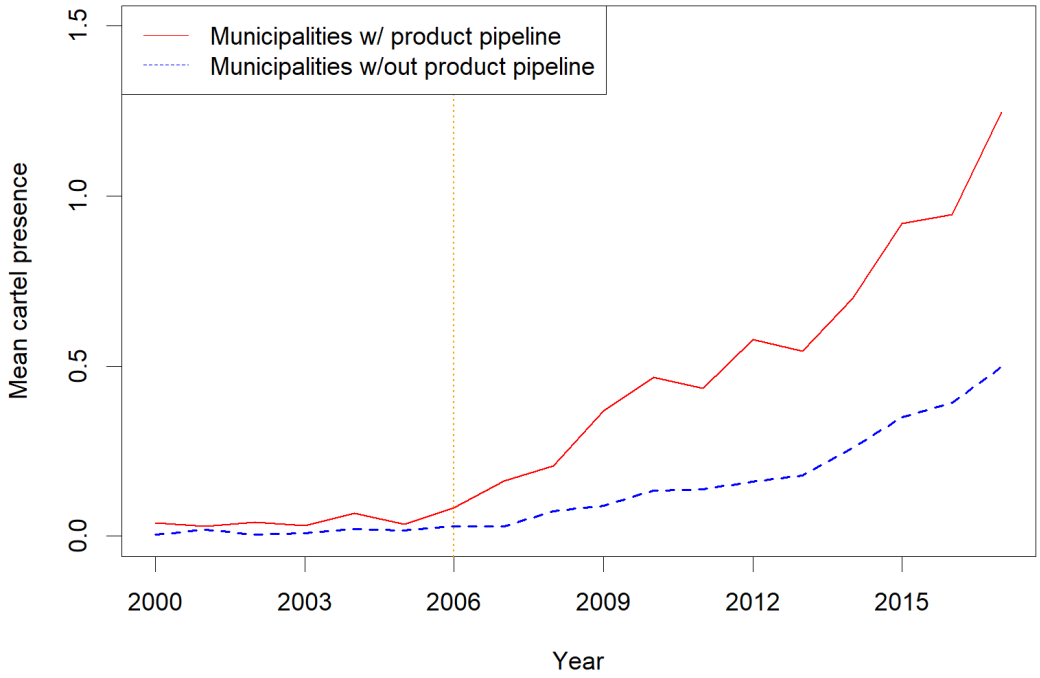


Figure A.1: Mean number of cartels in municipalities with and without product pipelines.

A.3 Cartel Expansion: Robustness Checks

A.3.1 Alternative Outcome Measure

This section presents the main DiD results on cartel expansion using the alternative outcome measure: number of cartels per municipality. Table A.2 shows the main results and Figure A.1 shows the parallel trends.

A.3.2 Pipeline Placement

One threat to inference is that some covariate related to territories with pipelines, but not pipelines themselves, prompted cartels to move to these territories, and cartels only started stealing these resources once they were already there. To address this concern I conduct a placebo

Table A.2: Crackdowns and cartel expansion.

	Number of Cartels				
	TWFE		SADID		CADID
Model:	(1)	(2)	(3)	(4)	(5)
Crackdown*Pipeline	0.372***	0.278***	0.326***	0.228***	0.325***
	(0.053)	(0.051)	(0.051)	(0.051)	(0.051)
Spatial Spillover		0.449***		0.434***	
		(0.032)		(0.033)	
Covariates	Yes	Yes	Yes	Yes	No
Municipality FE	Yes	Yes	Yes	Yes	
Year FE	Yes	Yes	Yes	Yes	
Observations	43,974	41,531	43,974	41,531	44,208
R^2	0.468	0.514	0.475	0.518	

Standard errors clustered at municipality level. TWFE = Two-way fixed effects. SADID = Sun and Abraham (2021). CSDID = Callaway and Sant'Anna (2021).
Notes: *p<0.1; **p<0.05; ***p<0.01

test using crude oil pipelines as a placebo. This placebo tests whether omitted factors correlated with underground pipelines explain the main results. While product pipelines, as explained earlier, transport refined products like diesel and gasoline that are ready to sell as is, crude oil pipelines transport crude oil, which cannot be used unless refined.

While a handful of clandestine refineries that process crude oil into refined products have been uncovered in Colombia, Ecuador, Peru, and Argentina, none have been found or reported in Mexico. Therefore, crude oil pipelines are worthless to organized crime in Mexico. Yet, both crude oil and product pipelines run underground, transport hydrocarbons, and, at times, even run parallel to each other. The expectation, therefore, is that crude oil pipelines should not have any effect on the presence of organized crime.

It should be clear, however, that cartels have been found to steal crude oil in Mexico, though these thefts are reported to be from storage centers close to the northern border (Perez 2012), not pipelines,[1] and sold primarily to US companies in Texas.

Categorizing municipalities by whether they have each type of pipeline results in four

[1]While a few news reports have claimed that certain fuel theft incidents include cartels stealing crude oil from pipelines, the author has found that reporters tend to confuse or not know the difference between the types of pipelines. For example, following the detection of an oil theft incident along a pipeline, reports sometimes claim that gasoline and diesel were stolen from an "oleoducto" (crude oil pipeline)—products that crude oil pipelines do not transport.

Table A.3: Number of municipalities with product and crude oil pipelines.

	Product pipelines	No product pipelines
Crude oil pipelines	143	81
No crude oil pipelines	170	2062

groups of municipalities: Those without any pipeline, those with only product pipelines, those with only crude oil pipelines, and those with both product and crude oil pipelines. Table A.3 shows the breakdown of municipalities by group.

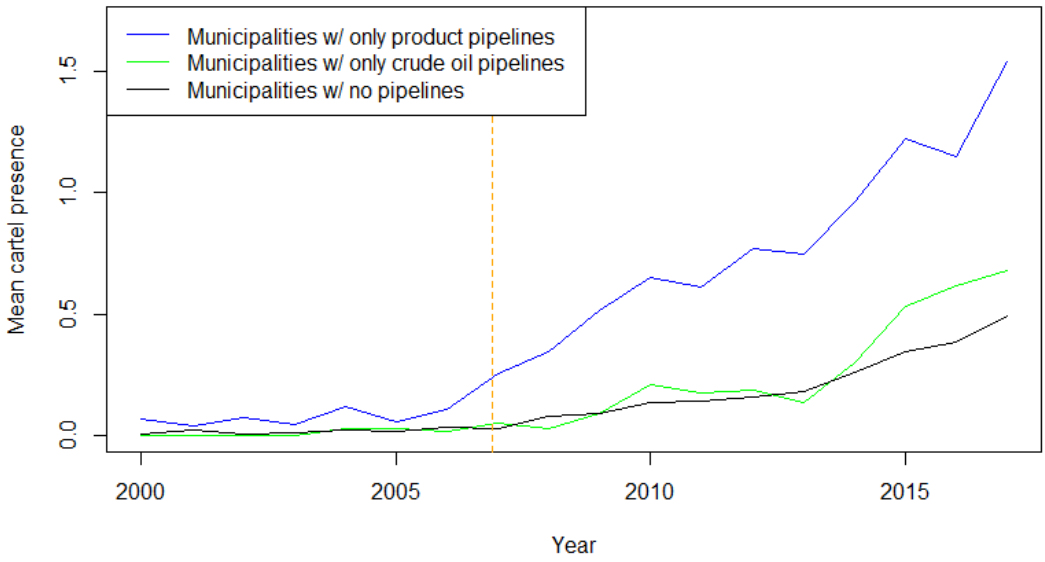
Given the overlap, running a DiD with the treatment groups assigned according to whether they have crude oil pipelines might result in positive and statistically significant results, but this could be driven by the units in the treatment group that also have product pipelines. To tease out the actual treatment effects from that of the placebo, I run a difference-in-difference-in-differences (DiDiD). This identification strategy compares municipalities without any pipelines to those with either or both product and crude oil pipelines before and after the treatment. In this case, the control group are municipalities without either product or crude oil pipelines, the placebo group is composed of municipalities with crude oil pipelines, and the treatment group includes municipalities with product pipelines.

Figure A.2 shows the trends through time for the average cartel presence in each type of municipality depending on whether and which pipelines they have. These trends suggest that municipalities with product pipelines saw the largest increase in cartel presence following the crackdown. However, I test this hypothesis more formally.

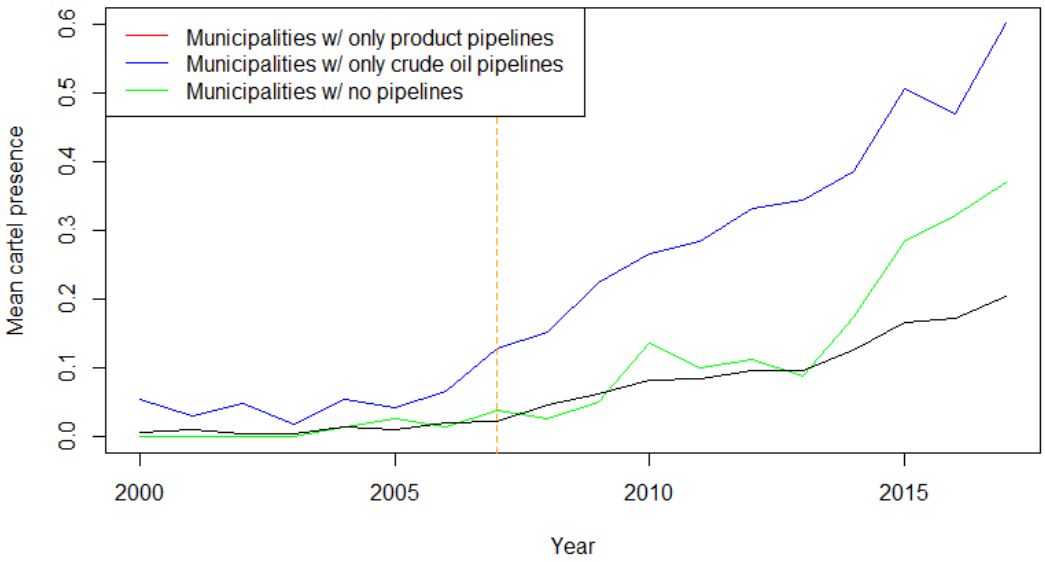
The regression equation follows the form:

$$\begin{aligned} CO_{it} =& \rho CO_{\Phi(t-1)} + \gamma_1(product_i * crackdown_t) + \gamma_2(crude_i * crackdown_t) \\ &+ \gamma_3(product_i * crude_i * crackdown_t) + \delta X_{it} + \psi_i + \tau_t + e_{it} \end{aligned} \tag{A.1}$$

Under this specification, γ_1 estimates the causal effect of only product pipelines, γ_2



(A)



(B)

Figure A.2: Mean (A) number of cartels and (B) cartel dummy from 2000-2017 for municipalities with no pipelines, with only product pipelines, and only crude oil pipelines.

estimates the effect of only crude oil pipelines, and γ_3 estimates the effect of having both product and crude oil pipelines. The main coefficients of interest are thus γ_1 and γ_2, with the expectation that γ_1 is positive and statistically significant while γ_2 is not statistically significant.

DiDiD strategies can be challenging to conceptualize, but with this estimation strategy γ_1 and γ_2 are the equivalent of running two independent DiDs, one where the treatment group is composed of municipalities with only product pipelines and the control group includes municipalities without any pipeline and the other where the treatment group is composed of municipalities with only crude oil pipelines and the control group includes municipalities without any pipeline, respectively. The main coefficients of interest in these two independent DiDs would be near identical to γ_1 and γ_2 in this DiDiD. However, the DiDiD also takes into consideration the municipalities that have both product and crude oil pipelines, which is why it's preferred here.

Table A.4: Placebo DiD results using the number of cartels and a cartel dummy as the outcome measures.

	Cartel Number	Cartel Dummy
	TWFE	
	(i)	(ii)
Spatial Spillover	0.442***	0.366***
	(0.058)	(0.046)
Crackdown*Product Pipeline	0.396***	0.153***
	(0.094)	(0.027)
Crackdown*Crude Oil Pipeline	0.046	0.041
	(0.060)	(0.028)
Covariates	Yes	Yes
Observations	41,531	41,531
R^2	0.515	0.447
Municipality fixed effects	✓	✓
Year fixed effects	✓	✓

Two-way cluster-robust standard errors.

Table A.4 shows the results of this placebo test. Results show that the effect is driven

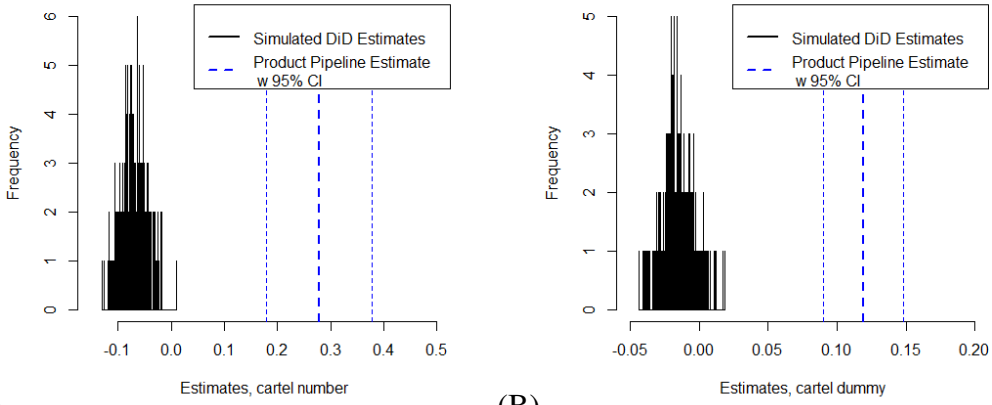
entirely by product pipelines, with crude oil pipelines having no effect on cartel expansion after the crackdown. This builds confidence that it is not some third factor associated with pipelines other than oil theft that is driving the effect.

A.3.3 Simulating Organized Crime Expansion

Another potential threat to inference is that organized crime might, by chance, have expanded to municipalities with pipelines more than other municipalities. To determine whether this is a plausible concern, I use a Monte Carlo simulation to test the likelihood of observing the main DiD result due to chance.

The process is the following: Given that there are 313 municipalities with product pipelines, I draw 313 municipalities without replacement and assign them as the treatment group and the rest of the municipalities as the control group. To draw these municipalities I create a uniform probability distribution over municipalities without any cartel presence between 2000 and 2006 (pre-treatment). In other words, municipalities without cartel presence between 2000 and 2006 are assigned an equal probability of being drawn into the treatment group. I then run a DiD using the same specification as the main results (equation 6.1) except for replacing the pipeline dummy with the new simulated treatment group, and save the DiD estimate. I repeat this process 1,000 times. I then plot the distribution of the DiD estimates of the Monte Carlo simulation. In this histogram I also plot the estimate and confidence intervals from the main product pipeline model to see how likely it is that the main results from the baseline DiD are due to chance. I conduct this simulation using the dummy variable denoting whether a municipality has cartel presence or not as well as the variable measuring the number of criminal organizations in a municipality. As the plots show, this test provides very strong additional evidence that cartel expansion to municipalities with product pipelines was not due to chance, but rather strategic and targeted.

Figure A.3 shows the results. As can be seen, the likelihood of observing the main



(A) (B)

Figure A.3: Distribution of simulated coefficients (black lines) and estimate of main results (blue dashed line) with 95% confidence intervals (blue dotted lines) using main TWFE model and the two main outcomes: (A) number of cartels and (B) cartel dummy.

estimates by chance are extremely rare—no simulated estimate is as large as the main estimate. This test provides very strong additional evidence that cartel expansion to municipalities with product pipelines was not due to chance, but rather strategic and targeted.

A.4 Consequences of Cartel Expansion

A.4.1 Reduced Form

Tables A.5 and A.6 show the reduced form results for the instrumental variables analysis following equation 6.3.

A.4.2 First Stage: Alternative Cartel Measure

Table A.7 reports the results of the first stage using the alternative outcome measure: number of cartels.

Table A.5: Reduced form, oil pipelines and local democratic accountability.

	Dependent variable:	
	Winning margin	Number of candidates
	(1)	(2)
Product pipelines	0.014^{***}	-0.314^{***}
	(0.004)	(0.055)
Controls	Yes	Yes
Year FE	Yes	Yes
Observations	6,952	6,952

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the municipality level.

Table A.6: Reduced form, oil pipelines and crime.

	Dependent variable:				
	CO-related homicide	Extortion	Kidnapping	Drug use	Theft
	(1)	(2)	(3)	(4)	(5)
Product pipelines	3.046^{***}	0.300	0.153^{***}	0.932^{***}	0.257^{***}
	(0.750)	(0.208)	(0.050)	(0.208)	(0.050)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	26,774	17,038	17,038	19,472	17,038

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the municipality level.

Table A.7: Cartel presence and oil pipelines (First Stage). Column (1) shows placebo test using product pipelines prior to the government crackdown. Column (2) shows placebo test using crude oil pipelines after the crackdown. Column (3) shows the main results using product pipelines after the crackdown.

	Dependent variable:		
	Num. of cartels		
	Pre-Crackdown (Placebo)	Post-Crackdown (Placebo)	Post-Crackdown
	(1)	(2)	(3)
Product pipelines	0.007		0.086***
	(0.007)		(0.020)
Crude oil pipelines		−0.079***	
		(0.018)	
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	17,038	26,774	26,774

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the municipality level.

A.4.3 Second Stage: Alternative Cartel Measure

Tables A.8 and A.9 show the second stage of the instrumental variables analysis using equation 6.3 using the alternative outcome measure, number of cartels.

Table A.8: Cartels and local electoral outcomes (Second Stage).

	Dependent variable:	
	Winning Margin	Num. of Candidates
	(1)	(2)
Number of Cartels	0.200*	−4.361**
	(0.115)	(2.220)
Controls	Yes	Yes
Year FE	Yes	Yes
Outcome mean — Cartel = 1	0.134	5.867
Outcome SD — Cartel = 1	0.129	2.126
Observations	6,952	6,952

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the municipality level.

Table A.9: Cartels and crime (Second Stage). Outcome variable is number of cartels.

	Dependent variable:				
	CO-Related Homicides	Extortion	Kidnapping	Drugs Use	Theft, in thousands
	(1)	(2)	(3)	(4)	(5)
Number of Cartels	35.585***	4.071	2.250*	11.456***	2.850***
	(10.072)		(1.347)	(4.366)	(1.032)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Outcome mean — Cartel=1	17.312	9.193	1.772	1.901	1.113
Outcome SD — Cartel=1	62.455	25.387	5.939	11.482	3.032
Observations	26,774	17,038	17,038	19,472	17,038

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the municipality level.

A.4.4 Reduced Form: Crime and Homicide Rates

Tables A.10 shows the reduced form results for the instrumental variables analysis following equation 6.3 but using the rates of homicides and crimes.

Table A.10: Reduced form, oil pipelines and crime.

	Dependent variable:				
	CO-related homicide rate	Extortion rate	Kidnapping rate	Drug use rate	Theft rate
	(1)	(2)	(3)	(4)	(5)
Product piplines	0.019***	0.0002	0.002**	−0.001	0.960***
	(0.004)	(0.002)	(0.001)	(0.001)	(0.110)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	26,774	17,038	17,038	19,472	17,038

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the municipality level.

A.4.5 Second Stage: Crime and Homicide Rates

Table A.11 and A.12 show the results of the second stage of the instrumental variable analysis following equation 6.3 but using crime and homicide rates per 1,000 for the independent variable instead of the count. Since population is used in the left-hand side to calculate rates, it is not used on the right-hand side.

Table A.11: Cartels and crime rates (Second Stage).

	Dependent variable:							
	Extortion Rate		Kidnapping Rate		Drugs Use Rate		Theft Rate	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Num. of cartels	0.004		0.025**		−0.007		10.200***	
	(0.020)		(0.011)		(0.008)		(3.106)	
Cartel dummy		0.005		0.037***		−0.011		14.817***
		(0.029)		(0.013)		(0.013)		(2.679)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Outcome mean	0.021	0.021	0.007	0.007	0.005	0.005	1.859	1.859
Outcome SD	0.074	0.074	0.041	0.041	0.037	3.723	3.723	
Observations	17,038	17,038	17,038	17,038	19,472	19,472	17,038	17,038

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the municipality level.

Table A.12: Cartels and homicide rates (Second Stage).

	Dependent variable:	
	CO-related homicide rate	
	(1)	(2)
Num. of cartels	0.216***	
	(0.063)	
Cartel dummy		0.394***
		(0.096)
Controls	Yes	Yes
Year FE	Yes	Yes
Outcome mean	0.073	0.073
Outcome SD	0.206	0.206
Observations	26,774	26,774

Note: *p<0.1; **p<0.05; ***p<0.01
Standard errors are clustered at the municipality level.

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