INTERNATIONAL MONETARY FUND

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Violent Crime and Insecurity in Latin America and the Caribbean

A Macroeconomic Perspective

Prepared by Paul M. Bisca, Vu Chau, Paolo Dudine, Raphael Espinoza, Jean-Marc Fournier, Pierre Guérin, Niels-Jakob Hansen, and Jorge Salas

Under the guidance of Luis Cubeddu and Rodrigo Valdés

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Executive Summary

Violent crime and insecurity remain major barriers to prosperity in Latin America and the Caribbean (LAC). With just 8 percent of the global population, LAC accounts for a third of the world's homicides. Recent regional surveys show that crime is a top concern for citizens: one in five people reports to be a victim of a crime, and 30 percent of respondents identify crime and insecurity as the main challenge facing their country. Insecurity harms citizens, but also the economy by undermining investment, productivity, and growth (World Bank 2011; IMF 2023), with high economic and social costs (Jaitman 2017). Violent crime and insecurity are therefore macro-critical in LAC.

Building on the existing literature, this paper delves deeper into the links between crime, insecurity, and the macroeconomy for LAC. Acknowledging that drivers and manifestations of crime are complex and inter-linked, the paper aims to support economic policymakers and development partners by shedding further light on the interplay between insecurity and macroeconomic outcomes, with an emphasis on the relationship between violent crime and growth, investment, and public finances. The analysis finds that:

- *While violent crime and insecurity are key issues at the national level, for most countries aggregate indicators mask huge internal disparities*: The variance of per capita homicide rates is 10 times higher between municipalities than across LAC countries. Granular geographic data show that homicides tend to be clustered in areas near national borders, key transportation infrastructure, and coastal areas. Violent crime is also more prevalent in cities and regions where populations are younger and less educated.

- *Violent crime hurts the economy and private sector development*: Nightlight data show that, at the municipal level, a 10 percent increase in homicides lowers economic activity, by around 4 percent. This implies that halving homicide rates could boost activity at the local level by an average of 30 percent, although aggregate effects at the national level are likely to be smaller since crime leads to relocation of economic activity. Spikes in crime can contract activity quickly. A 10 percentage point increase in the share of crime-related news—an innovative measure of insecurity used in this paper—is associated with a 2.5 percent contraction in industrial production three quarters following the news spike. Meanwhile, crime is a key obstacle to doing business in many areas: 30 percent of firms perceive rampant crime as their key problem, and direct costs—calculated as the value of losses due to crime and firms' spending on security—are estimated at around 7 percent of annual sales. Crime diminishes labor productivity, while high security costs lower the probability of firms investing in innovation. Small enterprises are the most vulnerable to the deleterious effects of crime.

- *Organized crime is especially costly*: The presence of gangs and drug trafficking amplify the costs of doing business. A novel analysis of Mexican firms suggests that the damage costs of crime are four times higher for firms that report gangs operating in their vicinity.

- *Violent crime rises with macroeconomic instability, inequality, and governance problems*: In LAC, a recession increases homicides by up to 6 percent on average, an effect not observed in other regions. A spike in inflation above 10 percent is associated with a 10 percent increase in homicides, on average, in the following year. A one standard deviation increase in the Gini coefficient is associated with a 12 percent increase in homicides. Victimization surveys show that where populations are concerned with the rule of law—impunity and police corruption—only one in five victims file their case with the police. Lack of trust and crime can be mutually reinforcing.

▪ *While spending on security in the region is significant, it is generally inelastic to crime*: Spending on public order and safety averages around 1.9 percent of GDP (over 7 percent of overall spending), although it tends not to react to changes in crime, suggesting that increases in security spending may be difficult to reverse. The fiscal burden may be higher where the military is also charged with domestic security provision. While spending more on security and deploying more police seems to contribute to lowering crime, other factors are likely more important in LAC, with spending efficiency playing a critical role. For example, despite a high proportion of spending on the judiciary, the courts' ability to punish crimes remains weak.

These findings highlight the importance of security for economic development, and thus for economic policymakers and development partners. Measures that promote macroeconomic stability, inclusive growth, access to job opportunities for young workers, and improvements in the rule of law can address drivers of violent and organized crime. Economic policies may also mitigate the cost of crime or maximize returns from lower criminality especially through improvements in monitoring and policy coordination across levels of government. Meanwhile, given the complexities and potential spillovers of violent crime, stronger cooperation between governments, international financial institutions, UN agencies, development partners, academics, and civil society is essential to develop evidence-based data, analytics, and policy lessons.

In line with the literature, the paper also emphasizes the need for effective and accountable criminal justice institutions to fight crime. Combating corruption in the police and judiciary can boost trust in the administration of justice and in turn increase filing rates and reduce crime impunity. Police and judicial cooperation across levels of government is key especially where organized crime is pervasive, often corrupting government institutions. Strengthening international cooperation against illicit drugs, arms trafficking, and money laundering by enhancing intelligence sharing and coordinating joint operations would also help reduce the profitability of organized crime and the accessibility of firearms. Measures to strengthen the overall rule of law and reduce rent-seeking opportunities would also yield an economic dividend, fostering investment and growth.

Finally, the fiscal burden of security spending underscores the need for ministries of finance to systematically monitor and enhance the efficiency of resources allocated to public order and safety, in partnership with line ministries in the security sector. Cross-country analysis based on historical patterns suggests that reducing homicides by solely scaling up spending on public order and safety will likely prove expensive, suggesting the need for a more integrated and comprehensive approach that enhances the effectiveness of public order and safety spending and prioritizes social investments needed to address long-standing drivers of violent crime. Drawing on past experiences in the region, public expenditure reviews that assess whether government spending patterns are consistent with policy priorities and public financial management standards can help facilitate dialogue on the sustainability and impact of responses to violent and organized crime.

The paper draws important policy lessons and highlights areas for additional research and collaboration. Going forward, there is tremendous scope to leverage the expertise and comparative advantages of policymakers across sectors, academics, civil society, and development partners to reduce crime and insecurity. Importantly, while local circumstances matter, more needs to be done to learn from cross-country experiences. Serious consideration should be given to the establishment of a regional knowledge platform supporting data collection, exchange, and analysis (including in public financial management) as well as the dissemination of best practices on effective economic and security policy responses to crime and violence.

Acronyms and Abbreviations

IDB . . . . Inter-American Development Bank

LAC. . . . . Latin America and the Caribbean

POS . . . . public order and safety

1. Introduction

Violent crime affects Latin America and the Caribbean (LAC) more than any other region in the world, with dramatic consequences for its socioeconomic development. Widespread violent crime leads to loss of life and assets; reduces opportunities to fulfill economic, social, and individual potential; and diminishes trust in institutions. Insecurity also adds to the costs and complexities of doing business.

Against this backdrop, and building on the seminal work of Becker (1968), a rich literature has aimed at assessing the costs of crime, identifying its drivers, and evaluating policies to address crime. The Inter-American Development Bank (IDB) provided a comprehensive analysis of the costs of crime in LAC (Jaitman 2017) and the World Bank issued a report on the relationships between demographics, development, and criminality, and the role of crime prevention policies (Chioda 2017). Dell, Feigenberg, and Teshima (2019) linked economic and labor market shocks to incentives to partake in criminal activity, while Schargrodsky and Freira (2021) examined the robust relationship between inequality and crime. Urbanization, informality, and territorial development also play a key role in explaining crime, especially in LAC, where about 25 percent of the urban population lives in low-income informal settlements lacking title and access to basic services (Alvarado and Muggah 2018). This favors the concentration of "pockets of fragility" as cities or territories where populations are subject to extremely weak state capacity and vulnerable to organized crime or different criminal forms of governance and service provision (IDB 2024).

This paper complements these efforts by focusing on the nexus between violent crime, insecurity, and the macroeconomic factors that may intensify or alleviate their impact. Much like others in the literature, it uses the occurrence of homicides as a proxy to violent crime,[1] although the paper also analyzes victimization surveys, reports on the presence of organized crime, and a new dataset on the perceptions of crime and violence.

The paper is guided by three questions: (1) What macroeconomic factors amplify or mitigate violent crime in the region? (2) What is the effect of violent crime and insecurity on macroeconomic outcomes? (3) How can economic policymakers support policies that aim to tackle these challenges effectively? To investigate these questions, Chapter 2 provides an overview of insecurity challenges in LAC and related economic and social costs, drawing on the existing academic and policy literature. Chapter 3 delves deeper into the geography of homicides in LAC, and into the impacts of rising homicide rates on economies at the local level. Chapter 4 explores a novel news-based measure of crime that is available at high frequency, and which can be used to monitor the impact of insecurity on economic activity. Chapter 5 focuses on how episodes of negative growth, high inflation, inequality, and poor governance are associated with violent crime. In Chapter 6, the analysis turns to the effects of insecurity and organized crime on the private sector, including the costs of doing business in areas affected by crime. Chapter 7 focuses on the fiscal implications of government spending on public order and safety (POS) in LAC, examining regional trends, composition, and effectiveness of security expenditures. Chapter 8 concludes with policy lessons and recommendations for national authorities, international partners, and key stakeholders, suggesting areas for future work, collaboration, and research.

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[1] Although definitions often vary by jurisdiction, violent crime usually includes robbery, assault, domestic violence, sexual violence, hate crime, gang violence, and homicides. Homicides, however, are the most egregious form of violence, and its definition is the most homogenous across countries. It also represents a good proxy for violence and insecurity: for every homicide, 20 to 40 nonfatal acts of violence, requiring medical intervention, are committed (WHO 2004).

2. Insecurity Challenges in Latin America and the Caribbean

By the measure of homicides, LAC is the region most affected by violent crime: with just 8 percent of the global population, LAC accounts for 29 percent of homicides worldwide (130,000 homicides; Igarapé Institute 2024). The average murder rate in the past decade is almost 12 times that of advanced economies, 8 times larger than in emerging markets, and around 3 times the world average (Figure 1, panel 1). Eight out of the ten most violent countries in the world and 40 of the 50 most dangerous cities are located in LAC (Muggah and Aguirre 2024; Igarapé Institute 2024).

Aggregate trends tend to mask considerable heterogeneity between countries, with homicide rates in 2023 exceeding 30 per 100,000 in several Caribbean countries, but under 10 per 100,000 in other countries, including Chile and Peru. Brazil, Colombia, and Mexico, which host around 60 percent of the region's population, account for 70 percent of the region's homicides. While the median homicide rate in the region has been generally stable over the past decade, there have been important variations over time, in some countries (Figure 1, panel 2). Between 2001 and 2020, Colombia experienced significant improvements, especially in cities once known as organized crime epicenters, such as Cali and Medellin. In recent years, El Salvador witnessed the sharpest decline in homicides in the region, following the intensification of security operations against gangs (Muggah and Aguirre 2024). This was complemented by measures to strengthen cooperation between the judiciary and the police and to fight narcotrafficking and gun trafficking. Meanwhile, Ecuador is experiencing an unprecedented escalation in lethal violence, owing largely to competition between drug trafficking groups (UNODC 2023a). Migration and gangs spreading across borders are also contributing to concerns in the region. For instance, gangs spreading from Venezuela have been related to an increase in

Figure 1. Crime and Violence in Latin America and the Caribbean

Despite being at peace, the region is the most violent in the world.

1. Homicides across the World
(Homicide rates per 100,000 people, 2015–21 average)
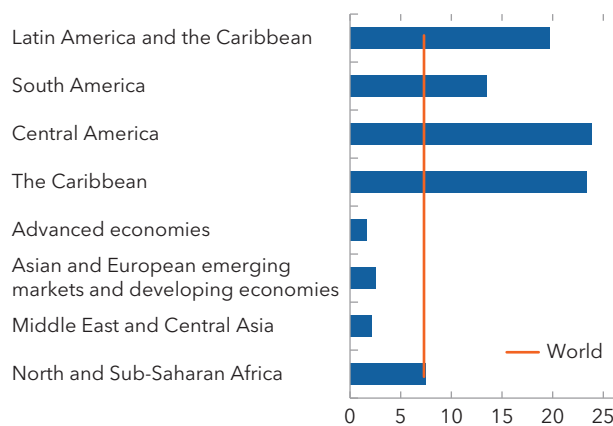
2. Homicides in Latin America and the Caribbean
(Homicide rates per 100,000 people, 2001–23)
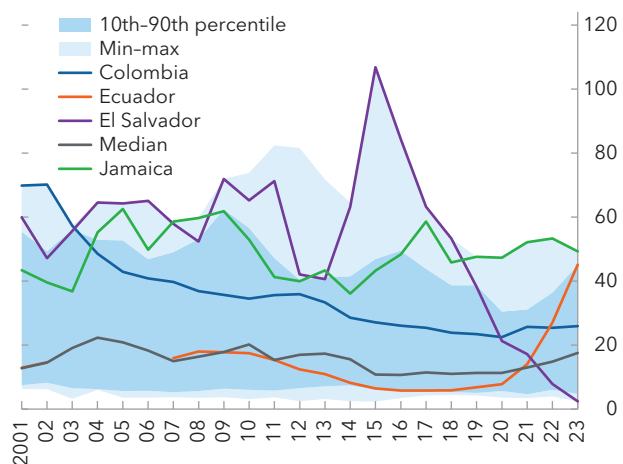
Sources: Igarapé Institute; offcial sources; UN Survey of Crime Trends and Operations of Criminal Justice Systems (2023e); and IMF staff calculations.
Note: For panel 2, the 10th–90th percentile range includes between 11 and 16 countries over the period, depending on data availability.

kidnappings in Chile (Manjarrés and Cavalari 2024), and homicides and sexual assault against Venezuelan migrants drove the rise in crime rates in Colombia near the border (Knight and Tribin 2023). These recent experiences are inspiring a debate on state responses to violent crime (Montoya 2023).

Not surprisingly, regional surveys show that insecurity is a top concern for citizens. Up to 30 percent of people identify crime and insecurity as the main challenge facing their country (Latinobarómetro 2023). These trends are below the peak levels of the 2010s, but concern about crime is on the rise since the COVID-19 pandemic (Figure 2, panel 1). About one in five people reported they were a victim of crime in 2021, including theft, assault, and extortion (Figure 2, panel 2), with dramatic consequences on victims' lives and prospects—for instance, intentions to emigrate are higher among victims of crime and police corruption (LAPOP 2023).

Furthermore, almost half (46 percent) of all respondents confirmed they felt unsafe in their neighborhood, with women reporting higher numbers than men (Lupu, Rodriguez, and Zechmeister 2021). Gender-based violence is especially problematic, with over 4,000 women being victims of feminicide—gender-related intentional killing—in 2022 (ECLAC 2023). Sexual and psychological abuses are also widespread with about 25 percent of women in Latin America experiencing intimate partner violence during their lifetime (PAHO 2018). These rates are especially high in some countries (Pispira, Cevasco, and Silva 2022) and, although measurement is made difficult by underreporting, they appear to have increased during the COVID-19 pandemic (UN Women 2021), with implications for women's workforce participation (De Hoop, Tribín, and Velásquez 2024).

Homicide and victimization data reveal the complex relationship between homicides, other forms of crime, and perceptions of safety, as well as the challenges of finding accurate and reliable metrics. Jamaica's murder rate is among the highest in LAC (Figure 1, panel 2) but its victimization rate as reported in surveys is among the lowest (Figure 2, panel 2). In Chile, although homicides have increased by 46 percent between 2021 and 2022 (Nicolodi and others, 2022) and 30 percent of citizens report being victims of crime (Pulso Ciudadano 2023), the reported homicide rate remains low (6.3 per 100,000 people in 2023, similar to the

Figure 2. Crime Victimization and Public Perception

About 20 percent of the population report they are victims of crime, which is a top-of-mind issue for citizens.

1. Perception that Crime and Insecurity Are the Main Problems Facing the Country
(Percentage of respondents)
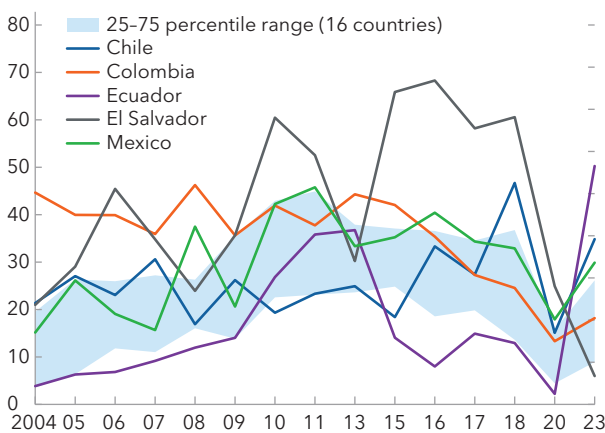
2. Self-Reported Victims of Crime
(Percent of the population)
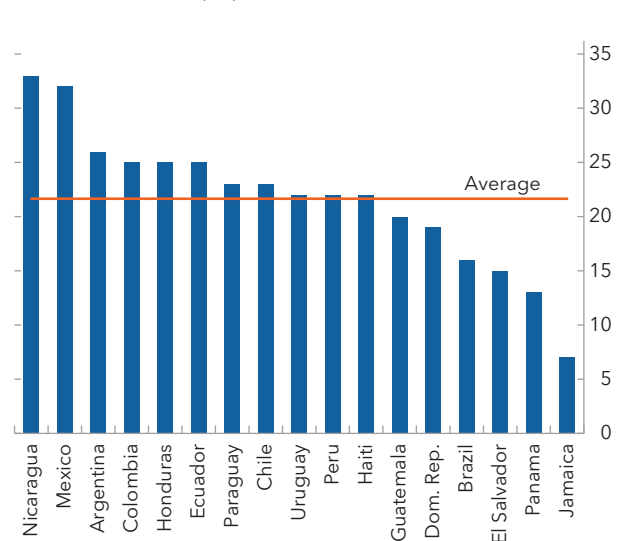
Sources: Latinobarómetro (2023); and Lupu, Rodriguez, and Zechmeister (2021).

United States). Meanwhile, in Mexico there is no correlation between homicide rates and the prevalence of other violent crimes as reported by victimization surveys at the state level, and only a modest correlation between perception of insecurity and these two crime dimensions (IMF 2024).

Such divergences between different metrics of insecurity suggest that statistical analyses need to be interpreted with caution and accompanied by sensitivity analysis using other metrics. While homicide data is a fairly reliable proxy for various types of violent crime, it may differ from the perception of crime—which could be instead related to news on crime rather than crime itself. These nuances underscore the policy challenges of addressing the sense of insecurity—in addition to lowering violent crime itself—as a key variable that affects the quality of life of the population in the region (Abizanda and others 2012). For instance, research in the United States has shown that the sense of insecurity persists in communities where actual levels of violent crime have come down, and especially in areas that have not experienced crime directly (Cordner 2010).

A. Drivers and Economic Ramifications of Crime

Violent crime and insecurity in LAC stem from a constellation of domestic and external factors. To start, understanding crime in the region requires delving into the region's long history of political violence, civil wars, past authoritarian rule, and pervasive corruption, all of which have undermined the rule of law (see Box 1; World Bank 2011) and hampered development. Socioeconomic factors remain a key driver of crime, including income and institutional development levels, growth and unemployment, as well as structural factors such as inequality, poverty, education, informality, and other demographic factors[2] (see Annex 1).

Insecurity is also heavily affected by organized crime—planned and rational criminal acts perpetuated by groups of individuals (UNODC 2024a) (Figure 3, panel 1; Box 1). Organized criminal groups and gangs are linked to 50 percent of the homicides in the region, more than twice the world average. This connection

Figure 3. Organized Crime and Drugs in Latin America and the Caribbean

Central America and South America are heavily affected by organized crime, while cocaine production is at unprecedented levels.

1. Global Organized Crime Index
(Index)
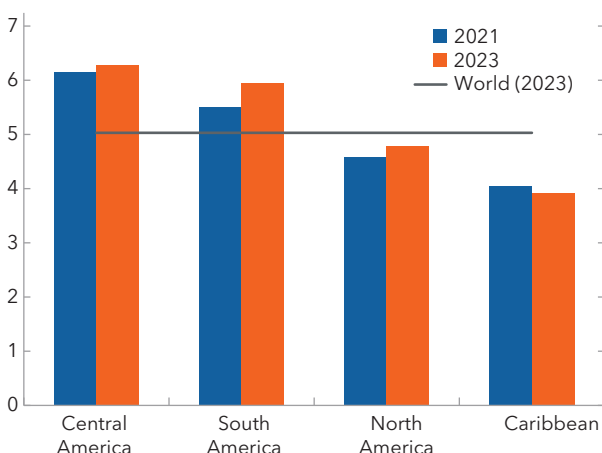
2. Cultivation of Coca Bush and Global Cocaine Seizures (2010–21)
(Hectares cultivated, left scale; tons, right scale)
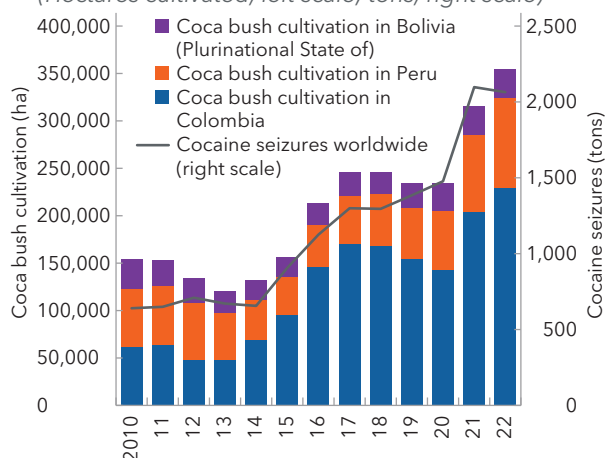
Sources: Global Initiative Against Transnational Organized Crime; and UNODC (2023c).
Note: The Global Organized Crime Index measures criminality and resilience for each country on a scale of 1 to 10.

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[2] Based on local data in Brazil and Mexico, Dix-Carneiro, Soares, and Ulyssea (2018) and Dell, Feigenberg, and Teshima (2019) find a significant relationship between weaker labor market conditions and higher homicide rates.

is particularly strong in areas where criminal organizations compete for the control of markets, thereby increasing homicides (UNODC 2023b), and competition has been fueled by the rise in cocaine production (Figure 3, panel 2). There is growing evidence of transnational organized narcotrafficking groups expanding operations into illegal gold mining, logging, and wildlife trafficking in the Amazon basin. Illicit activities often require convergent crime, such as corruption, extortion, fraud, money-laundering, violent assault, or sexual violence (UNODC 2023d). Organized crime may even manage to corrupt high-level politicians, the military, or law enforcement officials, leading in some cases to state capture by the mafia (Naím 2012).

In the Caribbean, elevated homicide rates have been driven by a combination of rising drug production from South America, the proliferation and competition of transnational and local gangs, and the high availability and use of firearms (UNODC 2024a)—another related driver of homicides (about 70 percent of homicides in LAC are perpetrated using firearms in 2021, compared to 47 percent globally; UNODC 2023b). These trends further underscore the need for comprehensive responses that can effectively identify and address the drivers of violent crime.

In addition to saving lives, policies that successfully prevent, deter, or suppress crime would yield significant economic benefits. These include:

- *Supporting growth*: Lowering LAC's homicide rate would boost the region's GDP growth, through higher capital accumulation and total factor productivity (IMF 2023a; Machado Parente and Valdés 2023). Reducing gender-based violence would also increase female employment and growth (Ouedraogo and Stenzel 2021).

- *Cutting costs and improving resource allocation*: Crime leads to direct costs, such as loss of lives, reduced quality of life due to victimization, increased government spending on POS, and security expenses in the private sector. The sum of these direct costs—which represent only a fraction of the actual burden of crime and violence—is estimated at 3.5 percent of GDP, on average in LAC, annually (Perez-Vincent and others 2024; Jaitman 2017), with much higher costs in countries with high crime rates.

Box 1. The Complex Roots of Violence in Latin America and the Caribbean

Violence in Latin America and the Caribbean (LAC) is a long-standing and complex phenomenon. Since colonial times, different layers of violence—political violence, civil wars, organized crime, state violence, targeted violence against specific socioeconomic groups—have intersected and mutually intensified, both synchronically and dynamically (Ferry 2012). The manifestation of these layers has included mass killings, targeted assassinations, forced disappearances, and human rights abuses. Structural factors such as extractive- and commodity-dependent economies; a weak state; corruption, including in the police and judiciary; poverty and inequality; unresolved social problems; or the geopolitical landscape have facilitated the emergence of these layers (World Bank 2011). At the same time, violence has contributed to perpetuating some of these structural factors. Examples of these layers and their interactions include the following:

- *Organized crime and drug trafficking*: Organized crime is one of the main contributors of crime in LAC, as the recent uptick in violence in Ecuador has shown. Often, organized crime profits from the trafficking of drugs destined to the United States via the Central America/Mexico corridor (UNODC 2023c), and drug trafficking also makes gangs more violent (Rodgers 2007; Rocha 2007). The consequences of organized crime go beyond the direct economic and social costs, as it adds another level of complexity to the dynamics of violence and criminal governance (see the review of Feldmann and Luna 2022). In Colombia, the coexistence of organized crime and internal conflict has created complementarities that have made it more difficult for the state to combat drug trafficking, guerrilla forces, and stop the paramilitaries. Drug trafficking provided direct and indirect financing to guerilla and paramilitary groups, strengthening them. At the same time, paramilitary groups sold territorial protection to drug cartels. Drug lords, in addition to fueling corruption and undermining the rule of law, committed acts of terrorism against civilians and targeted assassinations against politicians and civil servants aimed at curbing the government fight on drug and drug cartels (Davis 2021).

- *Unresolved social issues*: Many countries in LAC still face long-standing unresolved social issues, in particular the lack of integration of indigenous populations, land tenure and land rights, inequality, and access to opportunities, in some countries dating back to colonial time. In Colombia, while the first half of the 20th century was a period of relative political peace, protests for unsatisfied social demand led to repression and episodes of mass killings. The repression of a banana workers' strike in 1928 marked social consciousness (Gabriel García Márquez depicted this massacre in *One Hundred Years of Solitude*) and deepened distrust of the state and the political establishment (Lopez Jerez and Barbosa Amaya 2021; Orlando Melo 2017). In Central America, large inequalities and social discontent, in the context of the Cold War and struggles against military dictatorships, provided fertile ground for the emergence of revolutionary groups and the spreading of civil war. More recently, the COVID-19 pandemic contributed to a 10 percent increase in protests and politically related violence (ACLED 2023), while in Venezuela protests rose in response to deteriorating economic conditions and concerns over democracy.

- *Civil wars*: Many countries in LAC have gone through periods of civil wars, most often because of political and economic polarization, a fight against military regimes or dictators (protecting vested interests), or the radicalization of extremist political groups. El Salvador's civil war (1979–92) was fueled by mounting discontent over unresolved social issues and led to thousands of deaths (Schultze-Kraft and Flemion 2024; Chávez 2015). After the civil war ended, the militarization of civil society, the return of displaced youth who had formed gangs in the United States, the weakness of the state in parts of the country, and the lack of economic opportunities left by the war contributed

Box 1. *(Continued)*

to the emergence of *pandillas*. Often originated as autonomous neighborhood self-defense groups, *pandillas* became criminal organizations specialized in extortion and territorial control (Jütersonke, Muggah, and Rodgers 2009; Hernandez and Aleman 2023). Guatemala's civil war (1960–96) caused the deaths of thousands, massive displacement of population—a majority of which were indigenous Maya—economic disruption, exacerbation of inequalities, and weakening of institutions (Horst and others 2024). In Colombia, the start of the guerrilla insurgence in the second half of the 1960s led to a resurgence of violence, not only between the guerrilla on one side and the armed forces and the paramilitary groups on the other, but also against civilians, mostly in rural areas (Pardo Rueda, 2004).

- *State violence*: In the 20th century, several LAC countries experienced dictatorships where imprisonment, torture, and enforced disappearances were common. In addition to the direct costs in terms of homicide and human right violations, dictatorships have been a concomitant cause of civil wars.

- *Political violence*: Since Latin American countries achieved independence, the contentions between different political factions have sometimes resulted in episodes of murders, crimes, and even civil war. In Colombia, the period called "The Violence" (between 1948 and, roughly, 1960) is a prominent example. Episodes of violence between the liberal and conservative parties had flared since the 19th century. The Violence started with the assassination of the liberal party leader in 1948 but was rooted in a context of discontent leading to unprecedented escalation of murders and brutality (Guzmán Campos 1986; Guzmán Campos, Fals Borda, and Umaña Luna 1986). On the one hand, the 1957 political agreement between the liberal and the conservative parties paved the way to end The Violence; on the other hand, the agreement radicalized groups that saw revolution and armed conflict, rather than politics, as the only viable mean to obtain social progress. This eventually led to the emerge of the guerrilla and subsequent conflict (Orlando Melo 2017, 2021).

3. The Geography of Crime: Latin America and the Caribbean's Pockets of Fragility

Studies on crime and violence often start from data at the national level, showing how different countries rank in terms of homicide rates. However, the reality is that violent crime is highly localized—about 50 percent of crime across LAC occurs in just 2.5 percent of the street space (Chainey and Monteiro 2019). This section presents data on within-country variations in homicide rates, analyzes the factors that may explain them, and estimates their local economic impact. This approach is valuable both to inform development interventions that aim to reduce insecurity in municipalities and regions and to highlight the relevance of policy coordination between the central and subnational governments, one of the main challenges in the implementation of effective citizen security policies (Chinchilla and Vorndran 2018).

A. High Within-Country Variations in Crime

Subnational data on homicides collected for 17 LAC countries show that the variance of per capita homicide rates is around 10 times higher between municipalities than between countries (Figure 4, panel 1). The large within-country variation is also evident on a map depicting homicide rates across the region (Figure 4, panel 2). The map illustrates the highly localized nature of crime: even countries with relatively high aggregate homicide rates—such as Brazil, Colombia, Ecuador, Guatemala, and Mexico—have areas of relative calm. Conversely, in countries where aggregate murder rates are relatively low, such as Peru, some areas still suffer from high levels of violent crime.

This granular perspective can help shed light on the evolution of violent crime across spatial and temporal dimensions. In Ecuador, the national homicide rate surged from 5.7 per 100,000 people in 2018 to about 45.1 in 2023, making it the most violent country in South America (Muggah and Aguirre, 2024). Since 2021, the country has introduced several separate states of emergency and deployed the military to tackle gang-related violence. Rising murder rates are attributed to intense clashes between rival transnational and local drug factions disputing lucrative drug trade routes, especially in the ports of Esmeraldas and Guayaquil (UNODC 2023b). Figure 5 confirms this observation, showing the rapid spread of gang-related murders to coastal areas.

B. Features of Frontline Municipalities

What do municipalities in LAC that are disproportionately hit by violent crime have in common? By combining the regional homicide data with relevant geographical information on economic and social development, it is possible to identify a set of cross-cutting features of areas that are most vulnerable to criminal violence. These include the following:

- *Geographic location and transportation infrastructure*: As shown in Figure 6, panel 1, municipalities that are located along a border or the coastline or that have main roads tend to see higher levels of lethal violence. This suggests that crime is associated with the transportation of illegal goods and conflict between organized crime groups surrounding the transportation infrastructure. This result is in line with a broader literature showing how geography affects crime routes. For example, Field, Clarke, and Harris (1991) and Hajdnijak (2002) show how crime along the US-Mexican border varies with distance from the border. That crime is more prevalent among country borders could also be influenced by migration and the spreading of organized crime across borders, as has been seen with Venezuela's Tren de Aragua gang

Figure 4. The Heterogeneity of Crime and Violence in Latin America and the Caribbean

National averages mask significant regional differences.

1. Variance in Homicide Rates
(Homicide rates per 100,000 people, 2022)
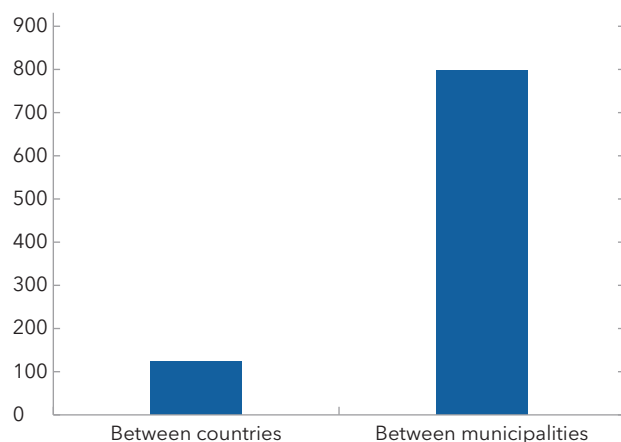
2. Lethal Violence in Municipalities
(Homicide rates per 100,000 people, most recent year available)

Legend:
- 0–10
- 10–20
- 20–40
- 40–80
- 80–160
- >160
- No data
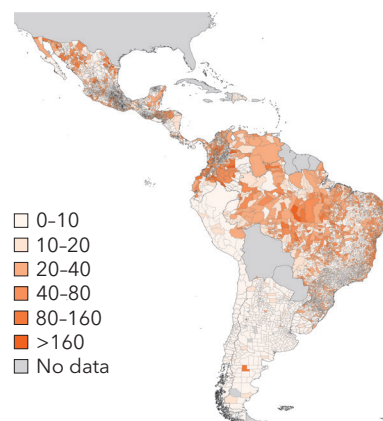
Sources: Administrative divisions: Runfola and others (2020) geoBoundaries: A global database of political administrative boundaries. PLoS ONE 15(4): e0231866. https://doi.org/10.1371/journal.pone.0231866; Argentina–population: Instituto Nacional de Estadística y Censos, homicides: Ministerio de Seguridad; Belize–population: Statistical Institute of Belize, murders: Belize Crime Observatory; Brazil–population: Instituto Brasileiro de Geografia e Estatística, homicides: Instituto de Pesquisa Econômica Aplicada; Chile–population: Instituto Nacional de Estadística, homicides: Centro de Estudios y Análisis del Delito; Colombia–population: Departamento Administrativo Nacional de Estadística, homicides: Departamento Administrativo Nacional de Estadística; Costa Rica–population: Instituto Nacional de Estadística y Censos, homicides: Organismo de Investigación Judicial; Dominican Republic–population: Oficina Nacional de Estadística, homicides: Centro de Análisis de Datos y Seguridad Ciudadana; Ecuador–population: Instituto Nacional de Estadística y Censos, homicides: Instituto Nacional de Estadística y Censos; El Salvador–population: Banco Central de Reserva, homicides: Policía Nacional Civil; Guatemala–population: Instituto Nacional de Estadística, homicides: Ministerio de Gobernación; Honduras–population: Instituto Nacional de Estadísticas, homicides: SubSecretaria de Seguridad; Mexico–population: Instituto Nacional de Estadística y Geografía, homicides: Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública; Nicaragua–homicide rate: Policía Nacional; Panama–population: Instituto Nacional de Estadística y Censo, homicides: Sistema Nacional Integrado de Estadística Criminal; Peru–homicide rate: Instituto Nacional de Estadística e Informática; Uruguay–homicide rate: Ministerio del Interior; Venezuela–violent deaths rate: Observatorio Venezolano de Violencia; homicide rates: IMF calculations based on official data.
Note: For Argentina, the high murder rate in the municipality in the midsouth reflects a single homicide in 2022 in a small municipality. The population base year is different by country.

expansion (Manjarrés and Cavalari 2024). Because migrants are vulnerable, they are also often victims: an analysis of data in Colombia following the re-opening of its border with Venezuela in 2016 found that the increase in crime observed close to border crossings was driven by murders and sexual assault against Venezuelans (Knight and Tribin 2023). These results point to the importance of using geospatial data systematically when national authorities allocate police resources or implement socioeconomic development projects aiming to reduce people's incentives to take part in criminal activities.

- Demographics and social development: As shown in Figure 6, panel 2, murder rates are higher in areas where (1) a larger share of the population has not completed primary school, (2) there is a higher share of youth,[3] and (3) a higher share of the population lives in urban areas. The intersection between youth and schooling is important, as engaging the youth in schooling activities reduces the ability of potential perpetrators to commit crime when in school and reduces the incentive to engage in illicit activities in the longer term due to increased employability in the formal sector (Lochner 2020). These results stress the importance of ensuring economic opportunities for youth, especially by improving access to education and the provision of public services in underserved areas.

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[3] Latin American youth (10 to 19 years of age) make up about 29 percent all murder victims in Latin America (Imbusch and others 2011).

Figure 5. The Surge in Homicides in Colombia and Ecuador

Spatial and temporal evolutions of lethal violence pre- and postpandemic.

1. Homicides in Colombia and Ecuador
   (2015–19 average)
   (Homicide rates per 100,000 people)
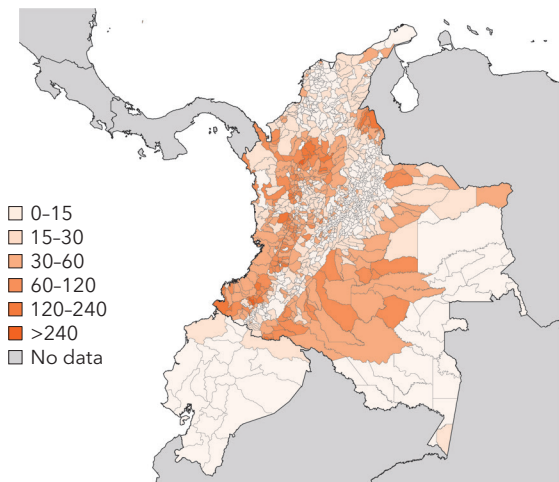
2. Homicides in Colombia and Ecuador (2022)
   (Homicide rates per 100,000 people)

□ 0–15
□ 15–30
□ 30–60
■ 60–120
■ 120–240
■ >240
■ No data
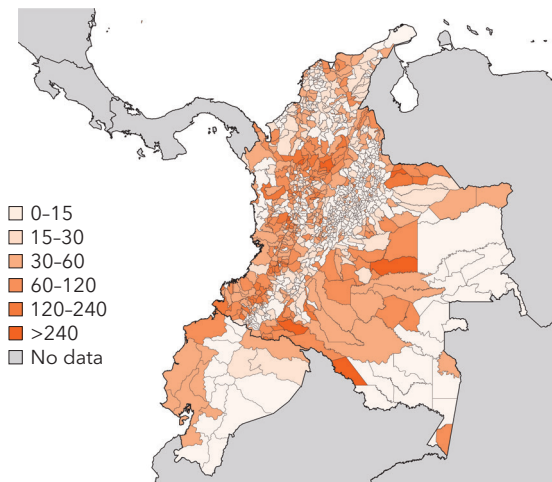
Sources: Administrative divisions: Runfolan and others (2020) geoBoundaries: A global database of political administrative boundaries. PLoS ONE 15(4): e0231866. https://doi.org/10.1371/journal.pone.0231866; Colombia–population: Departamento Administrativo Nacional de Estadística, homicides: Departamento Administrativo Nacional de Estadística; Ecuador–population: Instituto Nacional de Estadística y Censos, homicides: Instituto Nacional de Estadística y Censos; homicide rate: IMF calculations based on official data.
Note: Population base year is different by country.

Figure 6. Homicides and Municipal Characteristics in Latin America and the Caribbean

Murders are linked to structural and socioeconomic factors.

1. **Homicidal Violence, Geography, and Infrastructure**
   (Estimated effect on homicides per 100,000 inhabitants)
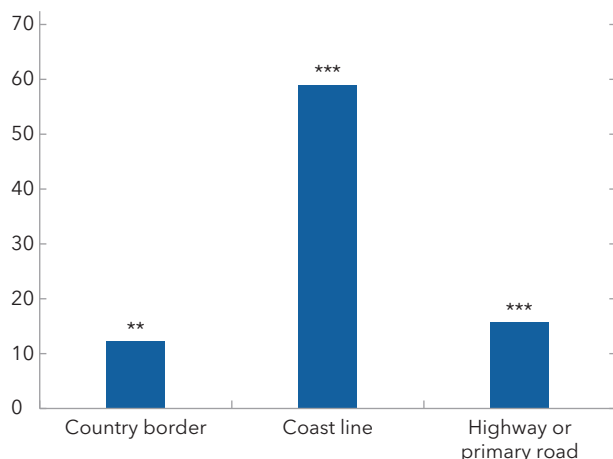
2. **Homicidal Violence, Demographics, and Social Developments**
   (Estimated effect on homicides per 100,000 inhabitants)
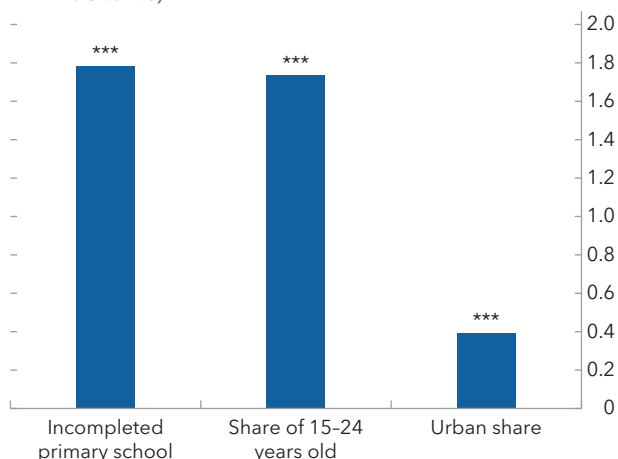
Sources: DANE; Global Roads Inventory Project, Global Roads Database; Global Biodiversity Model for Policy Support; and IMF staff estimations.
Note: Panel 1 shows selected coefficients from a regression on municipality level in Latin America with murders per capita on the left-hand side and existence of country borders, coastline, primary roads, or highways on the right-hand side. Panel 2 includes the share of population older than 15 years of age with incomplete primary school, the share of the population between 15 and 24 years old, and the share of the population in urban areas. The regressions also include country fixed effects. *p < 0.10; **p < 0.05; ***p < 0.01, computed using robust standard errors. Included countries are Argentina, Brazil, Chile, Colombia, Guatemala, Honduras, and Mexico during 2010-23.

C. Crime and Local Economic Activity

While previous papers have studied the impact of crime on the national economy—see, for example, IMF (2023a), Detotto and Otranto (2010), Pinotti (2015), and Verdugo Yepes, Pedroni, and Hu (2015)—the geographic concentration of crime makes it important to assess its effects at the local level.[4] These effects may be particularly intense, and evidence at the national level may overlook the consequences for local economies and the population: for instance, a surge in crime in a particular area may cause a relocation of economic activities toward safer provinces. However, the availability of reliable, high-frequency data is a challenge for analyzing the local impact of crime, especially using data across several countries. Official GDP data and other official measures of economic activity are usually not disseminated by municipality.

Leveraging nightlight data sets (Figure 7, panel 1), which have been shown to correlate well with GDP at the regional level, the analysis of subnational crime data shows that violent crime has sizable economic costs at the local level: a 10 percent increase in homicides at the municipality level decreases economic activity by around 4 percent (Figure 7, panel 2).[5] This association remains when instrumenting crime by the backlog in local courts, which strengthens the case for a causal relationship.[6]

Figure 7. How Crime Affects the Economy at the Local Level

Using nightlights as a proxy for economic activity to determine the impact of crime.

1. Nightlight as a Proxy for Regional Economic Activity
(2013–22)

2. Estimated Effect of 1 Percent Increase in Homicides on Economic Activity
(Percent)
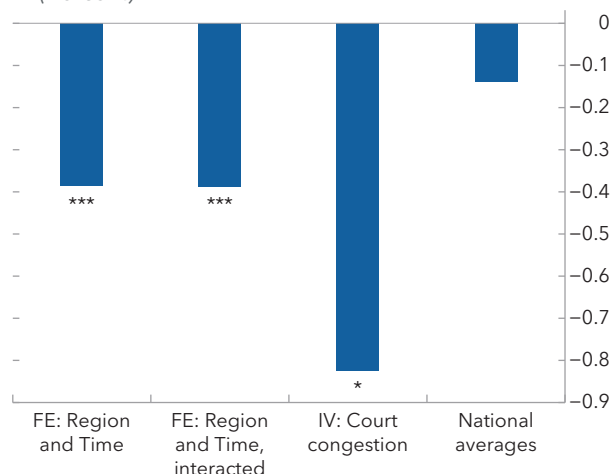
Sources: Hu and Yao (2022); and IMF staff estimations.
Note: Panel 1 shows nighttime lights as detected by satellites as a median during 2013–22. Panel 2 shows the estimated coefficients for a regression on the municipality level in Latin America with logged intensity of nightlight on the left-hand side and logged homicide rates (per 100,000 inhabitants) on the right-hand side. To convert nightlight intensity to economic activity (as shown) the elasticity of 1.3 from Hu and Yao (2022) is used. In the middle left bar, region and time fixed effects are also included, while in the middle bar interactions for regional and time-fixed effects are included. In the middle right bar, the murder rate is instrumented with the ratio of court congestion (pending and new cases/resolved cases) at the regional level. This instrumentation is done for Ecuador only. $*p < 0.10$; $**p < 0.05$; $***p < 0.01$, computed using robust standard errors. The estimates shown in panel 2 are based on monthly data covering Brazil, Colombia, Ecuador, Guatemala, Honduras, and Mexico. FE = fixed effects estimation; IV = instrumental variable estimation.

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[4] Papers studying how crime affect the local economy, for individual countries, include Cullen and Levitt (1999) for the United States and Melnikov, Schmidt-Padilla, and Sviatschi (2020) for El Salvador. This study adds to the analysis by compiling a comprehensive database covering local crime in several Latin American countries.

[5] The estimate uses Hu and Yao's (2022) measure of nightlight activity, which has an elasticity to regional GDP of 1.3.

[6] Further, Amaya and others (2024) establish a negative relationship between economic growth and crime at the local level using the stringency of local prosecutors as an instrument.

The results imply that halving homicide rates could improve economic activity, at the local level, by around 30 percent.[7] The magnitude is comparable to other estimates of the cost of crime, although methodologies and presentations vary. The UN Development Programme and US Agency for International Development (2022) estimate the cost of crime at around 10 percent of GDP in the more violent Central American countries. IMF (2023a) found that reducing the murder rate across Latin America to the world average (a 60 percent reduction) would raise annual growth by 0.5 percent, implying gains of 5 percent of GDP in 10 years and 10 percent of GDP in 20 years. The estimates presented here, at the local level, could also be higher than those obtained at the national level if crime in one area leads to relocation of economic activity to other areas. Indeed, estimating the same model on national-level data yields the result that a 10 percent reduction in crime lowers economic activity by around 1.5 percent–this would suggest that halving the homicide rate would lift economic activity by 10 percent. Our estimates at the local level are also consistent with other studies of how crime can hurt economic activity at the local level (Melnikov and others 2023).

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[7] The calculation is conservative, using the lower bound estimate from the log-linear models presented in Figure 7, panel 2.

4. Alternative Higher-Frequency Measure of Crime

Monitoring crime is often hampered by the lack of high-frequency data and significant discrepancies between indicators of crime, victimization, and perceptions of crime. This section proposes a novel, high-frequency, news-based measure of crime leveraging the text analysis of newspaper articles. It can complement existing data sets, thereby supporting real-time surveillance of crime and thus policymaking.

A. Challenges with Measuring Crime

Indicators of crime generally include the number of intentional homicides drawn from criminal justice and health records, the homicide rates compiled by statistical agencies, and data on violent offences such as kidnapping, serious assault, theft, or sexual violence. While these variables capture the actual levels of crime, metrics such as the victimization rate and the "crime as a top concern" indicator reflect perceptions of public safety.[8] Yet such indicators are only published at the annual or biannual frequency and with significant lags. Furthermore, official crime rates can be much lower than the victimization rate, especially if victims do not report crimes because they do not trust the police. The share of crimes not found in administrative police records—often referred to as the "dark figure of crime"—is estimated to be large, around 50 percent for advanced economies and even higher, at 90 percent, for LAC (Jaitman and Anauati 2020). Perception indicators based on surveys can also be a poor proxy for actual crime. For instance, Ardanaz, Corbacho, and Ruiz-Vega (2014) show that although public security improved and the crime rate diminished in Colombia during the 2000s, more people reported crime as being the most pressing problem of the country (Figure 8 presents a similar divergence).

Figure 8. Challenges in Measuring Crime

The discrepancy between actual and perceived levels of crime and violence is often high.

Crime Indicators in Colombia
(Homicides per 100,000 people, left scale; "crime as a top concern," percent of respondents, right scale)
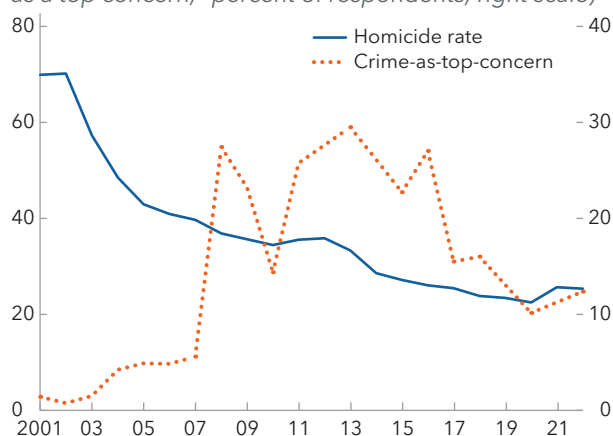
Source: Latinobarómetro; UN Office of Drugs and Crime; and IMF staff calculations.

B. A News-Based Crime Indicator

To overcome these limitations, a new indicator—the share of "crime news"—is constructed using the Factiva database of newspapers articles. For each country *c* and month *t*:

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[8] Two popular cross-country surveys are the AmericasBarometer (Latin American Public Opinion Project survey) and the Latinobarómetro, where interviewees are asked whether they have been a victim of crime (victimization) or whether they think public security, drug trafficking, and/or gang activities are the most important problem facing the country (crime-as-top-concern).

Figure 9. Share of Crime News and Correlation with Other Indicators

1. Share of Crime News
(Percent of total news)

2. Correlation of the News-based Crime Indicator with Homicides and Crime-at-Top-Concern Indicators
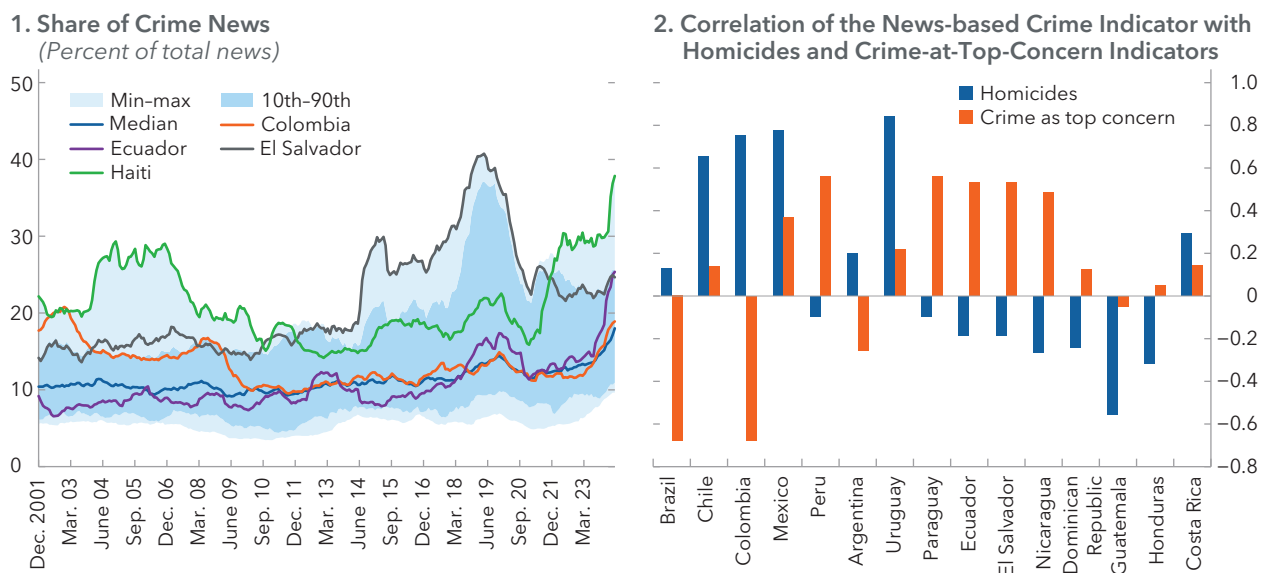
Sources: Factiva; and IMF staff calculations.
Note: The analysis relies on the set of countries with all three indicators available.

- The denominator is the total number of international news[9] in month t that either mentions country c's name or tags its country code.

- The numerator counts the number of articles about country c that additionally contains one of the following keywords: *crime*, *violence*, and *murder*, as well as variations of the keywords, such as "criminal" or "violent."

The newly constructed data set covers 20 countries in LAC and is available at monthly frequency starting from January 2001.[10] The measure follows a well-established literature on using text-based news analysis to measure economic uncertainty (Baker, Bloom, and Davis 2016; Ahir, Bloom, and Furceri 2022), social unrest (Barrett and others 2022), corruption (Hlatshwayo and others 2018), and conflict risks (Mueller and Rauh 2022).

The news-based measure (Figure 9, panel 1) appears to capture major crime episodes in the region, including important improvements in the early 2000s and the postpandemic deterioration in a few countries. For example, Colombia's marked reduction of crime rate between 2000–10 is well-captured by the news-based measure, as the share of crime-related news halved during that period. For Haiti, the share of crime-related news peaked between 2004 and 2007 and spiked again postpandemic, capturing the sharp rise in crimes associated with the 2004 coup d'état and the ongoing political instability due to gang violence. El Salvador's deterioration after 2012 and subsequent improvement, and similar developments in Honduras and Nicaragua, are also reflected in the crime news measure.

Systematically checking for correlations with other metrics of crime, it appears that the share of crime-related news aligns well with *actual homicides* in South America, but for countries in Central America, the index is correlated with the *perception of crime* as a top concern, rather than with actual crime (Figure 9,

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[9] The focus is on international newspapers, as done in similar research creating indicators from newspapers (for example, Barrett and others 2022), as these tend to have data available over longer spans and tend to be more objective.

[10] Countries covered in the sample are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, and Uruguay.

panel 2). A potential explanation for this difference is the relative importance of different types of crimes: the news-based measure, due to the choice of keywords, tends to focus on homicides while other crimes are more prevalent in some countries.

Looking at recent events, the indicator points to a decline in crime-related news during the pandemic—although during that period, gender-based violence increased (UN Women 2021), but this form of violent crime is underreported. The indicator seems to capture recent increases in Colombia, Ecuador, and Haiti. In fact, the postpandemic resurgence of crime-related news appears to be a regional phenomenon, seen through the upward shift of the entire distribution (Figure 9). In the case of El Salvador, the fall in homicide rates since 2022 does not lead to a fall in crime-related news, possibly because the crime policy itself has been newsworthy.

The news-based indicator has three main advantages: high frequency, scalability, and it is an additional metric of perceptions of insecurity.[11] The data are available at a monthly frequency, thereby enabling real-time surveillance, which is particularly useful in cases of rapid deterioration of public security and analyses requiring time series. The data can also be scaled up to include more countries and regions and extended to focus on specific issues by changing keywords, such as "organized crime" or "drug trafficking." Finally, this indicator could be useful when considering the impact of crime perception on key macroeconomic variables, such as the exchange rate, bond spreads, capital flows, or industrial production as shown in the following.

The news-based indicator also has drawbacks. First, a standard news measure cannot determine the direction of changes (positive versus negative developments), so human verification and judgment are still essential to avoid erroneous conclusions. Second, the news-based measure could spike when international newspapers pay more attention to crime in another country (for example, due to large immigrant arrivals) instead of when the crime itself surges. Finally, depending on data availability, news-based crime indicators could be constructed to include local news and other types of crimes, by expanding the set of keywords.

C. Crime News and Industrial Production

The news-based metric of crime can be used to assess the impact of crime on economic activity, among other possible uses. The analysis performs a local projection exercise (Jordà 2005) regressing contemporaneous and future industrial production on crime news and controlling for four quarters of lags of both the dependent and independent variables.[12,13] Both industrial production and crime news indices are seasonally adjusted to avoid potential seasonal patterns and converted to quarterly frequency for model estimations. Figure 10, panel 1, shows the main result: an increase in the share of news covering crime by 10 percentage points is associated with a peak decline of 2.5 percent in industrial production about three quarters after the shock, though the short-term impact appears to dissipate after five quarters. Since the share of news devoted to crime could be noisy and move for reasons unrelated to crime itself (for example, declines in crime reporting due to more coverage given to other issues, such as international relations), a model is also estimated, as a robustness check, to assess the impact of a "spike in crime news," defined as an episode when the share of crime news increases by more than 5 percentage points over a year. Figure 10, panel 2, shows the result of this estimation, an impulse response function of similar shape and magnitude.

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[11] Since the construction of the news-based measure currently relies on international news, this indicator might measure foreign perception of insecurity rather than domestic perception. Figure 10 shows that the correlation with domestic crime perception, measured in the "crime-as-top-concern" surveys, varies by country.

[12] The impact of crime on the full economy could be greater or smaller, as industrial production represents only a section of the formal sector of the economy.

[13] The sample includes Argentina, Brazil, Chile, Colombia, Ecuador, El Salvador, Mexico, Peru, and Uruguay. Data for some countries go back to 2001, though some others start later. We only use prepandemic data to avoid structural breaks due to the pandemic.

Figure 10. Crime News and Industrial Production
(Log points)

How high-frequency crime data can be leveraged to assess the effect of insecurity on economic activity.

Impulse Response of Industrial Production to Crime News

1. Response to a Standard Shock

2. Response to a "Spike in Crime News"
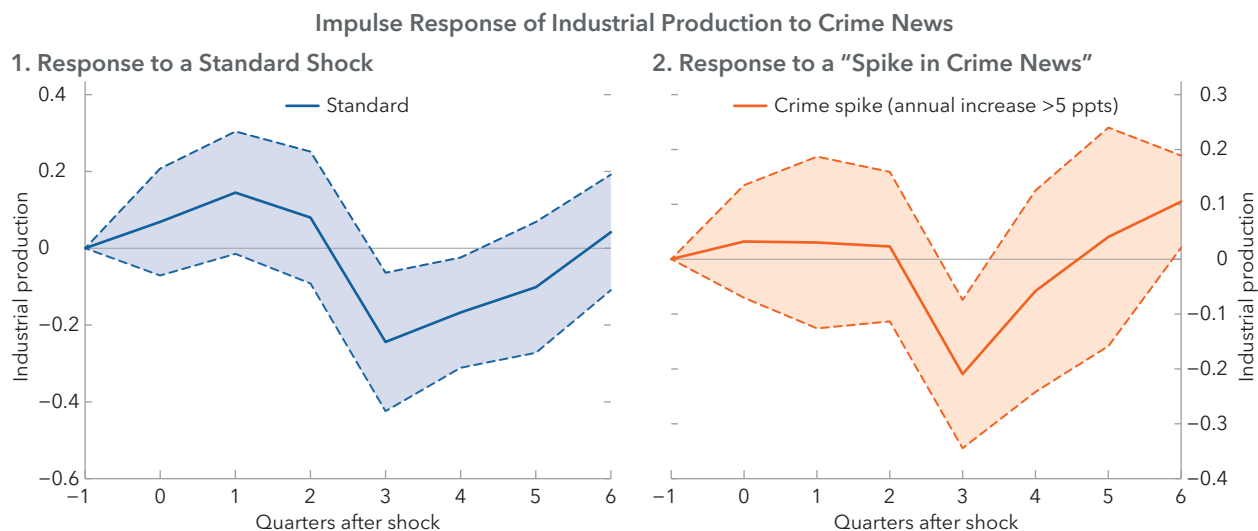
Sources: Factiva; Haver Analytics; and IMF staff calculations.
Note: This chart plots the impulse response function of industrial production (in log form) to a 1 percentage point increase of the crime news share measure using the local projection method (Jordà 2005) and 95 percent confidence band. A coefficient of −0.1 corresponds to a 0.1 percent decline in industrial production for an increase of crime news share by 1 percentage point. The blue line (panel 1) is the impulse response function to the share of crime news, while the orange line (panel 2) is the impulse response function to a "spike in crime news," a dummy variable indicating a 5 percent increase in crime news over the past 12 months. The analysis relies on the set of countries with industrial production data available on Haver Analytics with a sufficiently long time series: Argentina, Brazil, Chile, Colombia, Ecuador, El Salvador, Mexico, Peru, and Uruguay. Data for some countries go back to 2001, though some others start later. We only use prepandemic data to avoid structural breaks due to the pandemic, and the data series are deseasonalized.

The analysis thus shows that changes in insecurity can have effects on economic developments rapidly, an important result that justifies the value, for economic policymakers, of monitoring crime statistics and insecurity frequently. Incorporating the proposed news-based metric into the type of macro-econometric models central banks use may thus be useful to study the effect of insecurity on a variety of macroeconomic variables.

5. Revisiting the Economic, Institutional, and External Drivers of Crime

Crime and violence have persisted in LAC despite considerable socioeconomic progress. Since 2000, the region grew on average 2.5 percent annually—with many countries experiencing growth rates close to 4 percent—poverty rates have decreased, school attendance and health indicators improved, and many countries reported gains in terms of more inclusive growth (Jaitman 2019). Rapid social gains were achieved via the expansion of social programs and strong growth, including thanks to commodity price increases in commodity-exporting economies, though these gains have slowed since 2015 with the moderation in real commodity prices and the associated slowdown in growth. Despite these broadly positive trends, LAC has continued to display the highest levels of violent criminality in the world.

What economic factors, especially what macroeconomic circumstances, may explain this trend? To explore this question, a cross-country panel analysis uses data from 100 emerging market economies, spanning over three decades, leveraging the large variations observed across countries and over time in homicide rates and its potential determinants. This section also examines the nexus between lethal violence and the quality of a country's rule of law and the exposure of LAC countries to external factors, in particular the availability of firearms from the United States (see Annex 2).[14,15]

The importance of economic conditions as drivers of crime has been a subject of analysis in the academic literature at least since Becker's (1968) model of rational individuals comparing the costs and benefits of engaging in crime. Modern contributions include Kelly (2000), who demonstrates the strong impact of inequality on violent crime using data on US metropolitan counties, and Fougère, Kramarz, and Pouget (2009) and Grönqvist (2013), who identify a strong link between youth unemployment and crime using data for France and Sweden, respectively. The effect of downturns on crime is also documented in Bell, Bindler, and Machin (2018), who find, based on cohort-level data for the United Kingdom and the United States, that young people who leave school during recessions are significantly more likely to engage in criminal activities. J-PAL (2021) summarized various randomized evaluations, suggesting youth training programs and effective governance can reduce crime.

A. Internal Drivers: Macroeconomic Outcomes and the Quality of Governance

Cross-country regressions indicate that macroeconomic instability, higher inequality, and weaker governance are associated with an increase in homicides (Figure 11):

- *Growth*: In LAC, when growth is negative, homicides increase the year after by between 3 and 6 percent, depending on the specification. This effect is not observed in other regions of the world, pointing to regional disparities in how economic and social characteristics influence homicides.[16] Other studies, such

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[14] As measured by the World Bank's Worldwide Governance Indicators index, rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. See World Bank (n.d.).

[15] Drawing on data from the Annual Firearms Manufacturing and Exportation Report published by the US Bureau of Alcohol, Tobacco, Firearms, and Explosives. This includes firearms purchased by domestic law enforcement agencies and firearms manufactured for exports while excluding production for the US military.

[16] In the cross-country panel analysis, negative growth and inequality have a negative short-term impact on homicides in non-LAC countries (see Annex 2). Rosenfeld (2014) presents empirical analyses indicating that crime rates did not rise in the United States during the Great Recession of 2008–09, pointing to the complex empirical link between aggregate business cycle dynamics and crime rates. Nonlinearities in the relationship between inequality and homicide rates may explain why inequality has a significant association with homicide rates only in LAC countries, which typically exhibit high levels of inequality.

Figure 11. Internal and External Drivers of Crime
(Regression coefficients, in percent)

Homicides are affected by macroeconomic variables, the quality of institutions, and regional spillovers.

1. Responses of Homicide Rates to Negative Growth, Inflation, Inequality, and Governance
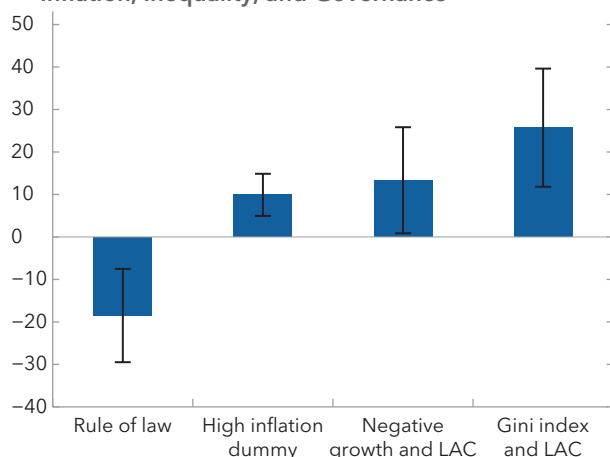
2. Response of Homicide Rates in LAC to the Production of Firearms in the United States

Δ log US firearms production and log closeness to the US
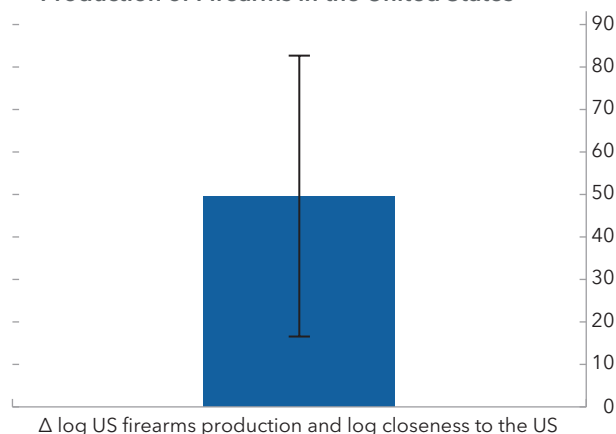
Sources: Centre d'Études Prospectives et d'Informations Internationales; US Bureau of Alcohol, Tobacco, Firearms and Explosives; World Bank, World Development Indicators; and IMF staff calculations.
Note: Solid lines indicate 90 percent confidence intervals. The dependent variable is the logarithm of homicides per 100,000 people. In panel 1, the analysis considers a panel of 81 emerging market economies extending from 1997 to 2021. Rule of law is a governance index from the World Bank, and high-inflation episodes are years with consumer price inflation above 10 percent (countries with inflation always above 10 percent drop from the model). "Negative growth and LAC" and "Gini index and LAC" are interaction terms that interact negative growth and Gini index with a regional dummy for LAC countries. The Gini index is standardized. Explanatory variables are lagged by a year. The regression includes the logarithms of GDP per capita, youth bulge (share of 15- to 24-year-old males), and total population as control variables as well as country and time fixed effects. In panel 2, the analysis considers a panel of 29 LAC economies extending from 1997 to 2019. The bar shows the coefficient of the interaction term between the percent change in US firearms production and the opposite of the logarithm of the distance between the most populated city of a country and New York City. The regression includes country fixed effects and the same control variables as in panel 1 except for the Gini index to increase the sample size. LAC = Latin America and the Caribbean.

as Stuckler and others (2009), have found that a 1 percentage point increase in the unemployment rate is associated with a 0.8 percentage point increase in homicides. This is broadly consistent with the findings presented here under the assumption that the unemployment rate increases by several percentage points during economic downturns. Other studies that investigated labor market conditions at the local level found that a weaker labor market is associated with higher homicide rates—see Dell, Feigenberg, and Teshima (2019). There is also evidence that high levels of informality are linked to higher homicide rates, highlighting the role of economic opportunities in driving criminal activities (Herrera Giraldo, González Espitia, and Ochoa Diaz 2023).

- *Inequality*: Similarly, increases in the Gini index by one standard deviation—a rise of about 9 percentage points—are associated in the following year with a 9 to 12 percent increase in homicides in LAC, but not in other regions. In a specification using homicides per capita, a 10 percentage point increase in the Gini coefficient is associated with 5.9 additional homicides per 100,000 population in LAC countries (see Annex 2, Annex Table 2.1, column D). This result is consistent with Schargrodsky and Freira (2021), who found that a 10 percentage point increase in the Gini coefficient is associated with 4.1 additional homicides per 100,000 population.

- *Inflation*: Episodes of high inflation—years with consumer price inflation above 10 percent—are associated with a 10 percent increase in homicides in the subsequent year, on average.[17]

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[17] The cutoff value for defining high inflation episodes was chosen at 10 percent because there is evidence that for emerging markets, inflation above 10 percent starts being detrimental, for instance, for economic growth—see Khan and Senhadji (2001) and Espinoza, Leon, and Prasad (2012).

- *Rule of law*: The state's ability to provide rule of law effectively is significantly linked to homicides: a one standard deviation improvement in the rule of law index is associated with an 18 percent decline in homicides.

B. External Spillovers

External factors may also affect crime developments in a country. In particular, illicit firearm trafficking (proxied by US firearm production) and drug trafficking have been connected to homicides (UNODC 2020). In the Caribbean, almost all firearms and ammunition are imported, whether legally or illegally. From 2017 to 2022, firearms were used in two-thirds of all homicides in the Caribbean region, much higher than the global average of 40 percent (UNODC 2024a). Dell (2015) also provides robust empirical evidence on how organized crime linked to international drug trade fuels violence in Mexico, while Sviatschi (2022) shows how US deportation policies can disseminate criminal networks and spread gangs across borders.

This analysis shows the link between homicides in LAC countries and the availability of firearms in the United States, with the impact being noticeably stronger in countries closer to the US border. Specifically, a 10 percent increase in US firearms production is associated with a 5 percent increase in homicides for countries that are twice closer to the United States. This is consistent with the results of Dube and others (2013), who found that the expiration of the US Federal Assault Weapons Ban in 2004, lifting the prohibition on domestic sales of military-style firearms, led to a sharp increase of homicides in Mexico.

This analysis thus underscores the role of macroeconomic stability, comprehensive safety nets, and robust institutions in effectively addressing crime. It is in line with the existing literature, such as Schargrodsky and Freira (2021), who find a robust association between inequality and crime across a range of econometric specifications, and Rivera (2016), who emphasizes the strength of the judicial system capacity as a bulwark against crime. In the models presented here, the time-varying and country-specific explanatory variables chosen appear to explain about 20 percent of the variance in the data (within-R-squared values of about 0.2). These results highlight the complexity of crime as a social phenomenon and underscore the need for a multifaceted approach in addressing its driving forces.

It is important, however, to acknowledge that the analysis does not cover the entire spectrum of factors influencing crime rates, some of which are absorbed by the country fixed effects (which may capture history and institutions; see Box 1) and the time fixed effects (which may capture global factors such as the effect of global crises, pandemics, or drug prices). Due to data constraints, the analysis also cannot account for some potentially significant factors influencing violent crime, such as drug prices and levels of drug abuse, as well as the presence of organized crime. The scope of the analysis does not extend either to risk factors linked to crime, including individual traits, family structure, and community organization (Chioda 2017). Finally, it is always difficult, in large cross-country panels, to fully address endogeneity concerns. The various fixed effects, time effects, and lagging of the explanatory variables give some comfort that the relationship estimated is causal. However, this is not certain given the complex relationships between socioeconomic factors, insecurity, and growth that could lead to biased estimates due to confounding factors. Thus, the findings should be primarily interpreted as associational—and useful for prediction given the lagging of explanatory variables in the models presented—rather than causal. Additional analyses are conducted to strengthen the causal interpretation of the results, such as using a victimization survey (thus using individual-level data, where reverse causality is very unlikely) or explaining the cross-country variation in average homicide rates on the initial values of the determinants of violent crime (Annex 2).

6. The Impact of Insecurity on Firms

The effects of insecurity on the economy, and in particular on long-term growth, are shaped by its impact on the private sector, and in particular on firms' performance and investments. This section sheds light on the extent to which firms perceive crime as an obstacle for doing business and the specific ways in which crime and insecurity drive up private sector costs, using recent World Bank Enterprise Surveys[18] for Latin America[19] as well as the Innovation, Firm Performance and Gender Survey for Caribbean countries.[20] These two data sources are similar firm-level surveys, covering the formal sector and featuring harmonized data across countries and indicators related to crime.[21] An analysis of a separate firm-level data set for Mexico (which also covers informal firms) helps understand the impacts of organized crime more specifically.

A. How Crime and Violence Stifle the Private Sector in LAC

Nearly one-third of the firms surveyed in LAC see crime as a threat to doing business. On average, 31 percent of firms perceive crime as a major or very severe obstacle (Figure 12). Some Caribbean countries, including Jamaica and Belize, show high levels of concern, with more than 50 percent of firms declaring that "theft, robbery, vandalism, or arson" is a major or very severe impediment. Other Central American and Caribbean countries—such as Antigua and Barbuda and Guatemala—also exhibited relatively high rates of concern.

Figure 12. Crime as a Barrier to Doing Business
(Percent of firms declaring that "theft, robbery, vandalism, or arson" is a major or very severe impediment)
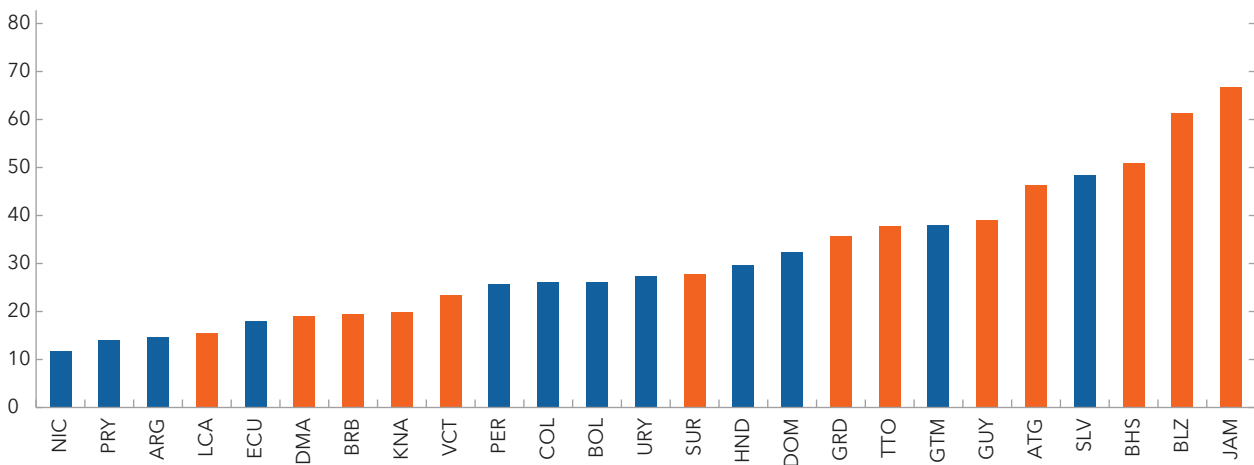
Sources: 2020–21 Innovation, Firm Performance and Gender Survey; World Bank, 2016–18 Enterprise Surveys; and IMF staff calculations.
Note: Data are from World Bank Enterprise Surveys (blue bars) and Innovation, Firm Performance and Gender Survey (orange bars). Data labels in the figure use International Organization for Standardization (ISO) country codes.

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[18] The World Bank's Enterprise Surveys cover over 6,500 firms from a wider sample of countries between 2016 and 2018. See https://www.enterprisesurveys.org/en/enterprisesurveys.

[19] Latin American countries included are Argentina, Bolivia, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, Peru, and Uruguay. Caribbean countries included are Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

[20] This survey covers 2,000 firms between 2020 and 2021. See https://www.competecaribbean.org/docs/ifpg-survey/index.html.

[21] The surveys focus on representative firm samples from the manufacturing and services sectors, target formal (registered) companies with five or more employees, and cover mostly cities/regions of major economic activity.

In contrast, the lowest values are found in Nicaragua and Paraguay (below 15 percent). Furthermore, on average at the regional level, firms perceive insecurity as a major or very severe obstacle more often than other commonly cited barriers such as "access to finance" and "licenses and permits."

For both Latin America and the Caribbean, the firm surveys indicate that the direct costs of crime amount to roughly 7 percent of firms' sales (Figure 13). These costs comprise two categories: (1) losses due to crime ("theft, robbery, vandalism, or arson") and (2) the amount spent on security ("equipment, personnel, or professional security services") as a percent of annual sales. The analysis shows that firms in Latin America spend somewhat less on security and incur slightly higher losses due to crime than firms in the Caribbean (Figure 13, panel 1).[22] These results are in line with other studies, in particular from the IDB (Jaitman 2017; Perez-Vincent and others 2024). In other regions, studies have shown that the direct costs of crime are typically lower, with costs around 3 percent of annual sales in selected upper middle-income countries and high-income countries (World Bank 2023). Furthermore, Amin (2009) finds that the direct costs of crime for Latin American firms are higher than their losses due to other factors, such as bribes or power outages.

The analysis further shows that firm size matters: small firms face relatively higher losses due to crime and spend relatively more on security (Figure 13, panel 2). This pattern—which Amin (2009) calls the regressive impact of crime—is clearer in Latin America, where direct costs of crime as a percentage of annual sales are almost twice as high for small firms (7.8 percent) than for large firms (4.1 percent). This difference is mainly accounted for by markedly higher losses due to crime experienced by small firms relative to large firms, whereas the difference in security spending is relatively minor. By contrast, in the Caribbean, the burden of security spending is especially heavier for small firms. Small firms lack economies of scale and thus spend disproportionate amounts on safety, with limited effectiveness as losses from crime nonetheless end up relatively higher than at larger firms. Overall, the regressive impact of crime, together with existing evidence

Figure 13. Crime and Private Sector Development in Latin America and the Caribbean
(Percent of firms' sales)

Crime undermines firms' abilities to operate, with impacts being most significant for small enterprises.
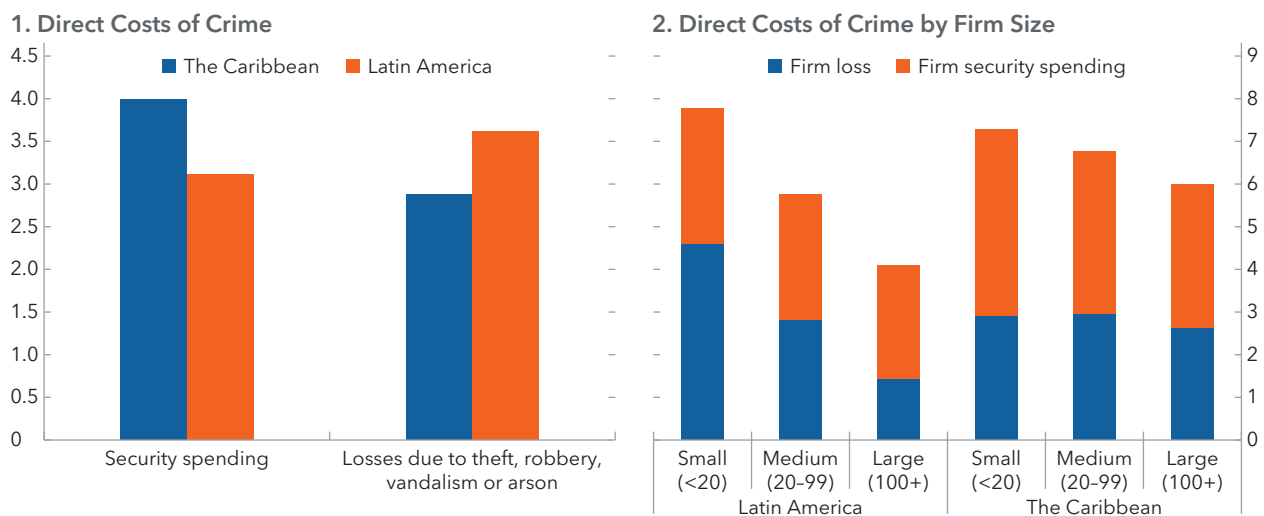
1. Direct Costs of Crime

2. Direct Costs of Crime by Firm Size

Sources: 2020–21 Innovation, Firm Performance and Gender Survey; World Bank, 2016–18 Enterprise Surveys; and IMF staff calculations.
Note: Security spending is defined as expenses paid for security such as equipment, personnel, and professional security services. Losses due to theft, robbery, vandalism, or arson refer to incidents that occurred on the establishment's premises. For panel 2, firm size is defined by the number of employees (small: less than 20; medium: between 20 and 99; large: 100 or more).

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[22] The surveys also reveal that, in a given year, about 20 percent of firms in the region are victims of crime. Also, in Latin America, nearly 70 percent of firms pay for security.

of a negative link between crime and microenterprise growth (BenYishay and Pearlman 2014), could be one factor to help explain why firms in the region tend to be small compared to what is observed in the rest of the world (Herrera and Lora 2005). This matters because smaller firms also tend to be less productive (OECD 2014). Relatedly, the regressive impact of crime might also push small firms toward the informal sector.

In addition, crime may lower firm labor productivity even when controlling for firm size. Crime can induce misallocation (Misch and Saborowski 2020), affect firm entry (Barbieri and Rizzo 2023), distort the allocation of managers (Bloom and others 2022), reduce low-skilled labor supply (Utar 2022), lower female labor force participation (Fernández, Ibáñez, and Peña 2014; Ouedraogo and Stenzel 2021), distort market prices and induce firm exit (Rozo 2018), and depress economic diversity (Ríos 2017).

To quantify this effect, regressions are estimated to assess whether firm-level labor productivity (sales per employee, in log) is related to the measure of insecurity (firm's perception, which enters as a binary variable that takes the value of 1 if the firm reports crime as a major or very severe obstacle to do business, and 0 otherwise), for the two data sets separately. The regressions include firm-level controls as well as country and sector fixed effects.[23]

The estimated coefficients imply that, in the firms surveyed that report crime as a major concern, labor productivity is 9 percent lower, though the variance is wide across firms (Figure 14, panel 1).[24,25] Using the Innovation, Firm Performance and Gender Survey question on firms' plans to innovate, the analysis shows that, for the Caribbean countries, a 10 percentage point increase in firms' security spending is associated with a 6 percent lower probability to innovate (Figure 14, panel 2).

B. The Economic Costs of Organized Crime: The Case of Mexico

Organized crime is likely to exacerbate the costs for firms, as its presence weakens the rule of law and organized groups may be able to extract larger rents from the private sector.[26] In Mexico, criminal networks are deeply involved in extortion (Peña Gonzales, 2021), with large rents from drug trafficking, including exports to the United States, contributing to gangs' ability to challenge the rule of law (Felbab-Brown 2020; Murphy and Rossi 2020). In fact, drug activities continue to adapt to evolving demand, reflected more recently in a substantial rise of Fentanyl exports.[27] This section leverages the granular data available in Mexico to study the impact of organized crime on firms.

The geographic spread of organized crime is hard to quantify at the local level, but surveys can provide insights on its presence. It is associated with specific offenses, such as homicides, extortions, and kidnapping. Victimization survey questions on the presence of gangs or on activities in the area that often involve criminal organizations (such as narcotics trade or prostitution) can also indicate the extent of organized

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[23] Although asserting causality is not possible in the setting used here, the inclusion of firm-level controls helps to mitigate potential endogeneity biases. The controls include firm size, firm age, and dummy variables to reflect if the firm is foreign-owned or if the firm invests in research and development. The sector fixed effects distinguish manufacturing and services.

[24] Using the Enterprise Surveys data, previous literature has also found a negative relationship between crime-related variables and firm performance (for example, sales). See Moyo (2012) (South Africa), Oguzoglu and Ranasinghe (2017) (South American countries), and Botrić (2021) (Central, Eastern and Southeastern European countries).

[25] Additional regression exercises estimated country-specific coefficients for the crime perception variable. The results point to some heterogeneity, with a stronger negative association between crime perception and firm labor productivity in Central American countries like Guatemala and Honduras. That analysis also showed some outlier results for countries such as Bolivia and El Salvador, which were therefore excluded from the cross-country regression underlying the results depicted in Figure 14, panel 1. The outlier results for El Salvador likely reflect ad hoc characteristics of crime in that country, where street gangs play a key role (see, for example, Lariau, Plotnikov, and Wong 2019). In the case of Bolivia, its relatively small sample of firms may induce unwarranted biases.

[26] While this section focuses on direct economic costs, homicides are a major human cost of pervasive presence of organized crime. See in particular Dell (2015) for a discussion on how homicides increased as a result of the Mexican drug war in the 2000s.

[27] See Grandmaison, Morris, and Smith (2019) on the decline of heroin production in Mexico, and Pergolizzi and others (2021) on the prominent role of Mexico as a provider of Fentanyl in the United States. Calderón and others (2021) show also how the composition of seizures has shifted accordingly.

Figure 14. Longer-Term Effects of Crime on the Private Sector

The perception of crime is associated with lower labor productivity and diminished innovation.

1. Perception of Crime and Labor Productivity
(Estimated coefficients of crime perception dummy variable in regressions for log of labor productivity)
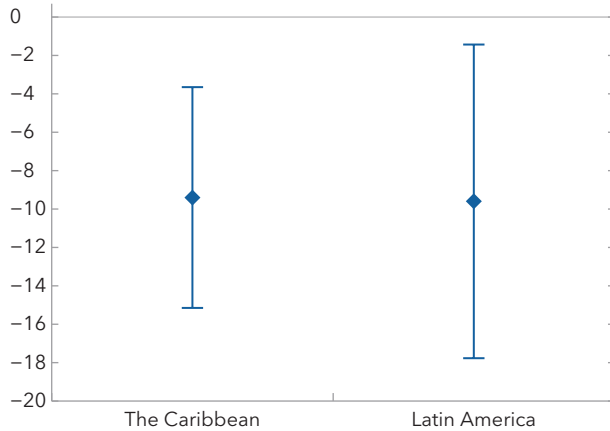
2. Security Spending and Innovation
(Change in predicted probability of innovation plans following an increase in security spending)
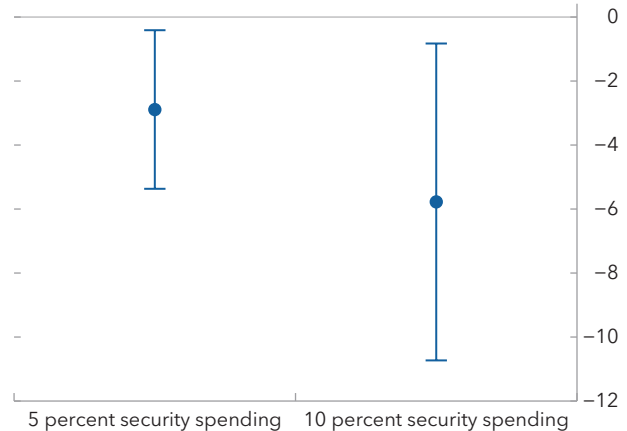
Sources: 2020–21 Innovation, Firm Performance and Gender Survey; World Bank, 2016–18 Enterprise Surveys; and IMF staff calculations.
Note: In panel 1, estimated coefficients are multiplied by 100, and their 90 percent confidence intervals, from cross-country regressions of (log) firm labor productivity on a "crime perception" dummy variable. In panel 2, results are based on a probit regression for Caribbean, where the dependent variable is a binary (yes/no) variable reflecting a firm's plans to implement product innovations within two years. The regression includes security spending (as percent of sales), firm-level controls, and country and sector fixed effects.

crime. Geocoded information from government documents, news, and social media can be used to build maps of organized crime activities.[28] While this type of analysis typically finds organized crime active presence spreads throughout the country, firm-level victimization surveys indicate that criminal groups are not active in all local areas—in fact, in most places, a majority of firms do not report the presence of gangs in their own neighborhood.

Figure 15 shows the proportion of firms that report local presence of gangs, indicating areas where the economic costs of organized crime may be the largest. The finding of strong organized crime presence near Mexico City contrasts with traditional maps (such as Figure 4, panel 2; see also Sobrino 2020; Velásquez 2020) that tend to indicate more concentration in states bordering the United States, but these other maps are centered on drug trafficking or homicides. Forms of organized crime focused on firms' extortion

Figure 15. Local Presence of Gangs in Mexico as Reported by Firms, 2022
(Share of respondents)
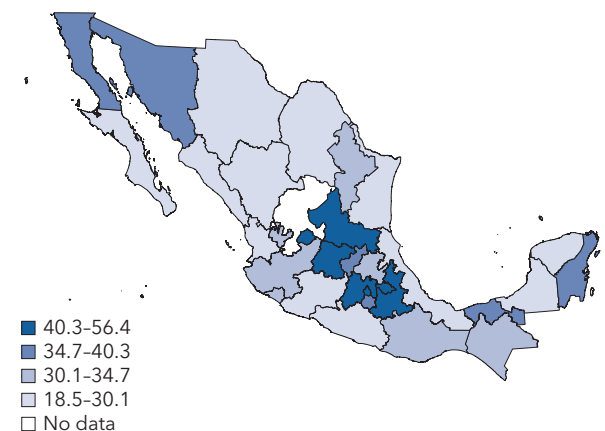
- ■ 40.3–56.4
- ■ 34.7–40.3
- ■ 30.1–34.7
- □ 18.5–30.1
- □ No data

Source: National Institute of Statistics and Geography (National Survey of Business Victimization, 2022 wave).
Note: Firm survey answers to a binary question about whether firms are aware or have heard of the presence of criminal or violent gangs in their neighborhood.

may have a different distribution across Mexico than forms of organized crime focusing on strategic places, such as transit corridors.

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[28] See, for instance, Study of Terrorism and Responses to Terrorism (n.d.); Sobrino (2020) scraps news to build municipality-cartel pairs.

Figure 16. Firms' Losses from Crime in Mexico
(Elasticities from a log regression of losses of crime)
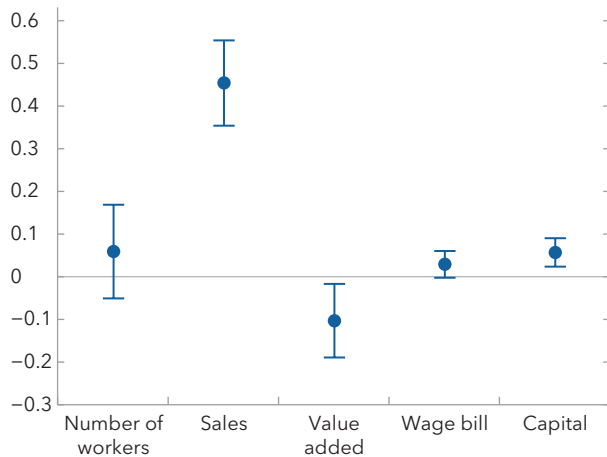
Source: National Institute of Statistics and Geography (National Survey of Business Victimization and Economic Census, 2014 wave); and IMF staff calculations.
Note: Coefficients and 95 percent confidence interval, estimated using a cross-section firm-level regression of the reported amount of losses due to crime from a victimization survey (in log), controlling for municipal and industry level fixed effects. Sales, value added, wage bill, and capital are expressed in nominal terms.

Expanding on the analysis in the previous section, firm-level data from Mexico's enterprise survey (National Survey of Business Victimization) covering formal and informal firms shows that organized crime[29] tends to target larger firms, as measured by sales.[30] The analysis, which considers various metrics of firm size (sales, number of employees, value added, wage bill, capital), finds a stronger relation between firm sales and losses due to crime, suggesting the cost of crime resembles a sales tax, rather than a tax on capital or a tax on wages (Figure 16). This likely reflects the fact that sales are the most visible indicator, triggering the attention of organized crime groups.[31] The analysis nevertheless confirms that the costs of crime are disproportionately larger, when expressed in percent of sales, for the smaller firms (Figure 17). The data also show that the cost of crime is often concentrated—for a given size, some firms pay four or five times more than the average firm—indicating that other factors are at play (that is, differences in security spending, political connections, etc.).[32]

Finally, the analysis shows that organized crime is particularly harmful. Both security spending and losses from the damage due to crime are larger for firms reporting the presence of gangs in the neighborhood (Figure 18, panel 1). Differences in losses from damage are especially stark (four times higher for firms that report that gangs operate in their vicinity) with smaller differences in security spending suggesting that there are limits to a firm's ability to protect itself from organized crime. Overall, these results complement the existing literature on the cost of organized crime, such as Melnikov and others (2023), who find that the presence of criminal gangs reduces economic activity, income, and education by hindering population mobility.[33]

Impunity is likely facilitating the operations of criminal groups, as only about one in five cases are filed with the police in Mexico. In about two-thirds of the nonfiled cases, the reason for not filing reflects lack of trust, with filing rates being even lower among respondents who believe the police is corrupt (Figure 18, panel 2).[34] A positive correlation between crime and underreporting also appears in victimization surveys, illustrating a potentially vicious circle in which crime can undermine trust and reporting rates, which in turn can lead to

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[29] This paragraph focuses broadly on the economic costs of crime, without disentangling between crime activities explicitly related to organized crime and other crime activities. However, a large share of homicides can be directly attributed to organized crime, from one-third to two-thirds according to Calderón and others (2021). In addition, other crime activities may be also related to gang weakening the rule of law and thus facilitating isolated criminal activities (see also Box 1 on the connected layers of violence).

[30] The elasticity is positive, which means that losses from crime typically increase with the level of sales, but not as fast as sales so that the loss-to-sales ratio declines with sales.

[31] By contrast, a firm's value added does not appear to be associated with losses from crime, suggesting that crime may affect more intensely value chains with more intermediaries, which display larger (gross) sales for a given level of final output. This could be because each intermediate transaction increases vulnerability.

[32] A similar metric of heterogeneity of burdens is reported for social security contributions, which also exhibit a considerable heterogeneity given the higher share of informality.

[33] Kalsi (2018) also finds that gang exposure reduces children's access to basic education.

[34] Reasons for not filing cases include the belief that filing is a waste of time, cumbersome procedures, fears of extortion by the police, and an explicit mention of lack of trust or hostile behavior of the authorities.

Figure 17. How Crime Affects Firms in Mexico

Losses from crime are significant, especially for smaller firms.

1. Crime Disproportionately Hits Small Firms
(Cost of crime as percent of sales, by firm size; x-axis is centiles of sales)
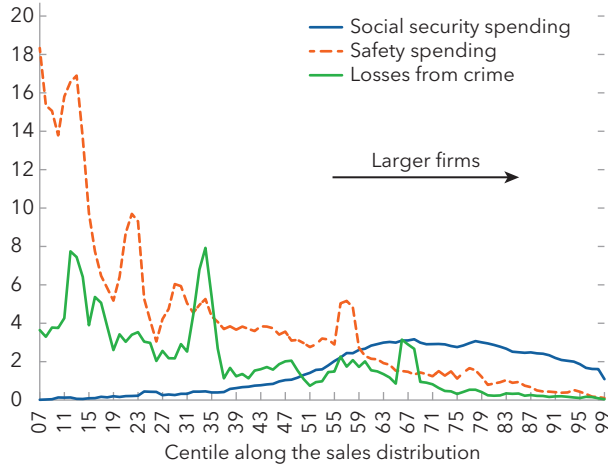
2. Some Firms Face Costs Four or Five Times Higher than the Average
(95th percentile cost/average cost; ratio computed for each centile of sales shown in the x-axis)
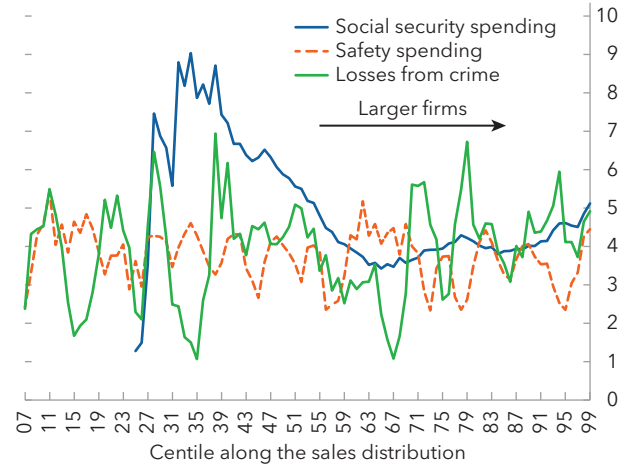
Sources: National Institute of Statistics and Geography (National Survey of Business Victimization and Economic Census, 2014 wave); and IMF staff calculations.

Note: Firms are gathered in buckets along the distribution of their sale, which each dot reporting an average over three centiles. For instance, at the 10th centile in panel 1, the red line reports the total amount of safety spending for firms in the 9th and 11th centile divided by the total sales of these firms; at the 10th centile in panel 2, the red line reports the average of the 95th centile of safety spending for firms for each of the 9th, 10th, and 11th centiles divided by the average of safety spending for firms in the 9th and 11th centile. Social security spending is provided as an indicative benchmark.

Figure 18. How Organized Crime and Corruption Affects Firms and Households in Mexico

Organized crime is costly to firms, and crime may be underreported as trust in the police and judiciary is low.

1. Costs of Crime and Gangs
(Percent of sales of each firm)
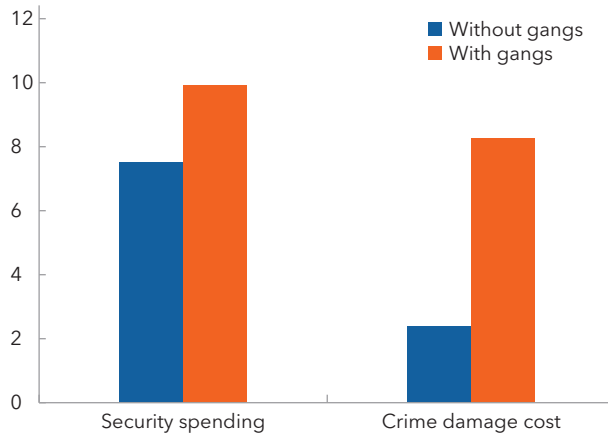
2. Cases Filed by Households
(Percent of cases reported in victimization survey)
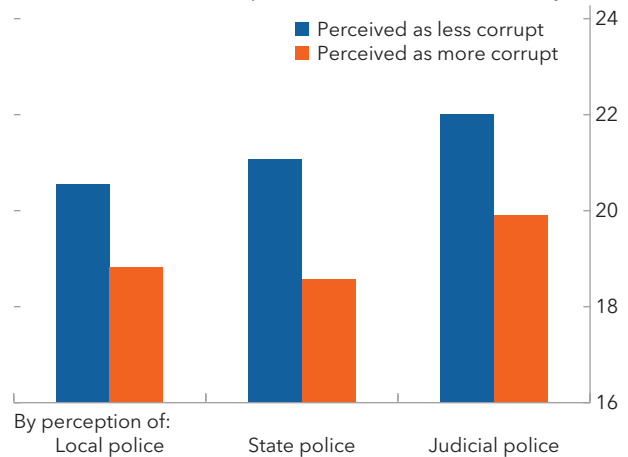
Source: National Institute of Statistics and Geography (2014 wave of National Survey of Business Victimization and 2018 wave of ENVIPE).

Note: Panel 1 reports unweighted average of costs to sale ratios (in percent) computed as the firm level. The firm sample is split along a binary question to each firm about whether they are aware or have heard of the presence of criminal or violent gangs in their neighborhood. Panel 2 reports shares of cases reported to the prosecution agency (Ministerio Público) or any other authority. Corruption perception is measured with a binary (yes/no) question.

more impunity and crime (see Corbacho, Philipp, and Ruiz-Vega 2015 for evidence that crime undermines trust). These results mirror a general distrust for police institutions in LAC, where police corruption is widespread: only 33 percent of people in the region trust the police, and the police is the public institution most vulnerable to corruption, with 24 percent of respondents reporting they paid a bribe to the police in the last 12 months (Transparency International 2019). Trust in the judiciary is also low (Croci 2023). The capacity of organized crime to weaken and infiltrate the security and judiciary apparatus reinforces these dynamics (Rose-Ackerman and Palifka 2018).

7. Fiscal Implications of Security Spending

The criminal justice system is in the front line of the policy response to violent crime and insecurity. Especially in periods of rising criminality, governments may adopt measures aiming to suppress, deter, or incapacitate offenders that can be accompanied by expansions in police or even military spending. In LAC, governments spend a substantial part of their resources to supporting public order and safety (POS; Jaitman 2017). Such efforts raise important issues for economic policymaking related to the value for money of each dollar spent (Pessino, Izquierdo, and Vuletin 2018), transparency of budget allocations, and, in some cases, the impact on fiscal space (Harborne, Dorotinsky, and Bisca 2017).

This section delves specifically into the fiscal implications of security spending. Using IMF and OECD data on POS[35] expenditures and UN Office on Drugs and Crime data on homicides and criminal justice personnel, the analysis compares spending trends in LAC with that of other regions and examines the relationship between dynamics of violent crime, security spending, and police force expansion—bearing in mind that crime rates are influenced by a multiplicity of factors that go much beyond the focus of this analysis (Chioda 2017).

A. Security Spending Patterns

Average spending on POS in the region as a share of GDP (1.9 percent of GDP) is slightly higher than in advanced economies (1.7 percent of GDP) and lower than in low-income and emerging markets (2.4 percent of GDP, see Figure 19, panel 1).[36,37] This reflects to a substantial extent the smaller size of government in LAC, as POS spending represents a higher share of total government expenditures (Figure 19, panel 2).

Specifically, average LAC spending on POS reaches 7.4 percent of total spending, against 6.6 percent in other low-income and emerging market economies and 5.3 percent in advanced economies. These numbers mask substantial heterogeneity: while several countries spend less than 5 percent of their government expenditure on POS, some Central American and Caribbean countries spend more than 9 percent of the budget on POS. This spending also increased in LAC more than in other regions since 2012, with some countries seeing jumps between 0.5 and 1 percent of GDP (El Salvador, Nicaragua, Trinidad and Tobago).

These data, however, may underestimate the fiscal burden of providing security, because reporting does not include military spending, even though the army is sometimes involved in internal security operations. This model, also known as "constabularization," emerged in part due to the growing sophistication of organized crime. Governments faced with this threat (for example, Ecuador, El Salvador, or Honduras) often apply military means to roles that are traditionally assigned to civilian law enforcement agencies, such as patrolling sensitive areas and maintaining law and order. Colombia and Mexico also have a long history of deploying the military in drug eradication missions (Flores Macias and Zarkin 2019). As such, accounting for changes

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[35] The data is taken from the IMF's Government Finance Statistics database and the Organisation for Economic Co-operation and Development. Within the POS category, the analysis includes only spending on the criminal justice system—police services, prisons, and courts—and other spending on POS not else identified.

[36] 2022 is the most recent observation in the Government Finance Statistics dataset. For those countries for which 2022 number is not available, the most recent year after 2018 is used.

[37] To correct for potential differences in prices, it is also worth comparing spending in purchasing power parity (PPP) terms. Indeed, for poorer countries, imports of security-related goods are more expensive because their real exchange rates tend to be more depreciated. At US$374 per capita, the average annual spending for the LAC region is only slightly above the average for all other low-income and emerging market economies (US$333 per capita).

Figure 19. Spending on Public Order and Safety in Latin America and the Caribbean

Security expenditures in LAC are marginally above those of advanced economies, but absorb a higher share of spending.

1. Spending on POS, LAC versus Other Economies, 2022
(Percent of GDP)

2. The Fiscal Burden of Spending on POS, 2022
(Percent of total government expenditure)
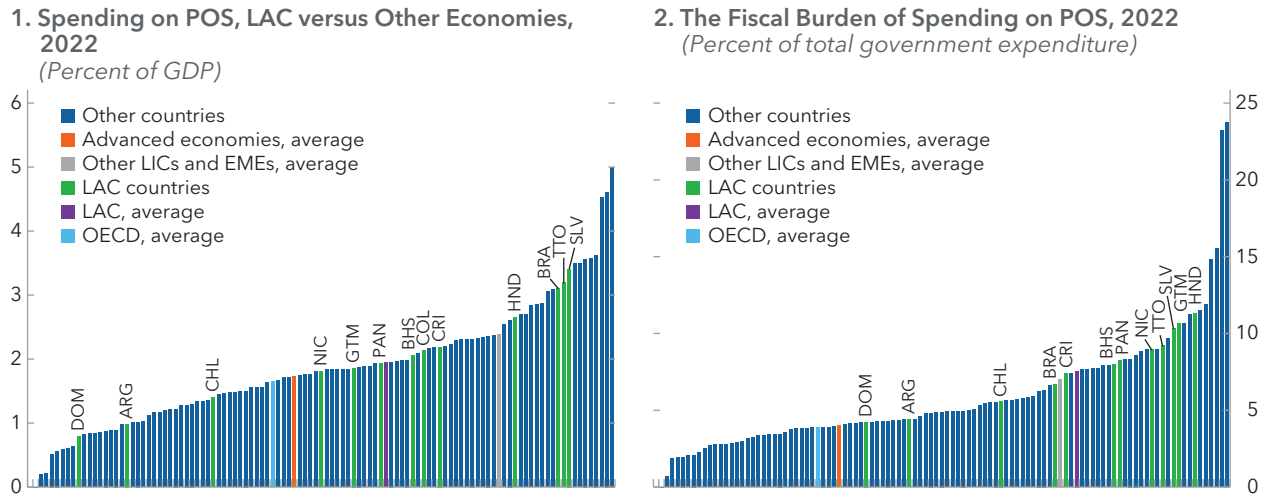
Sources: Government Finance Statistics, OECD, and Brazil National Treasury; and IMF staff calculations.
Note: EMEs = emerging market economies; LAC = Latin America and the Caribbean; LICs = low-income countries; OECD = Organisation for Economic Co-operation and Development; POS = public order and safety.

in national defense spending may sometimes be useful to assess the full fiscal burden of insecurity (Box 2). That said, a more comprehensive analysis requires more granular data disaggregating the military budget lines that are allocated to citizen security.

The composition of POS expenditures also stands out in LAC. First, spending on policing absorbs a lower share of total POS expenditures than in other regions. On average, 43 percent of total POS spending in LAC goes to the police, compared to 49 percent in sub-Saharan Africa and 59 percent in the Middle East and North Africa region (Figure 20, panel 1). This is so despite police forces having increased over time in LAC: on a scatter plot that shows police personnel per 100,000 people, compared to the same statistics 10 years prior, most LAC countries land above the 45-degree line. By comparison, police personnel per 100,000 people has been unchanged in Organisation for Economic Co-operation and Development countries, on average (Figure 20, panel 2). Second, the region has the highest proportion of POS expenditure spent on courts (37.1 percent), about double the proportion observed in advanced economies (17.2 percent).

Despite high levels of court spending and progress made on various penal and legal reforms, the judiciary in the region tends to lag in its ability to effectively prosecute and punish serious crimes (Bergman 2018). Available data suggest this may reflect the smaller number of criminal justice personnel compared to other regions. In 2021, the average number of judges or magistrates per 100,000 people in LAC was just 9.2, compared to 14.6 in advanced economies and about 21 in other emerging markets and developing economies.[38] For every 10 homicide victims, 8 suspects are convicted in Europe, about 6 in Asia, but only 2 in Western Hemisphere countries. Causes are multiple and would include structural factors like the role of organized crime in homicidal violence, but the high workload of law enforcement in the region is likely important too (UNODC 2023a). Since these numbers imply a higher risk of impunity in LAC, improving the capacity and efficiency of the judiciary sector will be critical to address violent crime and insecurity effectively.

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[38] Based on UN Office on Drugs and Crime data on Access and Functioning of Justice. 2021 is the last available year.

Figure 20. Composition of Spending on Public Order and Safety

LAC spends more on courts than other regions, though police forces have been expanding.
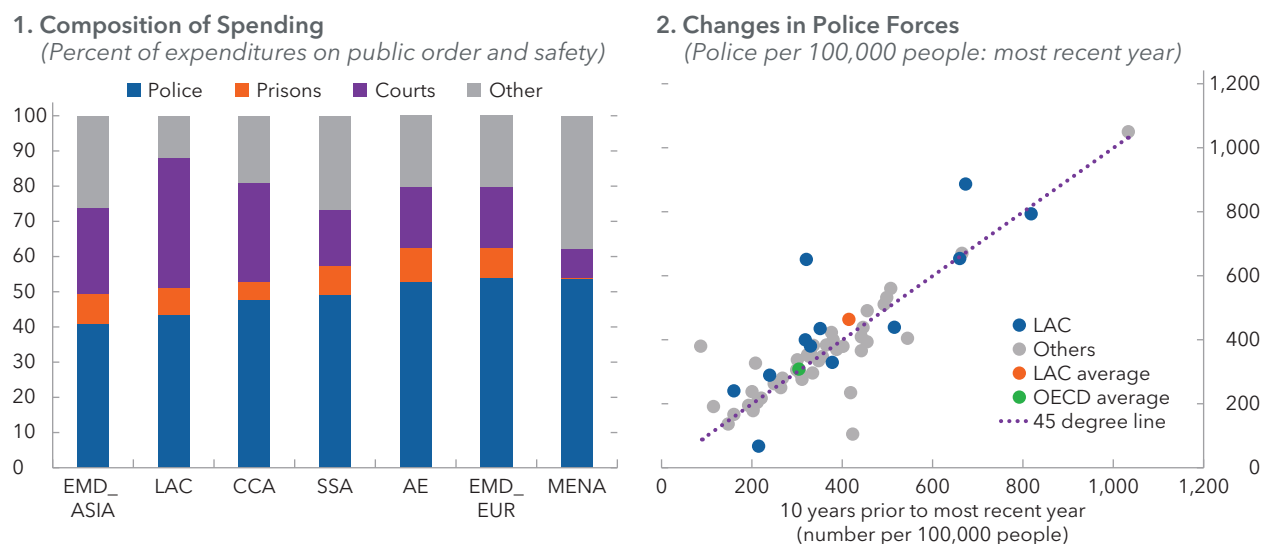
1. Composition of Spending
(Percent of expenditures on public order and safety)

2. Changes in Police Forces
(Police per 100,000 people: most recent year)

Sources: IMF, Government Finance Statistics database; Organisation for Economic Co-operation and Development; UN Office for Drugs and Crime; and IMF staff calculations.
Note: AE = advanced economies; CCA = Caucasus and Central Asia; EMD_ASIA = emerging and developing Asia; EMD_EUR = emerging and developing Europe; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; OCED = Organisation for Economic Co-operation and Development; SSA = sub-Saharan Africa.

B. The Relationship between Security Spending, Police Forces, and Violent Crime

The relationship between violent crime and spending on POS is complex and bidirectional. Cross-country data shows that homicide rates and POS spending (either expressed in percent of GDP or in per capita terms, correcting for purchasing power parity) are more positively correlated in LAC than in the rest of the world (Figure 21), which could indicate that either spending on POS is not providing the same value for money in LAC than in the rest of the world or that other factors that affect homicides are more important than spending on security in the region. In particular, while some studies find that increasing the presence of the police can reduce violent crime, especially in the short term, how policing is conducted (in particular, adopting modern techniques, hot spot policing, risk-based models to anticipate crime prevention needs, or engaging and building trust with the community) appears to matter more (Bergman 2018; Jaitman 2019).

While it is important to recognize the criticality of policing methods, understanding the relationship between criminality and spending on POS is important, especially for economic policymakers. This section leverages a large cross-country panel[39] and local projections (Jordà 2005) to examine the temporal association between changes in the homicide rate and future changes in security expenditures (a similar model also assesses the effect of homicides on the future size of the police force).[40] The same approach is then applied to explore the inverse relation, that is, how the homicide rate changes after changes in spending on POS (Figure 22):

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[39] The panel also includes macroeconomic variables from the World Economic Outlook and from the World Development Indicators databases. The resulting panel data set contains observations for 186 countries over 33 years, with full data for about 84 percent of countries.

[40] The analysis is not intended to estimate a structural model of spending on POS (the police rate) and the homicide rate. To fully identify a causal relation between homicide and spending in POS (or between spending in POS and homicide), one would have to isolate purely exogenous shocks to homicide (or spending). Absent this identification, causality cannot be fully assessed.

Figure 21. Spending on Public Order and Safety in Latin America and the Caribbean

Spending on security provision in LAC is broadly aligned with other regions, but crime is higher.

1. Crime and Spending on POS
(Homicide rates, y-axis; percent of GDP, x-axis)
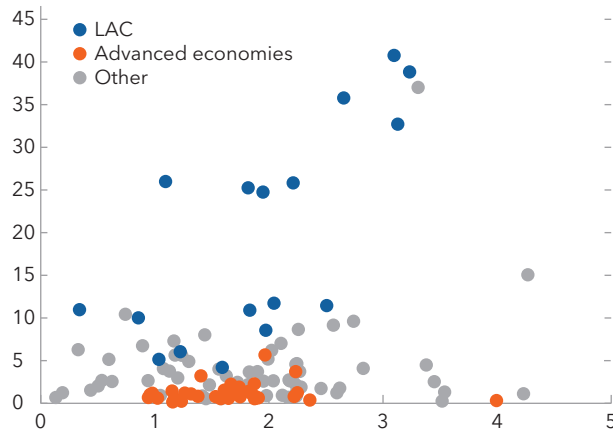
2. Crime and Per Capita Spending on POS
(Homicide rates, y-axis; per capita spending in PPP, x-axis)
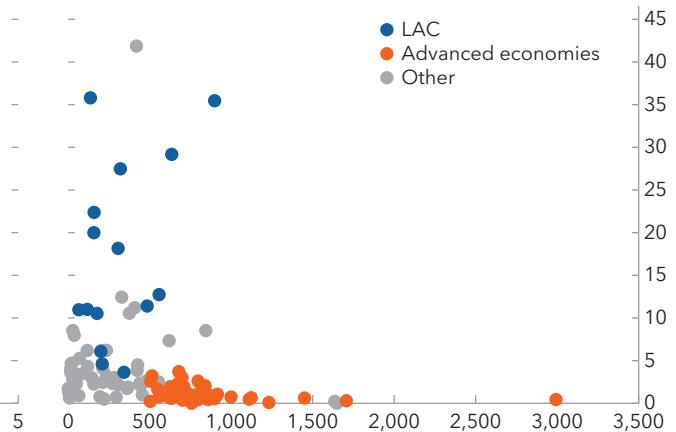
Sources: IMF, Government Finance Statistics database; Organisation for Economic Co-operation and Development; UN Office for Drugs and Crime; and IMF staff calculations.
Note: LAC = Latin America and the Caribbean; POS = public order and safety; PPP = purchasing power parity.

- *When homicides increase*: On average, countries across the world, as well as in LAC, do not spend more on POS in the years that follow crime increases, nor do they expand the police force (Figure 22, panel 1) Although there will be heterogeneity across events, and there are well-documented cases of police force expansion after bouts of violent crime, on average the estimated coefficients are not significantly different from zero at all horizons (from one to six years ahead). This result is robust to different specifications.[41]

- *When homicides decrease*: A reduction in the homicide rate can lead to a temporary, but small, decrease in spending on POS, but has no effect on the size of the police force (Figure 22, panel 2). The coefficient obtained (0.002 for all countries) implies that a 25 percent decline in the homicide rate (for instance, from 60 to 45 homicides per 100,000 people) leads to reduction of about 0.05 percent of GDP in spending on POS.[42] These results imply that expenditures on security are on average very sticky and difficult to reverse, which highlights the importance that this spending be done efficiently.

- *When security spending and the police rate go up*: The analysis shows that, for the panel covering all countries in the world, increasing POS spending by 1 percent of GDP (a very substantial increase) lowers the homicide rate by up to 18 percent after 6 years (Figure 22, panel 3). This implies that reducing the homicide rate from 20 to 15 per 100,000 people would require increasing POS spending by 1.4 percent of GDP. This is a gross cost, which does not account for the indirect benefits for public finances from higher revenues, indirectly through higher GDP (as discussed earlier) as well as directly, owing to greater law enforcement (for example, more confiscations). The result appears in line with the estimate of Gomes (2018), reported in Pessino, Izquierdo, and Vuletin (2018), who found that for Brazil, increasing POS by 10 percent (about 0.3 percent of GDP), would reduce homicides by 4 percent. Figure 22, panel 3, also shows that increasing the size of the police force by 1 percent would reduce homicides by 0.4 percent.[43]

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[41] For example, using the homicide rate instead of its natural logarithm, or controlling for per capita GDP. The result is also robust to using the full sample, that is, both positive and negative changes in the homicide rate.

[42] For LAC, the coefficient is statistically not different from zero. This means that even if one was to use the coefficient obtained using the entire panel, the impact would still be small.

[43] This elasticity implies that reducing the homicide rate from 20 to 15 per 100,000 people (a 25 percent decrease in the homicide rate) would require increasing the police rate 62.5 percent, that is from an average of 358 policepersons per 100,000 people to 581 policepersons per 100,000 people.

Figure 22. Crime, Security Spending, and Police Personnel

Over time, the dynamics of crime have little impact on security expenditures or police numbers, but increases in security expenditures and expanding police may reduce crime.

—— Elasticity of police rate (left scale)   --- Semi-elasticity of order spending (right scale)

1. Response of POS Spending and the Rate of Police per 100,000 People to a 1 Percent Increase in Homicide Rates
(Impulse response function)

2. Response of POS Spending and the Rate of Police per 100,000 People to a 1 Percent Decrease in Homicide Rates
(Impulse response function)

3. Percent Change of Homicide Rate in Response to a 1 Percent of GDP Increase in Spending on POS and to 1 Percent Increase in the Rate of Police per 100,000 People
(Impulse response function)

4. Percent Change of Homicide Rate in Response to a 1 Percent of GDP Decrease in Spending on POS and to 1 Percent Decrease in the Rate of Police per 100,000 People
(Impulse response function)

Sources: IMF, Government Finance Statistics database; UN Office for Drugs and Crime; and IMF staff calculations.
Note: The line shows the point estimate of the regression coefficient. The areas show the 90 percent confidence interval. For panels 1 and 2, the level of spending on POS in percent of GDP is regressed, at different future horizons, against the natural logarithm of the homicide rate and its lags, controlling for country fixed effects and considering only episodes when the homicide rate has increased from one year to the next. The exercise is repeated considering only episodes when the homicide rate has decreased from one year to the next. The estimated regression coefficient on the logarithm of the homicide rate captures the response of spending on POS, in percent of GDP, at different time in the future, to a 1 percent increase in the homicide rate. For panels 3 and 4, the analysis uses the natural logarithm of homicide to capture the percent change in the homicide rate to a 1 percent of GDP change in spending and to a 1 percent change in the police rate. Depending on the variables considered and the time horizon, estimates are based on panels with between 66 and 103 countries, and eight observations per country, on average. POS = public order and safety.

However, these findings do not hold when estimating the model only on LAC countries, possibly because of the low value for money of POS spending in LAC (Pessino, Izquierdo, and Vuletin 2018) or because of the importance of other factors.

▪ *When either spending or the police rate goes down*: Conversely, although the homicide rate increases in response to cuts in POS spending (Figure 22, panel 4) and in response to a reduction in the size of the police force, the confidence intervals are large, so it is not possible to ascertain that such decreases in POS spending would lead to increases in homicides.

These results should be taken with caution, as the evidence that greater police deployment reduces crime is mixed. Di Tella and Schargrodsky (2004) and Draca, Machin, and Witt (2011) found that, in the aftermath of terrorist attacks, the deployment of police officers deters crime, with varying impact outside the area where police presence is increased. Blattman and others (2019) find that increasing police and municipal services in Bogotá deterred crime, but that in most cases crime was spatially displaced to adjacent streets. Facchetti (2024) finds that drastic cuts in spending resulting in the closure of police stations (but maintaining police personnel) in London resulted in more violent crimes, reduced clearance rates, reduced reporting of nonviolent crimes, and lower house prices in affected areas. Studies reviewed by Jaitman (2019) confirmed the short-term effect of police deployment on crime, but also underscored the role of various police strategies (such as hot spot or problem-oriented policing).

Box 2. The Fiscal Burden of Security Provision in Mexico

Protracted military deployments against organized crime in Mexico began in 2006. As of July 2024, about 113,000 army and navy personnel were supporting public security operations, more than a third of the total military personnel. In addition, the national guard—a federal gendarmerie created in 2019—had about 100,000 personnel also tasked with ensuring domestic security (Government of Mexico 2024). Examining trends in military expenditure can therefore usefully complete the picture of the fiscal burden of security provision (Figure 2.1). As a percent of GDP, federal expenditure on police peaked in 2011 and was at a historical low in 2022. Conversely, military spending was relatively constant between 2011 and 2018, and peaked after 2019, when armed forces' duties were expanded to civilian law enforcement tasks (Diario Oficial de la Federación 2020). However, the recent trend could also reflect other additional civilian activities transferred to the army, such as custom administrations or the management of large infrastructure projects. Expenditures on courts reached its highest point in 2016 and has been declining since. Throughout this period, homicide rates increased steadily between 2007 and 2011, and then declined before settling at high levels since 2018. Further public finance analysis would be needed to ascertain the precise amount of defense expenditures allocated to policing functions and their impact relative to public order and safety spending.

Box Figure 2.1. Homicides and Security Spending in Mexico, 2007-22
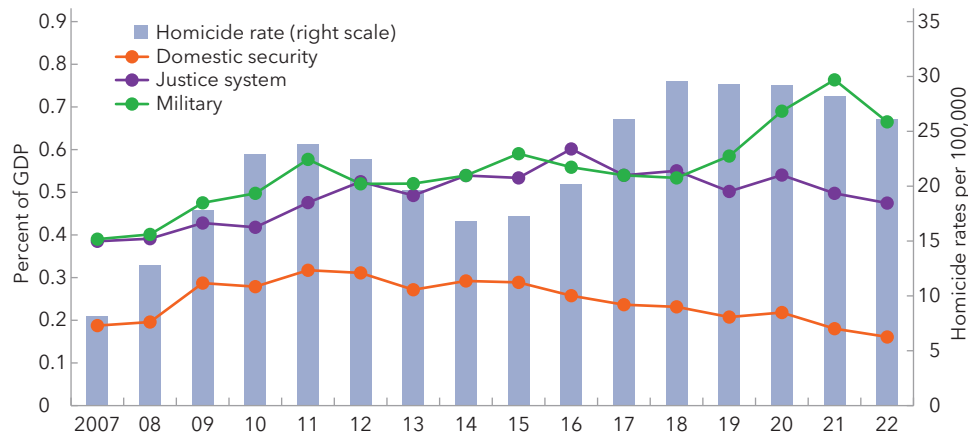
Source: Authors' calculations; Institute for Economics and Peace (2023); and UN Office for Drugs and Crime.

8. Policy Lessons

Addressing the roots and ramifications of violent crime and insecurity in LAC will require increased efforts from policymakers across sectors and levels of government, as well as from their international partners. These efforts range from better-targeted investments to improve social, development, and health outcomes in vulnerable areas—and therefore strengthen prevention—to greater emphasis on reforms that enhance the accountability, efficiency, and effectiveness of the criminal justice sector. Furthermore, these interventions require a rich repository of knowledge, as well as reliable and granular data and lessons learned that can facilitate scalable solutions (Chinchilla and Vorndran 2018). While economic policies are only one piece of this puzzle, they are fundamental to lasting success.

First, *data and analytics on crime* that lead to more accurate and timelier surveillance are crucial to inform all decision making, as well as to monitor and evaluate the effectiveness of policies. Since violent crime and insecurity in LAC manifest in vulnerable areas and "pockets of fragility," a more granular and timely understanding of the drivers of crime and their local economic effects could help better tailoring of reforms and allocation of budget resources by locality and across sectors (social, infrastructure, security). Ensuring the availability of these crime data is therefore an important first step. Traditional indicators of insecurity could also be complemented by indirect proxies at higher frequency—such as the crime-related news indicator proposed in this paper—to enhance monitoring of the relationship between crime and the economy. Leveraging crime data for economic surveillance could also enrich cooperation between governments, international financial institutions, UN agencies, academics, and civil society in building a better evidence base.

Second, while the relationship between economic variables and crime is complex, *economic policy* can have a preventive role in helping minimize the proliferation of violent crime. The analyses presented in this paper underscore the role of macroeconomic stability, well-targeted safety nets, efficient social spending, and robust institutions in addressing crime effectively. Security is enhanced by fostering an environment of economic stability, with well-designed education and social protection and insurance policies, that contain poverty, unemployment, and inequalities. In fact, policies improving high-quality schooling and job opportunities for youth can weaken recruitments of criminal organizations by increasing the rewards to education and employment.[44] Given that violent crime tends to be concentrated in the proximity of national borders, key transportation infrastructure, and coastal areas, a mix of policies that promote inclusive growth, including place-based policies, and stronger rule of law can help reduce crime-inducing socioeconomic conditions on a larger scale. Evidence-based policymaking to address insecurity and support those affected by it would benefit from rigorous policy evaluations and cross-country comparative analyses to identify the most effective measures.[45]

Third, the importance of strong institutions, in particular *the rule of law*, cannot be overstated—they are essential in ensuring the implementation of policies and in providing the necessary resilience against the multifaceted nature of crime, including organized crime. Actions targeted against corruption, including that of the police and the judiciary, not only enhance the effectiveness of the provision of services, but also improve trust, encouraging more filing with the police and reducing impunity. Anti–money laundering policies can also mitigate governance weaknesses (IMF 2023b) and reduce incentives to commit crimes (Ferwerda 2013). These policies help limit the distortions to economic activity (for example, from potential

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[44] For instance, Priesto-Curiel, Campedelli, and Hope (2023) emphasize the importance of reducing cartel recruitment to lower violent crime in Mexico.

[45] For example, see the IDB's Plataforma de Evidencias on public security and justice, which compiles scientific evaluations of policies aimed at addressing crime risk factors and the needs of those affected by crime.

increase of extortions linked to increased controls on businesses). Given the growing complexities of crime, efforts will be required to enhance international cooperation to fight illicit drugs, firearms trafficking, and money laundering through better intelligence sharing and joint operations.

Fourth, ministries of finance can play a crucial role in advancing the *effectiveness of citizen security strategies*. Historical data suggest that reducing homicides by solely scaling up spending on public order and safety could prove very expensive, highlighting the need for a more careful assessment of the effectiveness of this spending. Standard public financial management analysis could be extended to all institutions involved in the provision of internal security (including the police, courts, and elements of the armed forces) to arrive at a more accurate estimate of security sector expenditures and to allow proper discussion of budget allocations and associated trade-offs. In addition, when crime-related shocks occur, estimates of the associated security costs should be integrated in the assessment of fiscal risks and sustainability, a task that would require combined expertise form a variety of institutions. Relevant line ministries and institutions in the security and justice sector could also benefit from assessments of the quality of budget execution and reporting to help improve intrasectoral allocation of resources and address potential governance issues (Harborne, Dorotinsky, and Bisca 2017). To advance these efforts, development partners could scale up financial and technical assistance to the implementation of nationally led public expenditure reviews that examine the affordability, efficiency, effectiveness, and transparency of security expenditures. World Bank experiences in Mexico (2016) and Peru (2017) and regional studies on security spending (Pessino, Izquierdo, and Vuletin 2018) are important starting points for a more systematic analysis of the fiscal dimensions of security in LAC.

The paper presents key policy insights and identifies areas for further research and collaboration. Moving forward, there is significant potential to harness country experiences and the knowledge accumulated by policymakers, academics, civil society, and development partners to tackle crime more effectively. While country-specific conditions are important, it is crucial to draw lessons from international experiences. As a first step, immediate consideration should be given to the establishment of a collaborative regional knowledge platform to support regular exchanges between ministries of finance and security officials, data collection, security sector public financial management analysis, and the dissemination of best practices on effective economic and security policy responses to crime and violence.

Annex I. Drivers of Crime and Violence in Latin America and the Caribbean

This annex presents a synthesis of socioeconomic drivers of crime in the LAC region, drawing a review of recent academic studies and policy reports. Determinants of crime and violence are complex and defy monocausal explanations. They include:

- *Income levels*: According to the World Bank, the cross-country relationship between homicides and GDP per capita can be approximated by an inverted U shape: as countries grow richer, both the opportunities for crime and the returns to criminality increase initially. However, the opportunity cost of crime also increases in the form of forgone wages in legal activities and the consequences of arrest. It is also possible that as incomes grow, citizens and the private sector increase their demand for security and justice (Chioda 2017).

- *The speed of growth and institutional development*: Growth acts as a protective factor and can help minimize the need for crime. World Bank analysis estimates that a 1 percentage point increase in the growth rate of GDP is related to roughly 0.24 fewer homicides per 100,000 (all else equal, including income per capita). But for gains to be sustainable, the strength and credibility of judicial systems and law enforcement institutions must improve in tandem with economic development (Chioda 2017).

- *Structural factors*: Croci and Chainey (2022) review the literature on the impact of socioeconomic characteristics—inequality, poverty, unemployment, and education—on crime, and find the evidence is mixed. They posit that effective governance and controlling corruption play a more decisive role. Oberwittler (2019) finds that decreases in homicides worldwide were correlated with reductions in poverty and income inequality, investments in welfare policies and gender equality, and improvements in the legitimacy of state institutions. Jaitman (2019) shows that LAC is an exception: lethal violence has endured despite lower poverty rates and progress made in education and health indicators. Schargrodsky and Freira (2021) posit that only the association between inequality and crime is consistently robust. Dell, Feigenberg, and Teshima (2019) argue that job opportunities can play a key role as a driver of the opportunity cost of engaging in crime, showing that weaker manufacturing job prospects caused by competition with China has spurred violence in Mexico. Demography also matters: in the Americas, young males aged 15 to 29 accounted for 47 percent of suspects brought into formal contact with the criminal justice system for intentional homicide in 2021 (UNODC 2023b). Crime and violence also worsen gender inequalities in labor markets, with women facing significant barriers to employment, often reducing their workforce participation due to fear of victimization or intimate partner violence (De Hoop, Tribin, Velásquez 2024).

- *"Pockets of fragility"*: Social and spatial divides in cities or regions can deepen inequality and create fertile ground for organized crime groups, street gangs, and private security entities substituting the role of the state. For instance, poverty in LAC encompasses about 25 percent of the urban population, and about 160 million people live in low-income informal settlements lacking title and access to basic services (Alvarado and Muggah 2018). About 50 percent of crime across all crime types occur in just 2.5 percent of the street space in LAC (Chainey and Monteiro 2019). According to the IDB, these dynamics favor the concentration of "pockets of fragility"—cities or territories where populations are subject to extremely weak state capacity and/or different criminal forms of governance and service provision (IDB 2024).

- *Organized crime*: About 50 percent of homicides in the region are linked to organized criminal groups and gangs, more than twice world average. This is especially true in cities and provinces where competition over criminal activities and the control of markets between criminal organizations is high, thereby increasing intentional killings (UNODC 2023b). In contrast, the ability of a single group to consolidate criminal activities can lead to a reduction in homicides, known as "pax mafiosa" (UNODC 2023b).

- *Access to firearms*: Yet another factor that sets the region apart is the mechanism of homicide: In LAC, almost 70 percent of homicides were perpetrated using firearms in 2021, compared to 47 percent globally (UNODC 2023b). This trend has been consistent over the past decade.

Annex 2. Drivers of Crime: A Macro-Panel Approach

A. Macro-Panel Data

This annex provides additional details for the results in Chapter 5. The following model is estimated to investigate the drivers of homicides:

$$Y_{i,t} = \alpha_i + \delta_t + X'_{i,t-1}\beta + \varepsilon_{i,t} \tag{A.1}$$

- The dependent variable $Y_{i,t}$ is the logarithm of homicides per 100,000 people for country *i* in year *t*.

- α_i and δ_t are country and time fixed effects.

- $X_{i,t}$ are country-specific explanatory variables that vary over time. $X_{i,t}$ includes variables that capture institutional, macroeconomic, social, and demographic variables. $X_{i,t}$ includes (1) the rule of law index from the World Bank's Worldwide Governance Indicators database, (2) a negative growth dummy that takes a value of 1 when annual GDP growth is negative in a given year, (3) a high inflation dummy that takes a value of 1 when consumer price inflation is above 10 percent in a given year, (4) the Gini index, (5) the logarithm of a country's population, (6) the logarithm of the share of youth males in total population, and (7) the logarithm of GDP per capita.

A few additional comments are required. First, the rule of law indicator from the Worldwide Governance Indicators database captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. It is calculated from a state-space model to capture the underlying trend from a large set of indicators related to the rule of law (see Kaufman, Kraay, and Mastruzzi 2010 for further details).[46] The analysis uses the estimate of the governance score that ranges approximately from –2.5 to +2.5 where higher values correspond to better governance. Second, to facilitate statistical inference, years in which observations for homicides and the Gini index are missing are interpolated.

The sample extends from 1997 to 2021 and includes up to 104 emerging market and developing economies. The start date of the sample is governed by the data availability of the rule of law index. Endogeneity concerns in equation (A.1) are addressed by lagging the explanatory variables by a year, as well as including country and time fixed effects in the regressions. Standard errors are clustered at the country-time level, which is the unit of the treatment in this analysis that varies over time and across countries. Annex Table 2.1 shows the results.

The analysis is then further extended by considering the role of US firearms production in driving homicides in LAC. The testable assumption of this exercise is that a fraction of US firearms production will be used for homicides in neighboring countries such that an increase in US firearms production is associated with higher homicides in neighboring countries.

US firearms production statistics are obtained from "Firearms Commerce in the United States: Annual Statistical Update" from the Bureau of Alcohol, Tobacco, Firearms and Explosives. Total firearms production from the "Annual Firearms Manufacturing and Exportation Report" is used. The "Annual Firearms

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[46] The list of indicators used to calculate the rule of law indicator is available from the following link: https://www.worldbank.org/content/dam/sites/govindicators/doc/rl.pdf

Annex Table 2.1. Macroeconomic, Institutional, and Regional Drivers of Crime
(Dependent variable: Logarithm of homicides per 100,000 people [columns (A)–(C)] or homicides per 100,000 people [column (D)])

Independent Variables	Coefficients			
	(A)	(B)	(C)	(D)
Rule of law	−0.185***	−0.225***	−0.245***	−1.720*
	(0.067)	(0.064)	(0.047)	(0.932)
Negative growth	−0.107**	−0.077*	−0.087**	−0.325
	(0.051)	(0.044)	(0.040)	(0.469)
Negative growth x LAC dummy	0.133*	0.133*	0.129**	1.253
	(0.076)	(0.075)	(0.055)	(1.869)
High inflation dummy	0.099***	0.086***	0.101**	0.844*
	(0.030)	(0.029)	(0.026)	(0.434)
Gini	−0.172***	−0.172***		−0.158***
	(0.055)	(0.055)		(0.059)
Gini x LAC dummy	0.257***	0.291***		0.753***
	(0.084)	(0.080)		(0.211)
Controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	No	Yes	Yes
Observations	1,259	1,259	1,928	1,259
Number of countries	81	81	104	81
Adj. *R*-squared	0.93	0.93	0.92	0.88
Within *R*-squared	0.18	0.27	0.10	0.06

Source: IMF staff calculations.

Note: Standard errors are in parentheses and are clustered at the country-time level. Explanatory variables are lagged by a year. Controls include the logarithm of a country's total population, the logarithm of youth males in total male population, and the logarithm of GDP per capita. The Gini index is standardized in columns (A) to (C). Negative growth and inequality are negatively associated with homicides in the short term in non-LAC countries. However, in LAC countries, negative growth and inequality have a positive total effect on homicides ranging from 2.6 percent to 5.6 percent for negative growth and 8.5 percent to 11.9 percent for inequality, highlighting regional disparities in these associations [columns (A) to (C)]. The interaction term between inflation and LAC was not included in the regression because it was not significant. In column (D), for comparability with Schargrodsky and Freira (2021), homicides per 100,000 people not in logarithmic form are used as the dependent variable. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. FE = fixed effects; LAC = Latin America and the Caribbean.

Manufacturing and Exportation Report" excludes production for the US military, but includes firearms purchased by domestic law enforcement agencies and firearms manufactured for export. Distance to the United States is calculated using the Centre d'Études Prospectives et d'Informations Internationales simple distance between most populated cities of each country in kilometers (for example, New York City for the United States and Mexico City for Mexico).

The econometric specification is the following:

$$Y_{i,t} = \alpha_i + \alpha_i + US\ firearms_t \times Dist_i + X'_{i,t-1}\beta + \varepsilon_{i,t} \tag{A.2}$$

- The dependent variable $Y_{i,t}$ is the logarithm of homicides per 100,000 people.

- α_i and α_i are country and time fixed effects.

- $X_{i,t}$ are the same variables as in the previous exercise.

- $US\ firearms_t$ is the change in the logarithm of total firearms production.

- $Dist_i$ is the logarithm of the opposite of the distance to capture how close a country is from the United States. Annex Table 2.2 shows the results.

Annex Table 2.2. Homicides and US Firearms Production in Latin America and the Caribbean
(Dependent variable: Logarithm of homicides per 100,000 people)

Independent Variables	Coefficients	
Rule of law	–0.539***	–0.471***
	(0.073)	(0.045)
Firearms	4.349***	
	(1.667)	
Firearms x distance to United States	0.496**	0.474**
	(0.201)	(0.069)
Negative growth dummy	0.046	–0.016
	(0.043)	(0.197)
High inflation dummy	0.071	0.112**
	(0.045)	(0.049)
Controls	Yes	Yes
Country FE	Yes	Yes
Time FE	No	Yes
Observations	533	533
Number of countries	29	29
Adj. *R*-squared	0.84	0.85
Within *R*-squared	0.15	0.15

Source: IMF staff calculations

Note: Standard errors are in parentheses and are clustered at the country-time level. Explanatory variables are lagged by a year. Controls include the logarithm of a country's total population, the logarithm of youth males in total male population, and the logarithm of GDP per capita. The Gini index is not included in these regressions to increase the sample size to 29 countries instead of 15 countries when including the Gini index. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. FE = fixed effects.

B. Cross-Country Regression

To strengthen the causal interpretation of the macroeconomic panel approach, this analysis considers the average of the logarithm of the homicide rate for a given country between 2001 and 2021 as the dependent variable, using the predetermined values of the following explanatory variables (that is the 2000 observations): The Gini Index and Worldwide Governance Indicators Rule of Law index, controlling for GDP per capita, youth bulge, total population, and a regional dummy for LAC countries.

The following specification is therefore used:

$$Y_c = X_c'\beta + \varepsilon_c$$

- Y_c is the average of the logarithm of the homicide rate between 2001 and 2021 for country c.

- X_c'' are country-specific variables in 2000, which helps address endogeneity issues.

The main results support the original conclusions on the importance of inequality and rule of law in driving homicides (Annex Table 2.3).

Annex Table 2.3. Average Homicides and Their Socioeconomic and Institutional Drivers
(Dependent variable: Logarithm of homicides per 100,000 people, 2001–21 average)

Independent Variables	Coefficients
LAC	0.948***
	(0.327)
Rule of law	–0.379**
	(0.169)
Gini	0.039**
	(0.015)
Controls	Yes
Observations	77
R-squared	0.54

Source: IMF staff calculations
Note: Robust standard errors are in parentheses. Explanatory variables correspond to observations in year 2000. Controls include the logarithm of a country's total population, the logarithm of youth males in total male population, and the logarithm of GDP per capita. The Gini index is standardized. LAC is a regional dummy for Latin American and Caribbean countries. *p < 0.10; **p < 0.05; ***p < 0.01.

C. Victimization Survey

This analysis uses the Latin American Public Opinion Project household survey conducted by Vanderbilt University on an annual or biannual basis. It covers 34 countries starting from 2004. Survey participants are voting-age adults and surveys are conducted based on face-to-face interviews except for Canada and the United States, where a web-based survey is used.

The question on crime used in the analysis is the following: "Have you been a victim of any type of crime in the past 12 months? That is, have you been a victim of robbery, burglary, assault, fraud, blackmail, extortion, violent threats, or any other type of crime in the past 12 months?" That question is available for most countries

starting from the 2010 survey. Unlike the macroeconomic panel analysis that focused on explaining homicide rates across countries and over time, the question from the Latin American Public Opinion Project refers to crime in general.

The following specification is used to investigate how institutional, social, and economic factors affect crime

$$Y_{i,t} = \alpha_c + \delta_t + X'_{c,t-1}\beta + Z'_i\theta + \varepsilon_{i,t}$$

- $Y_{i,t}$ is the answer to the question on crime above from individual i at time t.

- α_c is a country fixed effect and δ_t is a time fixed effect.

- $X'_{c,t-1}$ are country-specific variables that vary over time—the rule of law indicator, a negative growth dummy, and the Gini index.

- Z'_i are individual characteristics—gender, age, and education.

The main results—which support the original conclusions of the macroeconomic panel analysis—are as follows (Annex Table 2.4):

- A one standard deviation increase in rule of law is associated with a 2.4 percentage point drop in victimization rate.

- A 10 point increase in the Gini index is associated with a 4.1 percentage point increase in the victimization rate.

- Being in a negative growth episode is associated with a 1.7 percentage point increase in victimization rate.

Annex Table 2.4. Victimization Survey and Its Socioeconomic and Institutional Drivers
(The dependent variable is the answer to the question "Have you been a victim of any type of crime in the past 12 months? That is, have you been a victim of robbery, burglary, assault, fraud, blackmail, extortion, violent threats, or any other type of crime in the past 12 months?")

Independent Variables	Coefficients
Rule of law	–0.024**
	(0.012)
Negative growth dummy	0.017**
	(0.007)
Gini	0.004***
	(0.001)
Controls	Yes
Country FE	Yes
Time FE	Yes
Observations	137,343
Number of countries	17
R-squared	0.04

Source: IMF staff calculations.
Note: Standard errors are in parentheses. Controls include gender, age, and education. The Gini index is not standardized.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. FE = fixed effects.

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