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Local Security Spending and the Presence of Criminal Groups in Mexico

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LOCAL SECURITY FUNDING AND THE PRESENCE OF CRIMINAL GROUPS IN MEXICO

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Abstract

What is the effect of local security spending on the presence of criminal organizations and violence in Mexico? I exploit the implementation of the *Subsidio para el Fortalecimiento del desempeño en materia de Seguridad Pública*, better known as FORTASEG as a natural experiment to estimate the effects of public security expenditures and the number of criminal organizations present in Mexican municipalities. I estimate difference-in-differences models using a 1990-2020 panel dataset of 1476 Mexican municipalities. The analysis shows that cities funded by FORTASEG and municipalities in the control group followed similar trends in criminal presence and violence prior to the program. However, since the implementation of FORTASEG in 2016 the number of criminal groups increased while homicides rates declined in awarded municipalities from 2016 to 2020.

I. Introduction

Since Mexico launched a major military offensive on drug trafficking and organized crime in 2006, the state has spent more than two hundred billion Mexican pesos, over a billion dollars in public security and counternarcotics policies.[1] Previous studies have shown that he deployment of security forces to exterminate criminal organizations and stop drug trafficking has often increased violence and enhanced the expansion of criminal organizations into diverse illegal activities such as extortion, kidnapping, human trafficking, and migrant smuggling, to name a few.[2]

Although the militarization of law enforcement has dominated the national security approach since 2006, the strategy has coexisted with other programs and policies aimed to improve local intelligence efforts and strengthen the capacities of local police forces. For decades, the federal government has assigned important amounts of public funds to local administrations to help them grow and maintain their security agencies.[3]

[1] "Transparencia Presupuestaria | Datos Abiertos," accessed July 28, 2022, https://www.transparenciapresupuestaria.gob.mx/en/PTP/Datos_Abiertos; Maritza Pérez, "Gasto En Seguridad Llegaría Hasta Los 2 Billones de Pesos," El Economista, accessed July 28, 2022, https://www.eleconomista.com.mx/politica/Gasto-en-seguridad-llegaria-hasta-los-2-billones-de-pesos-20191027-0094.html.

[2] Marcos Pablo Moloeznik, "Organized Crime, the Militarization of Public Security, and the Debate on the 'New' Police Model in Mexico," *Trends in Organized Crime* 16, no. 2 (June 1, 2013): 177–94, https://doi.org/10.1007/s12117-013-9186-4; Javier Osorio, "The Contagion of Drug Violence: Spatiotemporal Dynamics of the Mexican War on Drugs," *The Journal of Conflict Resolution* 59, no. 8 (2015): 1403–32; David Shirk and Joel Wallman, "Understanding Mexico's Drug Violence," *Journal of Conflict Resolution* 59, no. 8 (December 1, 2015): 1348–76, https://doi.org/10.1177/0022002715587049.

[3] Carlos Barranchina Barranchina Lisón, "Las Trampas de La Seguridad: El Gasto En Seguridad Pública En Municipios y Entidades Federativas Mexicanas, 2008-2015," Atlas de la Seguridad y la Defensa de México 2016, accessed July 27, 2022, https://casede.org/index.php/publicaciones/atlas-de-la-seguridad-y-la-defensa-de-mexico-2016/574-atlas-de-la-seguridad-y-defensa-2016; Gerardo Reyes Guzmán, Paola Hernández Victoria, and

Previous studies have analyzed the effects of the different allocations of public security funds on conventional crimes and violence but the impact of security expenditures in the presence of organized crime remains underexplored. What is the effect of local security spending on the presence of criminal organizations and violence in Mexico?

In 2016, the federal government created a special fund to support the modernization of local police bodies across the country. The *Subsidio para el Fortalecimiento del desempeño en materia de Seguridad Pública*, better known as FORTASEG went on from 2016 to 2020 and assigned approximately 5 billion pesos (around 250 million US dollars) to subsidy security efforts in almost 300 Mexican municipalities every year.

I exploit the case of FORTASEG as a natural experiment to estimate the effect of public security expenditures on criminal presence violence across Mexican municipalities. I compare the change over time in the number of criminal groups per municipality and homicides per 100,000 people between municipalities that received federal funds through FORTASEG and those that did not. Specifically, I estimate difference-in-differences models using a 1990-2020 panel dataset of 1476 Mexican municipalities.

I show that FORTASEG grantees and municipalities in the control group follow similar trends in criminal presence and violence prior to the program, and, since the implementation of FORTASEG in 2016, the number of criminal groups increased in awarded municipalities while homicides rates declined. The estimates are significant and encompass controls by observable municipal characteristics.

Drawing from literature on criminal violence, I suggest that increasing security expenditures at the local level, may affect the relationship between criminal groups and local authorities through the expansion of state sponsored protection rackets that attract criminal organizations and spark violent competition between rival groups. Further research could expand on the identification of these mechanisms.

In the next section, I present previous studies that analyze the effects of public spending on crime and violence in multiple regions of the world. In the third section, I describe the particular logics behind the operation of organized criminal organizations and present the mechanisms that link public spending, organized crime and violence. Later, I present the case of Mexico and describe FORTASEG in more detail. Next, I describe the data and the empirical strategy. Finally, I present the results and conclude with a discuss of the findings and avenues for future research.

II. Literature review: public security spending and crime

Studies linking public spending and criminal activity often follows a rational approach divided into two main explanations. First, studies look at positive determinants that generate incentives for individuals to remain within the boundaries of the law and licit markets. Scholars have looked

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Carlos Moslares García, "Gastos en seguridad y homicidios: los costos de la guerra contra el crimen organizado (2006-2012)," *Revista Mexicana de Opinión Pública* 18 (January 1, 2015): 92–111, https://doi.org/10.1016/S1870-7300(15)71362-1.

at the effects of public spending in education, welfare, inequality, and labor over crime rates and violence.[4]

Second, some studies analyze the dissuasive effects of increasing public spending to enhance the enforcement capacities of officials and security forces. Governments and state agencies often opt to increase public spending in security rather than social policy to hamper criminal activity and violence. The logic behind the investment of public funds in security lies behind the assumption that allocating resources to strengthen law enforcement as well as the expected severity of the sanctions will increase the opportunity costs for criminals to engage in illicit activities.[5] This group of studies is the most informative for the purposes of this text.

Previous scholars have analyzed the relationship between public security spending, crime and homicides with varying results in different countries around the world. In Greece, for instance, public the expenditure in security has grown steadily since the beginning of the 1990's, with a considerable peak prior to the Athens Olympic Games in 2004.[6] However, the investment of public resources for internal security in Greece did not reflect a reduction of criminal activity. Kollias et al. suggest that organizational deficiencies, and lack of proper police training may explain the ineffectiveness of the public funds allocated to public order in the country.[7]

In the case of Colombia, the public spending in defense, security and justice increased constantly from 1970 to 2000.[8] However, after reviewing multiple indicators of public safety, criminality, and the penal system in the country, González and Posada found that the effects of public spending were ineffective at the macro-level. According to the authors, the insignificant relationship between public spending and criminality is caused by unaligned incentives and lack of accountability among officials in the justice system and security forces.

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[4] Osvaldo Meloni, "Does Poverty Relief Spending Reduce Crime? Evidence from Argentina," *International Review of Law and Economics* 39 (August 1, 2014): 28–38, https://doi.org/10.1016/j.irle.2014.05.002; Ted Enamorado et al., "Income Inequality and Violent Crime: Evidence from Mexico's Drug War," *Journal of Development Economics* 120 (May 1, 2016): 128–43, https://doi.org/10.1016/j.jdeveco.2015.12.004; Pablo Fajnzylber, Daniel Lederman, and Norman Loayza, "Inequality and Violent Crime," *The Journal of Law & Economics* 45, no. 1 (2002): 1–39, https://doi.org/10.1086/338347; "Poverty, inequality and municipality's size as determinants of robbery in Mexico," 2021, http://www.gestionypoliticapublica.cide.edu/ojscide/index.php/gypp/article/view/812/226; Ryan S. Johnson, Shawn Kantor, and Price V. Fishback, "Striking at the Roots of Crime: The Impact of Social Welfare Spending on Crime During the Great Depression," Working Paper, Working Paper Series (National Bureau of Economic Research, January 2007), https://doi.org/10.3386/w12825; Lars Lindvall, "Does Public Spending on Youths Affect Crime Rates?," Working Paper (Working Paper, 2003), https://www.econstor.eu/handle/10419/82722; Raúl Aníbal Feliz et al., *Las bases sociales del crimen organizado y la violencia en México* (Centro de investigación y estudios en seguridad, 2012).

[5] Gary S. Becker, "Crime and Punishment: An Economic Approach," *Journal of Political Economy* 76, no. 2 (1968): 169–217; Isaac Ehrlich, "Participation in Illegitimate Activities: A Theoretical and Empirical Investigation," *Journal of Political Economy* 81, no. 3 (1973): 521–65.

[6] Christos Kollias, Nikolaos Mylonidis, and Suzanna-Maria Paleologou, "Crime and the Effectiveness of Public Order Spending in Greece: Policy Implications of Some Persistent Findings," *Journal of Policy Modeling* 35, no. 1 (January 1, 2013): 121–33, https://doi.org/10.1016/j.jpolmod.2012.02.004.

[7] Kollias, Mylonidis, and Paleologou.

[8] Francisco González and Carlos Esteban Posada, "Criminalidad, Violencia y Gasto Público En Defensa, Justicia y Seguridad En Colombia," *Revista de Economía Institucional* 3, no. 4 (2001): 78–102.

Vargas and García also analyze the trends of public security spending, violence and crime in Colombia.[9] Although their findings cannot be attributed directly to an isolated effect of a bigger security budget, the authors observe decreasing homicides figures in Colombia from 2001 to 2007. In contrast, non-violent crimes and felonies remained constant in the same period or, in the case of robberies, spiked alarmingly.[10] According to Vargas and García, the emphasis that the security strategy had on counter insurgency and counternarcotics over prevention and social welfare explains the divergent effects of security spending on violent and non-violent crime.

Loureiro and Carvalho analyze the relationship between security spending and indicators of crime and security at the state level.[11] The authors find a robust negative relationship between security spending and homicides rate, and argue that public investment in security at the local level is an important factor for crime reduction. However, their results suggest that socioeconomic indicators like inequality, unemployment, and education have a greater effect on hampering the levels of violence.[12]

In her study, Gomes further validates the results of Loureiro and Carvalho[13] by extending the period of analysis and addressing endogeneity issues between local crime levels and security spending in Brazilian states.[14] In line with the results from Loureiro and Carvalho, Gomes founds a significant negative relationship between public spending and the homicides rate per 100,000 people.[15]

The effect of police funding, gun violence and criminality has been a constant political debate in the United States, and the issue has regained strength in the past few years due to events of excessive use of police force and increasing crime rates in the country.[16] In their study, Chalfin et al. measure the effectiveness of public security spending by looking at the number of arrests of police forces in the United States.[17] The authors find that larger police forces reduce homicides victimization in total, meaning that investment in police expansion have positive effect in homicide arrests. However, the effect of larger police bodies on arrests for regular crimes is negative.[18]

Although the study of Chalfin et all does not directly look at the effects of security spending on crime or violence, it is informative because it shows how public funds that generate

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[9] Alejo Vargas Velásquez and Viviana García Pinzón, "Seguridad Ciudadana y Gasto Público: reflexiones sobre el caso colombiano," *América Latina Hoy* 50 (2008), https://doi.org/10.14201/alh.1339.
[10] Velásquez and Pinzón.
[11] André Oliveira Ferreira Loureiro and José Raimundo de Araújo Carvalho Júnior, "O impacto dos gastos públicos sobre a criminalidade no Brasil," 2007, http://www.repositorio.ufc.br/handle/riufc/1039.
[12] Loureiro and Carvalho Júnior.
[13] Loureiro and Carvalho Júnior.
[14] Camila Gomes, " ," Working Paper (IDB Working Paper Series, 2018), https://doi.org/10.18235/0001365.
[15] Gomes.
[16] Shaila Dewan, "'Re-Fund the Police'? Why It Might Not Reduce Crime.," *The New York Times*, November 8, 2021, sec. U.S., https://www.nytimes.com/2021/11/08/us/police-crime.html.
[17] Aaron Chalfin et al., "Police Force Size and Civilian Race," Working Paper, Working Paper Series (National Bureau of Economic Research, December 2020), https://doi.org/10.3386/w28202.
[18] Chalfin et al.

larger police bodies can increase indicators of effectiveness to prosecute homicidal crimes[19], which could increase the opportunity costs for individuals to engage in this kind of behavior.

In his work, Saud looks directly at the relationship between local security spending and crime rates in over a hundred American cities from 1985 to 2014.[20] He finds a positive significant relationship between a city's police spending and violent crimes per 100,000 people.[21] Next to Chalfin et al's study, Saud's results suggest that, while larger police bodies may be more effecting in arresting offenders, this does not translate into less criminal activity. In contrast, local expenditure in police bodies seems to be positively correlated with crime.

In another case study of the United States, Mello exploits a natural experiment given by a federal subsidy for the Community Oriented Policing Services program (COPS), which granted funds for police hiring to local governments.[22] His results suggest that public investment for local crime prevention was significant in the reduction of robbery, auto theft and murders in comparison to those cities that did not receive the fund.[23] This is perhaps the study that resembles the most the analysis proposed in this text for the case of FORTASEG in Mexico.

Several scholars, think tanks and organizations in Mexico have analyzed the allocation of public resources for security and their effects on crime and violence[24]. The Mexican case is interesting because the armed forces have assumed a leading role in law enforcement, relegating local and federal civil security bodies to auxiliary and less primary duties.[25] Hence, studies focused on Mexico have mainly looked at the differences between the funds received by military and civil personnel and their effects on organized crime and violence.

Reyes Guzmán et al, for instance, look at the relationship between public security spending and homicides from 2000 to 2012.[26] This period is interesting because it covers two different federal administrations with two different security approaches, one more militarized (2006-2012) than the other (2000-2006). Additionally, the public spending for public security and national defense was 2.4 times bigger in the second administration.[27]

Overall, the authors find that public security spending in the period from 2006 to 2012 has a positive and significant relationship with the homicides rate per 100,000 as a total as well as divided by the different security forces: military, navy, federal police, and local public

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[19] Chalfin et al.
[20] Ramzi Saud, "Police Killings, City Spending, and Violent Crime," Medium, April 18, 2021, https://towardsdatascience.com/police-killings-city-spending-and-violent-crime-61754788482b.
[21] Saud.
[22] Steven Mello, "More COPS, Less Crime," *Journal of Public Economics* 172 (April 1, 2019): 174–200, https://doi.org/10.1016/j.jpubeco.2018.12.003.
[23] Mello.
[24] Administrador, "Reporte Ethos: Descifrando el gasto público en seguridad | Ethos," accessed July 22, 2022, https://www.ethos.org.mx/ethos-publications/reporte-ethos-descifrando-gasto-seguridad/; Mariana Campos, "Seguridad Pública en el PEF 2022: más gasolina para la militarización," *México Evalúa* (blog), October 21, 2021, https://www.mexicoevalua.org/seguridad-publica-en-el-pef-2022-mas-gasolina-para-la-militarizacion/.
[25] Moloeznik, "Organized Crime, the Militarization of Public Security, and the Debate on the 'New' Police Model in Mexico."
[26] Reyes Guzmán, Hernández Victoria, and Moslares García, "Gastos en seguridad y homicidios."
[27] Reyes Guzmán, Hernández Victoria, and Moslares García.

security.[28] These results contrast with the previous period where all the categories show negative significative relationships between security spending and homicides rate. The evidence from the study suggests that, beyond the increase in public security funds, the militarization of law enforcement is an important determinant of violence.[29]

As an effort to provide a fine-grained analysis of the effect of public funds and violence in Mexico, Arens analyses municipal revenue and spending to test the argument that organized criminal violence intensifies as criminal groups compete for access to local resources.[30] He finds that higher levels of local spending per capita are significantly related to higher homicide rates. However, the results do not show a predicting effect of higher homicides when local public funds are higher.[31]

Although the studies mentioned above give important insights about the influence of public security spending on criminal behavior, they only focus on the frequency of crime and violence and miss other important aspects of criminal activity like its geographical distribution, the multiple kinds of criminal actors, and their varying relationships with state officials.

By looking the effects of local security funding over the presence of criminal organizations, the goal of this text is to add to the existing literature in at least three areas. First, the study aims to increase the level of specificity that can help identifying clearer connections between security funding and organized crime rather than overall criminal activity. Second, an analysis that focuses on organized criminal groups gives room to tell a story that does not assume that the relationships between security forces, state officials and criminals are monolithic. Several studies on organized crime in Mexico have documented varying levels of corruption and symbiosis that exists between public officers and organized criminal groups, however, the analyzes described above do not necessarily acknowledge this variation and assume that security expenditures will invariably result in stronger security agencies that are more effective in dissuading criminal activity. Incorporating literature specific to organized crime allows to diversify this story and contemplate other dynamics that can exist between criminals and the state.

Finally, studying local expenditure for public safety in Mexico is interesting because it occurs in the context of a heavily militarized law enforcement strategy. This situation can help understandings the effects of two coexisting security approaches and expenditures: national defense and public safety. In the next section, I describe dynamics that are particular to organized criminal groups and introduce past studies that have identified specific explanations for the transformation, expansion and evolution of criminal groups in Mexican territory. This is necessary to understand the logics behind the expansion, and transformation of criminal groups and illicit markets.

[28] Reyes Guzmán, Hernández Victoria, and Moslares García.
[29] Reyes Guzmán, Hernández Victoria, and Moslares García.
[30] Helge Arends, "The Decentralisation of Death? Local Budgets and Organised Crime Violence," *Journal of Public Policy* 41, no. 4 (December 2021): 706–30, https://doi.org/10.1017/S0143814X20000239.
[31] Arends.

III. What makes organized crime different? illicit markets and law enforcement

Activities and offenses that can be categorized as organized crime have always been present in human societies but it was until recent times that scholars and governments began to classify and analyze this behavior separately. The term "organized crime" was first introduced in the United States to describe the activities of criminal groups and gangs present in Chicago during the 1920s[32] but only until 2003 the nations of the world agreed on a definition for organized criminal group. According to the United Nations Convention against Transnational Organized Crime, an organized criminal group is:

- a group of more than three people that was not randomly formed;
- existing for a period of time;
- acting in concert with the aim of committing at least one crime punishable by at least four years incarceration;
- in order to obtain directly or indirectly, a financial or other material benefit.[33]

This definition encompasses all profit motivated criminal activities carried out by an organized group of people.[34] A crucial difference between organized and conventional crime is that —in many cases— organized criminal groups must keep their markets open and attractive to customers who benefit from illicit goods and services. For that reason, criminal groups usually resort to corruption seeking tolerance from authorities and police officials.[35]

Unlike conventional criminal offenders, organized criminal groups and their activities can be compared to those of firms. Similar to legitimate businesses, criminal organizations aim to maximize their utilities through the strategic allocation of resources and prices. Criminals prefer larger market shares and less competition, and are affected by government regulations, law enforcement and changes in the global economy.[36]

Criminal organizations have incentives to gain monopolistic power over illicit markets to push up the prices of illegal goods and services and maximize their profits. Hence, criminal groups will attempt to weaken their competitors or generate alliances to take full organizational power of the market.[37] In other words, criminal organizations aim to become regulators of their own industries either through corruption or violence.

State prosecution and trends in law enforcement play a significant role in determining conditions in which criminals compete and engage in illicit activities. Evidence shows that monopolistic market structures and lower levels of violence are more likely in contexts of low

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32 Klaus von Lampe, "Not a Process of Enlightenment: The Conceptual History of Organized Crime in Germany and the United States of America," *Forum on Crime and Society* 1 (January 1, 2001): 99–116.
33 "United Nations Convention against Transnational Organized Crime," United Nations: Office on Drugs and Crime, 5, accessed July 24, 2022, //www.unodc.org/unodc/en/organized-crime/intro/UNTOC.html.
34 "The Globalization of Crime - A Transnational Organized Crime Threat Assessment," United Nations: Office on Drugs and Crime, 25, accessed July 24, 2022, //www.unodc.org/unodc/en/data-and-analysis/tocta-2010.html.
35 "The Globalization of Crime - A Transnational Organized Crime Threat Assessment," 25.
36 "Task Force Report: Organized Crime, Annotations and Consultants' Papers | Office of Justice Programs," accessed July 8, 2022, https://www.ojp.gov/ncjrs/virtual-library/abstracts/task-force-report-organized-crime-annotations-and-consultants.
37 "Task Force Report: Organized Crime, Annotations and Consultants' Papers | Office of Justice Programs."

law enforcement.[38] With lower security interventions, the opportunities for potential competitors to exploit the breakdown on the dominant groups are limited and the control of the illicit markets is more likely to remain centralized.[39]

In contrast, frequent security interventions, particularly those aimed to arrest or execute criminal leaders, are likely to increase the number of criminal organizations and change the relative power of criminal groups, resulting in higher levels of violence.[40] The fragmentation of criminal organization that results from aggressive and lethal law enforcement produce what scholars call a 'cottage industry' of multiple small, loose, and decentralized criminal groups dispersed across territories and jurisdictions.

Besides the intensive law enforcement, the presence and operation of organized criminal groups —unlike overall criminal activity— is closely determined by political and social structures. The case of Mexico has been constantly analyzed in this regard. Over the last few decades, the political changes in Mexico have unsettled the arrangements between criminals and state actors, and modified criminal dynamics and activities.[41] The democratization process that started in the 1980's weakened the political monopoly of the PRI (*Partido Revolucionario Institucional*) and all the local political arrangements that created a favorable environment for criminal organizations to carry out their activities protected by corrupt officials.[42]

The PRI functioned as a nationwide protection racket[43] that allowed criminal groups to operate in determined jurisdictions without worrying for state intervention and rival competition. In exchange, criminals paid protection fees to government agents.[44] With party alternance in the federal and local governments, it was hard for new officials to show enough capacity to secure protection taxes, or they resisted to participating in protection rackets. Hence, in many places criminal groups were left to their own resources to secure control over illicit markets and territories, resorting to the use of violence. Since then, the 'geography of organized crime' in Mexico has been in constant flux.[45]

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[38] John E. Eck and Jeffrey S. Gersh, "Drug Trafficking as a Cottage Industry," in *Illegal Drug Markets: From Research to Prevention Policy. Crime Prevention Studies Volume 11, Criminal* (Justice Press, 2000), 241–72.
[39] Eck and Gersh.
[40] Laura H. Atuesta and Aldo F. Ponce, "Meet the Narco: Increased Competition among Criminal Organisations and the Explosion of Violence in Mexico," *Global Crime* 18, no. 4 (October 2, 2017): 375–402, https://doi.org/10.1080/17440572.2017.1354520; Brian J. Phillips, "How Does Leadership Decapitation Affect Violence? The Case of Drug Trafficking Organizations in Mexico," *The Journal of Politics* 77, no. 2 (April 1, 2015): 324–36, https://doi.org/10.1086/680209; Gabriela Calderón et al., "The Beheading of Criminal Organizations and the Dynamics of Violence in Mexico," *Journal of Conflict Resolution* 59, no. 8 (December 1, 2015): 1455–85, https://doi.org/10.1177/0022002715587053; Osorio, "The Contagion of Drug Violence."
[41] Richard Snyder and Angélica Durán Martínez, "Drugs, Violence, and State-Sponsored Protection Rackets in Mexico and Colombia," *Colombia Internacional*, April 19, 2017, https://doi.org/10.7440/colombiaint70.2009.03; Guillermo Trejo and Sandra Ley, *Votes, Drugs, and Violence: The Political Logic of Criminal Wars in Mexico*, Cambridge Studies in Comparative Politics (Cambridge: Cambridge University Press, 2020), https://doi.org/10.1017/9781108894807; Viridiana Rios, "How Government Coordination Controlled Organized Crime: The Case of Mexico's Cocaine Markets," *Journal of Conflict Resolution* 59, no. 8 (December 1, 2015): 1433–54, https://doi.org/10.1177/0022002715587052.
[42] Luis Astorga and David A. Shirk, "Drug Trafficking Organizations and Counter-Drug Strategies in the U.S.-Mexican Context," 2010, https://escholarship.org/uc/item/8j647429.
[43] Snyder and Martínez, "Drugs, Violence, and State-Sponsored Protection Rackets in Mexico and Colombia."
[44] Shirk and Wallman, "Understanding Mexico's Drug Violence."
[45] Shirk and Wallman.

In the context of democratization, political pluralism made it harder for authorities to govern and agree on one security approach, whether it is to confront or protect criminal organizations.[46] Scholars have looked at the the varying levels of coordination[47] and fragmentation[48] between different levels of governments to measure capacity of the state to effectively enforce the law or secure protection rackets.

However, unlike regular crime, the task to detects and combat organized crime often depends on the capacity of the security agencies to engage in longer term investigations and intelligence work that requires personnel with advanced training and skills to recognize activities that are clandestine and hidden by nature. Even for highly capable security forces coordinated governments, the ability to identify and prosecute organized crime is often an additional duty beyond the workload coming from responding to conventional crime and citizen complains.

Finally, another set of studies suggests that unlike conventional crime, organized crime tends to form and develop whenever there's a vacuum of power that can be exploited by criminal organizations.[49] Skaperdas identifies four general causes of power vacuums: geographic conditions, prohibitionist policies, major political changes, or ethnic differences that hamper law enforcement.

IV. Public security, organized crime and violence in Mexico

As mentioned before, an important difference between conventional and organized crime is that organized criminal groups can be understood as rational "for-profit" actors that engage in violent behavior as a means to control market shares, compete against rivals, and respond to state prosecution and law enforcement with the ultimate goal to increase their benefits. Hence, the relationship between the presence of criminal groups and violence is very close.

In the case of Mexico, multiple studies have found evidence that the dramatic increase of violence that the country has experiences in the last couple decades is in large part a result of the multiplication of criminal organizations that followed the militarization of public security in the early 2000's.[50]

During the so called "war on drugs" that started in 2006, the Mexican president Felipe Calderón ordered the deployment of national armed forces to combat drug trafficking and organized crime in Mexico.[51] By December of 2006, 6,500 troops had occupied the state of Michoacán with the

[46] Shirk and Wallman.
[47] Rios, "How Government Coordination Controlled Organized Crime."
[48] Angelica Duran-Martinez, "To Kill and Tell? State Power, Criminal Competition, and Drug Violence," *Journal of Conflict Resolution* 59, no. 8 (December 1, 2015): 1377–1402, https://doi.org/10.1177/0022002715587047.
[49] Stergios Skaperdas, "The Political Economy of Organized Crime: Providing Protection When the State Does Not," *Economics of Governance* 2, no. 3 (November 1, 2001): 173–202, https://doi.org/10.1007/PL00011026.
[50] Phillips, "How Does Leadership Decapitation Affect Violence?"; Laura H. Atuesta and Aldo F. Ponce, "Meet the Narco: Increased Competition among Criminal Organisations and the Explosion of Violence in Mexico," *Global Crime* 18, no. 4 (October 2, 2017): 375–402, https://doi.org/10.1080/17440572.2017.1354520; Shirk and Wallman, "Understanding Mexico's Drug Violence."
[51] Phillips, "How Does Leadership Decapitation Affect Violence?"

goal to eradicate organized criminal groups and, by the end of 2011, a total of 45,000 troops were involved in the battle against drug trafficking organizations all over the country.[52]

The extensive military deployment was followed by an increasing number of detained and executed drug lords.[53] In 2007, the Mexican government published the list of the 37 most wanted kingpins and by the beginning of 2009 the security forces had already captured 20 of them[54]. The militarized security strategy that began in 2006 was characterized by its lethality. [55]

Besides those criminals who were detained, multiple drug dealers were executed by law enforcers. The number of narcotraffickers arrested increased from 203 to 1670 between 2007 and 2011, while the number of executed criminals went from 60 to 1753 in the same period.[56] Over the past couple decades, the decapitation of criminal organizations caused the fragmentation of the major cartels into smaller and often more violent groups that have diversified their markets and activities while competing for larger territories.[57]

Overall, the arguments and explanations concur in the assertion that, due to new political arrangements and an aggressive militarized public security strategy, criminal organizations in Mexico were forced to evolve and change the relations between them and with state agencies. This transformation was necessary in order to face a more aggressive context of state confrontation. In this research I aim to analyze the effect of public security expenses at the local level in the process of expansion and transformation of organized in Mexico.

V. FORTASEG and public security spending in Mexico.

The Mexican government invests on security, public safety and justice through multiple agencies and funds at the national, state and local levels. In the past decade, the structure of the whole security apparatus in Mexico experienced multiple transformations that aimed to respond to the increasing corruption among security officials, growing levels of violence, and the multiplication of organized criminal groups in the country.[58]

At the national level, the Mexican security apparatus has gone through two important transformations in recent years: the militarization of law enforcement and the unification of

[52] Calderón et al., "The Beheading of Criminal Organizations and the Dynamics of Violence in Mexico," December 1, 2015.
[53] Phillips, "How Does Leadership Decapitation Affect Violence?"; Atuesta and Ponce, "Meet the Narco," October 2, 2017.
[54] Gabriela Calderón et al., "The Beheading of Criminal Organizations and the Dynamics of Violence in Mexico," *Journal of Conflict Resolution* 59, no. 8 (December 1, 2015): 1455–85, https://doi.org/10.1177/0022002715587053.
[55] Atuesta and Ponce, "Meet the Narco," October 2, 2017.
[56] Atuesta and Ponce.
[57] Phillips, "How Does Leadership Decapitation Affect Violence?"; Calderón et al., "The Beheading of Criminal Organizations and the Dynamics of Violence in Mexico," December 1, 2015; Atuesta and Ponce, "Meet the Narco," October 2, 2017.
[58] Carlos Barranchina Lisón, "Las Trampas de La Seguridad: El Gasto En Seguridad Pública En Municipios y Entidades Federativas Mexicanas, 2008-2015," Atlas de la Seguridad y la Defensa de México 2016, accessed July 27, 2022, https://casede.org/index.php/publicaciones/atlas-de-la-seguridad-y-la-defensa-de-mexico-2016/574-atlas-de-la-seguridad-y-defensa-2016; Reyes Guzmán, Hernández Victoria, and Moslares García, "Gastos en seguridad y homicidios"; Administrador, "Reporte Ethos"; Campos, "Seguridad Pública en el PEF 2022."

police bodies.[59] In line with these two reforms, the national budget assigned to armed forces and national security has grown steadily over the past decade. From 2014 to 2022, the federal budget for national defense (army and navy) went from 122 billion Mexican pesos to 141.2 billion in 2022.[60] Additionally, the budget assigned to the recently stablished national guard (unified police body) went from .9 billion pesos when it was created in 2019, to 62 billion in 2022. Together, the national guard and the armed forces concentrate more than 204.7 billion pesos in 2022.[61]

In contrast, the federal the federal funds that support local police bodies are almost extinct, limiting the development of local security agencies to the municipal and state governments and their resources.[62] Unlike the budget assigned to national forces, federal transfers to state and municipal security efforts have declined in the past decade. In 2009 local governments receive 21.6 billion pesos to spend on security, their amount in 2022 was just about 8 billion.[63]

Federal funds for local security have existed in Mexico since the 1990's. After the creation of the National Public Security System (SNSP),[64] the federal government implemented two programs that support the development of infrastructure and equipment of the different police forces in Mexico. *The Fondo de Aportaciones para la Seguridad Pública* (FASP) directed to state governments, and the *Fondo de Aportaciones para el Fortalecimiento de los Municipios* (FORTAMUN) were established in 1997 and 1998 respectively.

Although the federal budget assigned has decreased, both mechanisms are still in place and they constitute the only federal contributions specifically labeled for local security that remain today.[65] Besides this fund, the federal government implemented additional subsidies to help modernize, train, and professionalize local police bodies.[66]

The *Subsidio para el Fortalecimiento del desempeño en materia de Seguridad Pública*, better known as FORTASEG was one of the federal subsidiary programs for local security improvement.[67] The program ran from 2016 to 2020 and, although FORTASEG was not the first of its kind, it was the first one that stablished clear formulas for selecting the benefited municipalities and a cap for the number of beneficiaries. Additionally, the program differed from previous federal funds in that the main goal of the subsidy was not focused on improving infrastructure and equipment, but in reducing corruption among police officials, improving their training and

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[59] "Del mito del mando único a la realidad de las policías locales," *Animal Político* (blog), accessed July 25, 2022, https://www.animalpolitico.com/lo-que-mexico-evalua/mando-unico-realidad-las-policias-locales/.
[60] "Transparencia Presupuestaria | Datos Abiertos."
[61] "Transparencia Presupuestaria | Datos Abiertos."
[62] Campos, "Seguridad Pública en el PEF 2022."
[63] Campos.
[64] Barranchina Lisón, "Las Trampas de La Seguridad: El Gasto En Seguridad Pública En Municipios y Entidades Federativas Mexicanas, 2008-2015."
[65] "Transparencia Presupuestaria | Datos Abiertos."
[66] Barranchina Lisón, "Las Trampas de La Seguridad: El Gasto En Seguridad Pública En Municipios y Entidades Federativas Mexicanas, 2008-2015."
[67] Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública, "Programa de Fortalecimiento para la Seguridad FORTASEG," gob.mx, accessed July 27, 2022, http://www.gob.mx/sesnsp/acciones-y-programas/programa-de-fortalecimiento-para-la-seguridad-fortaseg.

working conditions, and enhancing the creation of datasets and digital tools that supported the enforcement activities of local security agencies.[68]

FORTASEG gave especial priority on information technologies. The program was justified on six priorities of the federal government:

1. Development and professionalization of local police forces.
2. The creation of a national information system for public security.
3. Implement and develop the penal justice system.
4. Improve the information technologies for police operations.
5. Support the national call center for emergencies and crime reports.
6. The design of policy for violence prevention.

The funding was limited to a maximum of 300 municipalities selected through an eligibility formula that considered variables like population, crime rates, and the ratio between police officials and the size of the population. State capital cities and municipalities marked as touristic were given eligibility priority.[69]

The total funds granted through FORTASEG ranged from 5,465.80 million pesos in 2016 to 3,921.70 million in 2020. On average, each beneficiary received between 13.71 and 18.22 million.[70] The funds were transferred among municipalities following a distribution formula that considered, population, evaluation of the current state of security agencies, crime rates, and effectiveness of law enforcement. The total budget of the program, the number of beneficiaries and the assigned funds vary each year, however, the figures remained close enough to exploit the program as a natural experiment. The analysis explores the effect of local funding for security on criminal presence in a sample of municipalities that followed similar trends before the period of implementation of FORTASEG.

Local and national security agencies in Mexico

Beyond the difference in budgets, the dynamics and structures of local and national security bodies in Mexico are completely different from one another. Being at the the level of administration that is closest to the people, local police departments are in charge of being the first responders to civil reports and maintain close contact with citizens. This closeness gives local security bodies privileged access to information and knowledge on the social and criminal dynamics of their communities, which allows them to be crucial in the implementation of security strategies.

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[68] Carlos Barranchina Lisón, "Las Trampas de La Seguridad: El Gasto En Seguridad Pública En Municipios y Entidades Federativas Mexicanas, 2008-2015," Atlas de la Seguridad y la Defensa de México 2016, accessed July 27, 2022, https://casede.org/index.php/publicaciones/atlas-de-la-seguridad-y-la-defensa-de-mexico-2016/574-atlas-de-la-seguridad-y-defensa-2016.

[69] "DOF - Diario Oficial de La Federación," accessed July 27, 2022, https://www.dof.gob.mx/nota_detalle.php?codigo=5584605&fecha=23/01/2020#gsc.tab=0.

[70] Pública, "Programa de Fortalecimiento para la Seguridad FORTASEG."

In contrast, armed forces and heavily armed national police bodies like the national guard focus on violent crimes and large-scale operations like the arrest of the leaders of drug cartels and drug seizures. In contrast to local police corps, they do not respond to citizen reports and they are not trained and, in most cases, not even authorized to engage with civilians. Despite the difference in their duties and training, local police bodies, armed forces and federal police have to coexist in Mexico which has created a very especial and sometimes chaotic security context.

VI. Data

I compiled annual information from all 2,446 Mexican municipalities from 1990 to 2020. I look at Mexican municipalities as the spatial units of analysis due to the long history that criminal groups in Mexico have basing their activities at the local levels, corrupting and combating local officials. Additionally, criminal groups engage with local communities in both "benign" and violent dynamics, as providers of illicit goods and services, as well as local bandits. Municipalities are also the administrative territories that are closest to civilians, hence, they are the closest government units in which to assess the effects of security spending.

I chose the years from 1990 to 2020 as the period of study because it allows to consider the effect of the transition to democracy in Mexico, which can be traced back to the late 1980's and early 1990's when the autocratic party PRI started losing state and municipal elections. As mentioned before, federal transfers to state and local governments for security expenditures started to be officially implemented in the mid 1990's after the creation of the National Public Security System (SNSP).[71] Data on municipal budget and finances are only available up to 2020, the same year that FORTASEG was lastly implemented, hence, 2020 is the final year of analysis.

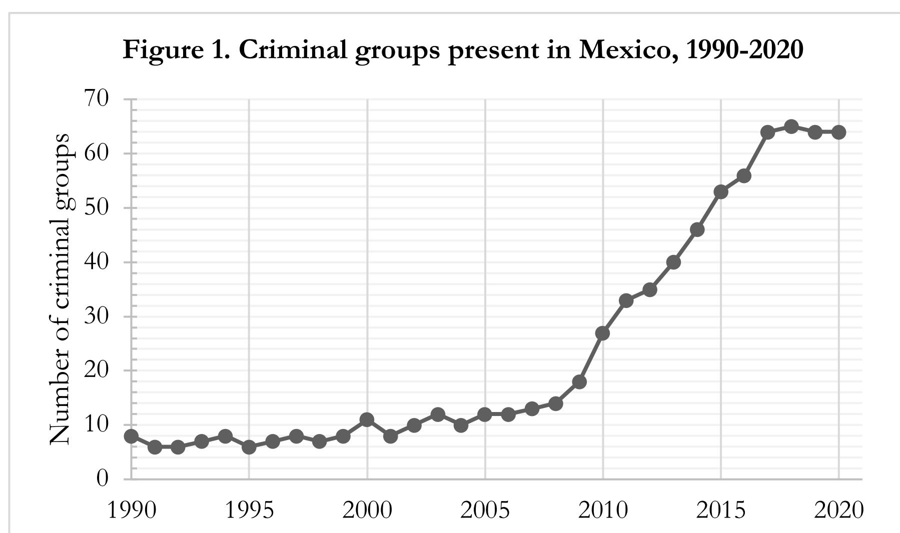


Figure 1. Criminal groups present in Mexico, 1990-2020

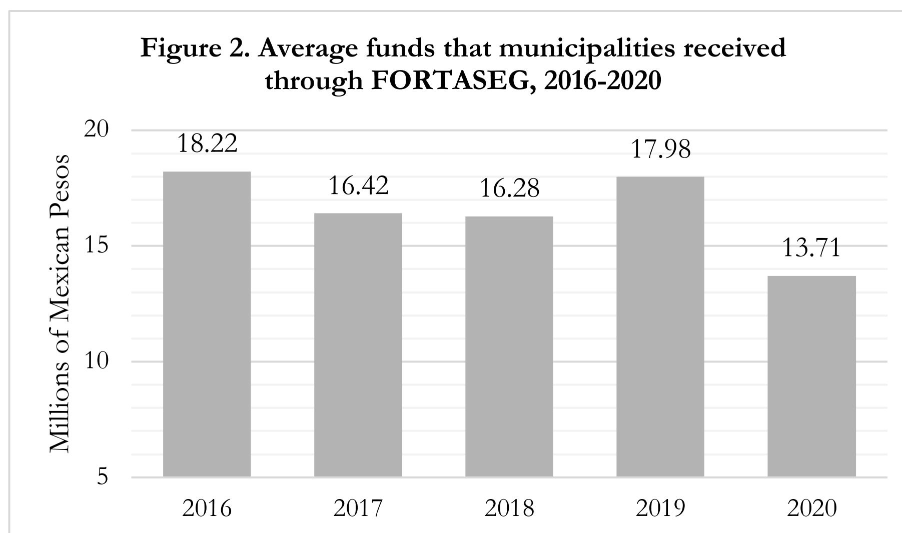
Presence of criminal organizations

Data on the presence of criminal organizations was collected by Sobrino Macías[72] and contains

[71] Barranchina Lisón, "Las Trampas de La Seguridad: El Gasto En Seguridad Pública En Municipios y Entidades Federativas Mexicanas, 2008-2015."

[72] Fernanda Sobrino, "Mapping Criminal Organizations," Fernanda Sobrino, September 1, 2019, https://www.fersobrino.com/dataproject/mco/.

the number of criminal organizations existing in every Mexican municipality each year from 1990 to 2020. Sobrino Macías gathered the information through an algorithm that analyzed and collected information from millions of press articles available online. The method identified criminal organizations and their members and geolocalized each detected group.[73] The total number of criminal groups present in a municipality. The numbers go from 0 to 39 groups identified, with a yearly average varying between 0.045 in 1990 to 1.99 groups in 2020.



FORTASEG

The Mexican Ministry of the Interior provided information on the municipalities that met the criteria to receive funds from FORTASEG each year from 2016 to 2020, as well as the amounts of money that each city received.[74] Although the fund was available for a maximum of 300 local governments, only 252 municipalities received FORTASEG throughout the complete duration of the program (2016-2020). The 48 municipalities that did not receive the fund all 4 years were omitted from this analysis to prevent contamination of the control and treatment groups.

The main explanatory variable or treatment is a dichotomic variable with the value of 1 if the municipality received funds from FORTASEG every year from 2016-2020. The variable takes the value of 0 if the municipality never received the subsidy. On average, municipalities received between 13.71 and 18.22 million pesos every year through FORTASEG.

Observable municipal data

I also account for demographic, economic and social data at the municipal level including total population, homicides rate per 100,000 people, total municipal spending, levels of inequality, and militarization. Standard demographic and economic data were obtained from the National Institute of Statistics and Geography (INEGI). Data on

Sample construction

The main analysis focuses on the municipalities that received funds from the FORTASEG program since 2016. It is important to note that, all the recipients from FORTASEG registered

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[73] Sobrino.
[74] Pública, "Programa de Fortalecimiento para la Seguridad FORTASEG."

the presence of at least one criminal organization in the period of study. Hence, I drop 970 municipalities for which there is no registry of criminal presence since 1990. This cutoff aims to identify the effect of the subsidy on criminal presence and violence by balancing the control group. The remaining 1476 municipalities comprise the analysis sample, and represent the 60% of the municipalities in Mexico.

Characteristics of the sample

The sample includes 1476 Mexican municipalities of which 336(22%) received funds from FORTASEG in at least one of the 5 years of the program operation. 161 (11%) of the sampled municipalities benefited from FORTASEG all 5 years. Municipalities in the sample are home to approximately 75% of the Mexican population and are distributed across all 32 states.

The characteristics of the sample are presented in Table 1. The average city has about 125,000 habitants, and spends approximately 350 million pesos every year. Cities in the sample receive on average 123 million pesos from the federal government and register an average Gini coefficient of .41, below the national value of .45 in 2020. The table also includes the average number of confrontations between armed forces (army and navy), the federal police, and organized criminal organizations. These variables aim to account for levels of militarization in each municipality.

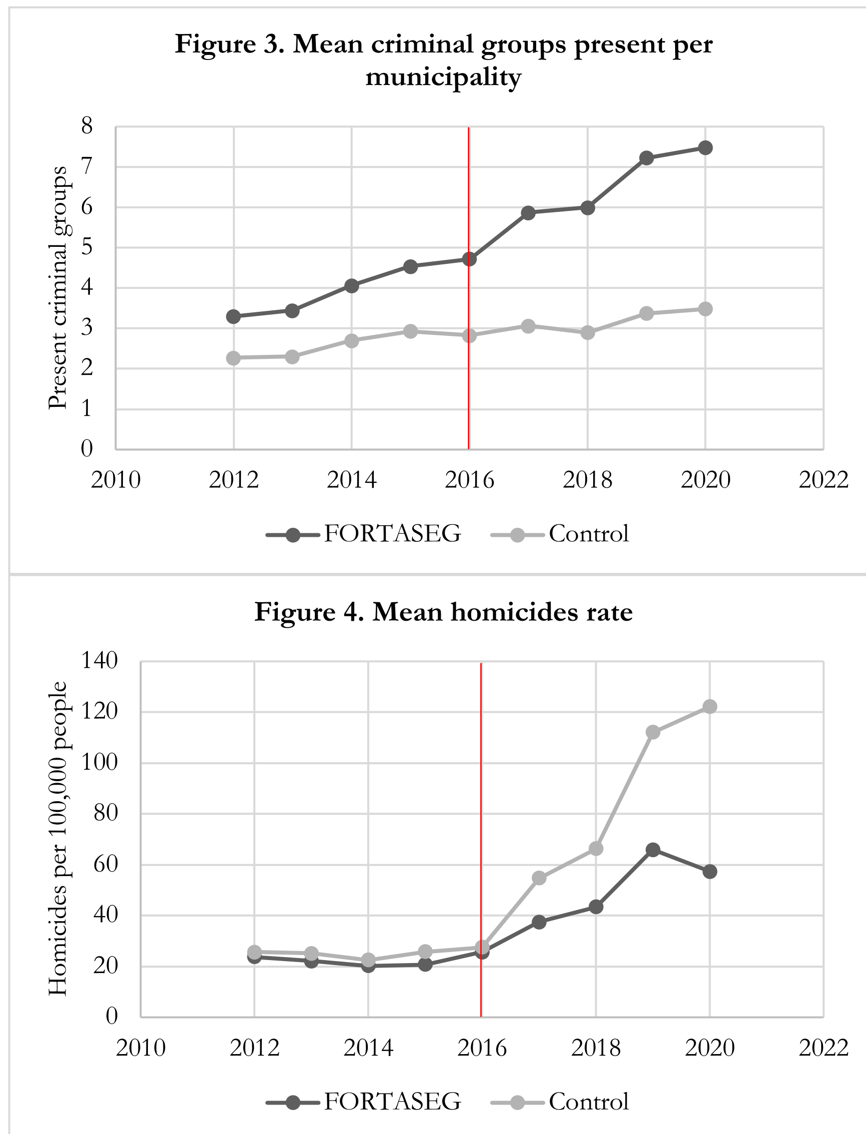
Table 1. Descriptive statistics of Mexican municipalities in the analyzed sample

	Control	**FORTASEG recipients**	**Sample total**
Total population	105,164.3	305,547	125,640.6
	(219,477.8)	(401,684.1)	(251,805.1)
Organized criminal groups	2.94	7.17	3.37
	(2.83)	(6.28)	(3.59)
Homicides per 100,000 people	63.44	45.09	61.56
	(995.57)	(208.39)	(945.69)
Municipal spending	259,000,000	1,150,000,000	350,000,000
	(555,000,000)	(1,420,000,000)	(745,000,000)
Received federal budget	88,500,000	426,000,000	123,000,000
	(188,000,000)	(558,000,000)	(272,000,000)
Gini coeficient	0.4168583	0.4149148	0.4166597
	(0.0560997)	(0.0309021)	(0.0540685)
OCG vs Federal police	0.0217093	0.0425926	0.0238433
	(0.2575847)	(0.3134914)	(0.2639004)
OCG vs Armed forces	0.355675	0.4564815	0.365976
	(2.61773)	(3.418853)	(2.710453)

The characteristics of the sample are presented in Table 1. The average city has about 125,000 habitants, and spends approximately 350 million pesos every year. Cities in the sample receive on average 123 million pesos from the federal government and register an average Gini coefficient of .41, below the national value of .45 in 2020. The table also includes the average

number of confrontations between armed forces (army and navy), the federal police, and organized criminal organizations. These variables aim to account for levels of militarization in each municipality.

Cities that received funds from FORTASEG differ from those that did not in almost every observable characteristic aside from the levels of inequality. The average FORTASEG grantee municipality houses over 305 million people and reports a homicides rate close to 45 homicides per 100,000 people; number below the figures of the total sample and the control group. Municipalities that got FORTASEG funds received on average four times more than those municipalities within the sample that did not get the subsidy. Finally, on average, FORTASEG grantees register more confrontations between security forces and criminal groups.



Although municipalities in the treatment (FORTASEG) and control groups present generalized differences in observable variables, the presence of criminal groups and levels of violence follow similar trends in both groups of cities before the implementation of FORTASEG and divergent directions after the application of the subsidy in 2016. Figure three

shows that the average number of criminal organizations present in a municipality progressed at the same pace in treatment and control groups before 2016. From 2016 onwards, the figure flattens in the control group but increases at a faster rate in those municipalities that received funds from FORTASEG.

Figure 4 shows that in the case of the homicides rate, the cities follow pretty much the same trend before the implementation of FORTASEF, but diverge sharply in the period after the program was first implemented. Homicides rates rapidly increase in the municipalities that did not receive the federal funds, but slowly increase and even decrease among FORTASEG grantees after the program was put into effect. Both, Figures 3 and 4, suggest an effect of the subsidy on the number of criminal organizations and the homicides rates among cities that received FORTASEG.

Before analyzing the particular effects of the subsidy on criminal presence, I review the relationships between FORTASEG and the number of criminal groups through an ordinary least squared regression. table 2 summarizes the results. Overall, the models suggest a positive and significative relationship between receiving funds from FORTASEG and the number of criminal groups present in a city. The total municipal public spending and the Mexican border with the United States are also positively related to the number of criminal organizations. Finally, the first and third models how a negative relationship between the number of criminal groups and homicides rate for municipalities in the sample, however, this relationship is not statistically significant.

Table 2. FORTASEG, municipal spending and presence of organized criminal groups

Number of organized criminal groups	**Model 1**	**Model 2**	**Model 3**
FORTASEG		**3.031*** **	**2.413*** **
		(0.253)	(0.234)
Total municipal spending (log)	**1.507*** **		**1.323*** **
	(0.123)		(0.104)
Homicides per 100,000 people	-2.10e-06	3.09e-05	-8.51e-06
	(2.95e-05)	(3.07e-05)	(2.59e-05)
Total population (log)	**-0.309*** **	**0.690*** **	**-0.372*** **
	(0.0796)	(0.0734)	(0.0702)
Gini coeficient	**-6.902*** **	**-8.820*** **	**-7.202*** **
	(1.342)	(1.336)	(1.222)
Gulf of Mexico	-0.135	-0.151	-0.164
	(0.532)	(0.468)	(0.508)
USA border	**1.591*** **	**1.422*** **	**1.608*** **
	(0.494)	(0.532)	(0.502)
Pacific Ocean	1.346**	1.319**	1.342**
	(0.541)	(0.540)	(0.534)
Constant	**-18.88*** **	**-0.754**	**-14.97*** **
	(1.841)	(0.640)	(1.560)
Observations	9,638	10,569	9,638
Number of cve_entmun	1,363	1,470	1,363

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Empirical strategy

The goal of the analysis is to compare the change over time in the presence of organized criminal organizations in Mexican municipalities that met the requirements to receive the funds from FORTASEG (treatment group) and those cities below the funding cutoff. I exploit the natural experiment created by the distribution of FORTASEG from 2016-2020 using a difference-in-differences design. I estimate the following equation.

$$Y_{it} = \beta_0 + \beta_1 post_{it} + \beta_2 treat_{it} + \delta_{dd}(post_{it})(T_{it}) + \beta\beta_3 x_{it1} + \cdots + \beta_k x_{itk} + \varepsilon_i$$

Where Y_{it} is equal to the outcome effect of the implementation of FORTASEG on the number of organized criminal groups. $treat_{it}$ is a dummy variable with the value of 1 if the municipality received funds from FORTASEG, $post_{it}$ is a dummy variable with the value of one if the observation happened after the treatment period (year > 2016). Finally, $\beta\beta_3 x_{it1} + \cdots + \beta_k x_{itk}$ refers to observable control variables that are common across the treatment and the control groups, or those municipalities that received FORTASEG and those that did not.

As should be clear from the description of the subsidy and the sample construction, I do not assume that the funds from FORTASEG were assigned randomly. The identifying assumption to justify the diff-in-diff strategy is that the trends of criminal presence and homicides rate would have been similar between beneficiaries and non-beneficiaries of the program.[75] This assumption is pertinent because, as shown in figures 3 and 4, the variables of interest followed common trends prior to the implementation of FORTASEG but differed once the program started.

VII. Results

Table 3 shows the main difference-in-differences estimates. The first estimation presented in column 1 suggests that the number of criminal groups present in FORTASEG grantees increase by 2.093 over the period from 2016 to 2020. The estimate is highly significant. Column 2 shows the estimates for a further specification of the first model which includes controls for observable variables across time in all municipalities in the sample. The controls include: population, total municipal spending, Gini coefficient, and location of the municipality in a drug trafficking route (Gulf of Mexico, the Pacific Ocean, and the northern border). The estimate of the second specification is lower than the previous one but remains positive and highly significant. The coefficient suggests that the number of criminal groups in the treated municipalities increased by 1.65 from 2016 to 2020.

I also analyze the effect of FORTASEG on the homicides rate. Columns 3 and 4 show the difference-in-difference estimates for a model without controls and one that considers the variation in observable municipal characteristics. Both coefficients are negative but not strongly significant. On column 3, the estimate suggests a decrease of 79.85 homicides per 100,000 from

[75] Danny Yagan, "Capital Tax Reform and the Real Economy: The Effects of the 2003 Dividend Tax Cut," *American Economic Review* 105, no. 12 (December 2015): 3531–63, https://doi.org/10.1257/aer.20130098.

2016 to 200 in the municipalities that received funds from FORTASEG. The same figure in the second model is 76.985.

The results are intriguing because literature on criminal violence has identified a clear relationship between the presence of criminal groups and violence in Mexico. However, the estimations of this study describe the opposite relationship between criminal presence and violence for the municipalities that received funds from FORTASEG in the between 2016 and 2020. In other words, the estimations presented in table 3 suggest that, while the number of criminal groups increased in the treated municipalities, the homicides rate decreased. Drawing from literature on criminal violence, I propose an explanation of why this might be the case.

Table 3. Implementation of FORTASEG and the number of criminal organizations per municipalities.

	Criminal groups		Homicides rate	
	1	**2**	**3**	**4**
Before				
Control	2.215	2.805	33.75	112.178
Treated	(3.433)	(2.415)	(18.897)	(102.603)
Diff (T-C)	**1.218*** **	**-0.39*** **	-14.853	-9.575
	(0.086)	(0.83)	(24.139)	(27.209)
After				
Control	3.176	3.682	138.387	215.073
Treated	(6.487)	(4.994)	(43.676)	(128.514)
Diff (T-C)	**3.311*** **	**1.262*** **	**-94.712*** **	**-86.559*** **
	(0.108)	(0.101)	(30.418)	(33.335)
Diff-in-Diff	**2.093*** **	**1.653*** **	**-79.858** **	**-76.985* **
	(0.138)	(0.12)	(38.832)	(39.88)

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Besides using additional resources to increase their capacity and make law enforcement a credible threat, local security forces could use federal subsidies to forge credible protection rackets to let criminal groups operate freely and shield them from external competition in exchange of fees. [76] Higher capacities allow officials to enlarge the protection racket while maintaining a credible threat of enforcement if the criminals don't abide by the agreed behavior. Under this logic, criminal organizations would be more attracted to operate in municipalities where police bodies have more resources and capacity to build stronger protection rackets, increasing the number of criminal groups within their jurisdiction.

[76] Snyder and Martínez, "Drugs, Violence, and State-Sponsored Protection Rackets in Mexico and Colombia."

This logic is also helpful to understand the increasing homicides rate. Municipalities with stronger police forces that are able sponsor solid protection rackets may destabilize illicit economies by increasing the number of organizations that must compete for markets shares and utilities. Hence, instead of hampering competition, a state sponsored protection racket may attract criminals interested in operating under an enforcement free arrangement. Increasing competition, is related to higher levels of violence, since criminal groups resort to killings to protect their markets and intimidate potential competitors.[77]

In the case of Mexico, other variables may also impact the levels of homicide, like the political competition at the different levels of government,[78] the degree of militarization that a municipality experience and the presence of state institutions and security forces.[79] It is work for future research to test the arguments described above and account for the interaction between local, regional and national security forces in the combat against criminal violence in Mexico.

VIII. Conclusion

Many studies have analyzed the effects of public security spending on crime and violence in different regions of the world. However, most of these analyzes have focused on conventional crime while more complex forms of criminal behavior remained understudied. This paper adds to the literature by exploring the relationship between public security spending and the presence of organized criminal groups and violence at the local level.

Although the activities of criminal groups vary widely, these organizations have been conceptualized as for-profit actors that engage in illicit activities to obtain financial benefits. Because of the clandestine their clandestine nature, criminal groups often corrupt state officials and security forces to maintain the operation of illicit markets and allow their coexistence with legitimate institutions. This text explores the role of public security spending on criminal presence with the aim to inform how solvency may impact the relationship between criminals and public officials.

Specifically, I exploit the implementation of FORTASEG as a natural experiment to estimate the causal effect of public security expenditures on the presence of criminal groups in Mexico. My identification strategy is based on the fact that funds from FORTASEG were distributed through formulas that evaluated the capacity of Mexican municipalities to take advantages of the grants.

I compare the change over time in criminal presence and homicides rates in cities that received the subsidy and a subset of municipalities that did not qualified for the grants. The

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77 Shirk and Wallman, "Understanding Mexico's Drug Violence"; Atuesta and Ponce, "Meet the Narco," October 2, 2017; Calderón et al., "The Beheading of Criminal Organizations and the Dynamics of Violence in Mexico," December 1, 2015.

78 Rios, "How Government Coordination Controlled Organized Crime"; Guillermo Trejo and Sandra Ley, "Why Did Drug Cartels Go to War in Mexico? Subnational Party Alternation, the Breakdown of Criminal Protection, and the Onset of Large-Scale Violence," *Comparative Political Studies* 51, no. 7 (June 1, 2018): 900–937, https://doi.org/10.1177/0010414017720703; Trejo and Ley, *Votes, Drugs, and Violence*; Duran-Martinez, "To Kill and Tell?"

79 Osorio, "The Contagion of Drug Violence."

underlying assumption is that municipalities that did not received the funds are a valid control group for those that received the subsidy. I show that criminal presence and violence followed similar trends among all municipalities in the sample before the implementation of the program in 2016. Trends diverge as subsidized cities received the federal funds.

The estimates calculated in the statistical analysis imply that the number of criminal groups increased between 1.65 and 2.09 among the municipalities that received funds from FORTASEG between 2016 and 2020. Conversely, the estimates suggest that the homicides rate per 100,000 people decreased by 76 to 79 in the cities granted with FORTASEG.

I argue that the divergent trends that followed the implementation of FORTASEG can be understood by looking at different dynamics in the relationships between criminal groups and state officials. The results demand further studies that come up with identification mechanisms for state sponsor protection rackets and the interaction between different security forces at varying levels of government. The results of this article are relevant to the degree that they highlight that fiscal support to local security efforts may decrease levels of violence, at the probable expense of increasing criminal presence.

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