

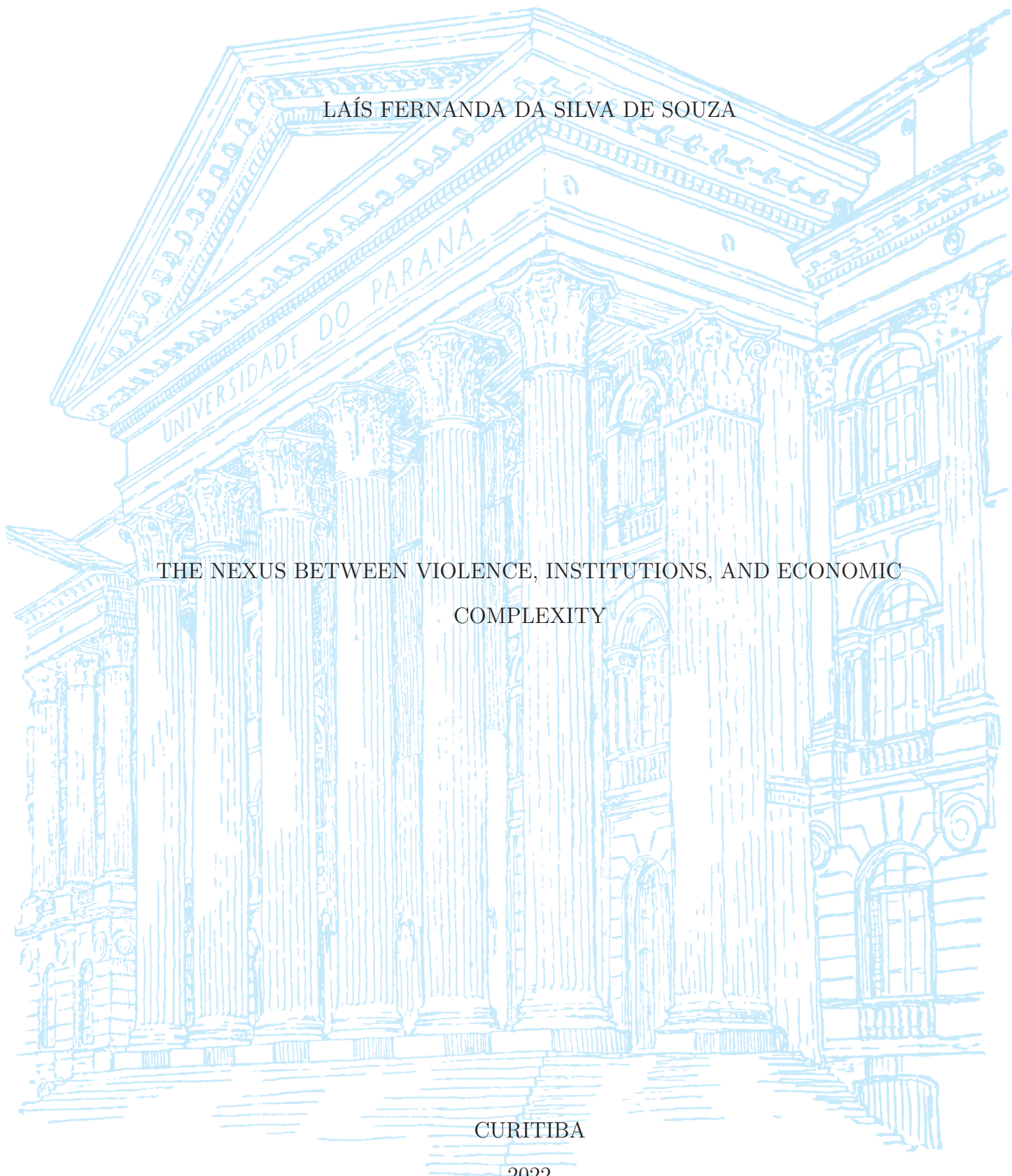
UNIVERSIDADE FEDERAL DO PARANÁ

LAÍS FERNANDA DA SILVA DE SOUZA

THE NEXUS BETWEEN VIOLENCE, INSTITUTIONS, AND ECONOMIC
COMPLEXITY

CURITIBA

2022



LAÍS FERNANDA DA SILVA DE SOUZA

THE NEXUS BETWEEN VIOLENCE, INSTITUTIONS, AND ECONOMIC
COMPLEXITY

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JOÃO BASILIO PEREIRA NETO

Presidente da Banca Examinadora

Assinatura Eletrônica

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FRANCISCO ADILSON GABARDO

Avaliador Externo (40001016)

Assinatura Eletrônica

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DOMINIK HARTMANN

Avaliador Externo (UNIVERSIDADE FEDERAL DE SANTA CATARINA)

To my father, for dreaming this dream long before I did. To my mother for helping me make this dream come true. To all the Divine beings for their strength and protection. May all beings benefit from the fruits of my work.

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RESUMO

Nas pesquisas sobre homicídios, os estudiosos tem se dedicado à identificação das causas socioeconômicas da violência letal. Nesta dissertação, defendo que é necessário trazer o Estado para a análise e examinar como as instituições contribuem diretamente para a violência. Partindo das sugestões da economia e da ciência política sobre a presença de um nexo entre instituições e desenvolvimento, argumenta-se que as diferenças nas características institucionais também podem resultar em variações nos homicídios. Seguindo a tese central de Durkheim em *A Divisão do Trabalho* (1984 [1893]), argumenta-se também que, onde a especialização econômica é altamente complexa e há uma grande diversidade nas atividades produtivas, a crescente interdependência entre os indivíduos pode mudar os interesses coletivos em direção a uma maior solidariedade e tornar as sociedades menos propensas a aceitar atos que prejudiquem a si mesmas, como os homicídios. A conexão estatística entre violência, instituições e complexidade econômica é explorada usando regressão pooled OLS para 69 países de 2000 a 2019. O Índice de Complexidade Econômica (ECI, da sigla em inglês) é usado para analisar como o avanço na especialização das tarefas sociais e econômicas está relacionado às variações nas taxas de homicídios entre países. Os resultados sugerem que a estrutura produtiva está intimamente relacionada com a variação nos homicídios, tanto para nações desenvolvidas quanto para nações não-desenvolvidas. Entretanto, a relação entre as taxas de homicídios e o ECI depende do estágio de desenvolvimento em que os países se encontram. Para os países não-desenvolvidos, os resultados sugerem que a complexidade das atividades produtivas primeiro aumentaria e depois diminuiria as taxas de homicídios. Por outro lado, os resultados para os países desenvolvidos não mostram evidências de que a parte ascendente da curva que relaciona taxas de homicídios e complexidade econômica esteja operando no sentido de aumentar os homicídios nesses países. Uma maneira de reduzir as taxas de homicídios nas nações não-desenvolvidas está dentro do próprio processo de industrialização. As evidências do presente estudo sugerem que o aumento das taxas de homicídios tenderia a ser atenuado nas etapas posteriores do processo de sofisticação industrial. Entretanto, até que alcancem os estágios mais avançados de especialização das tarefas produtivas, os países não-desenvolvidos devem buscar maneiras de criar um contrapeso para as forças socioeconômicas que pressionam a violência letal para cima. A variável institucional que mede o controle da corrupção mostrou ser outro fator significativo que poderia somar-se aos avanços na complexidade econômica como forma de contribuir para a desescalada dos homicídios nos países mais violentos do mundo.

Palavras-chave: Homicídios. Crimes violentos. Instituições políticas. Modernização. Especialização econômica.

ABSTRACT

Within research on cross-national homicides, scholars focus on identifying the socio-economic causes of lethal violence. Here, I argue that it is necessary to bring the state into the analysis by examining how the institutions directly contribute to violence. Building on the suggestions from economics and political science on the presence of a nexus between institutions and development, it is argued that the differences in institutional characteristics may also result in variations in homicides. Following Durkheim's central thesis in the *Division of Labor* (1984 [1893]), it is also hypothesized that where the economic specialization is very complex and there is a great deal of diversity in productive tasks, the growing interdependence between individuals may change collective interests toward greater solidarity and make societies less likely to accept acts that might disrupt themselves, such as homicides. The statistical connection between violence, institutions, and economic complexity is explored using pooled OLS regression for 69 countries from 2000 to 2019. The Economic Complexity Index (ECI) is used to analyze how the advance in the specialization of social and economic tasks is related to variations in rates of homicides across countries. The results suggest that economic structure is closely related to homicide variation in developed and non-developed nations. However, the relationship between homicide rates and ECI depends on the stage of development in which societies find themselves. For non-developed countries, the results suggest that the complexity of productive activities would first raise and then decrease homicide rates. On the other side, the results for developed countries do not show evidence that the ascending part of the curve that relates homicide rates and economic complexity is operating in the sense of increasing homicides in these countries. One way to reduce homicide rates in non-developed nations lies within the process of industrialization itself. The evidence from the present study suggests that the increase in homicides would tend to be attenuated in the later stages of the process of industrial specialization. Nevertheless, until the most advanced stages of economic specialization arrive, non-developed countries must find ways to create a counterweight to the socio-economic forces that press lethal violence upward. The institutional variable of control of corruption showed to be another significant factor that could add to the advances in economic complexity to contribute to the de-escalation of homicides in the world's most violent countries.

Keywords: Cross-national homicides. Violent crime. Political institutions. Modernization perspective. Economic specialization.

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1 Introduction

The significance of violence as a development problem is highlighted in Sustainable Development Goals (SDG 16). The concern about violence is legitimate. Serious violence in the form of homicides is among the ten leading causes of death globally (WHO, 2014). Only in 2019, homicides killed an estimated 474,692 people worldwide (World Health Organization, 2021). Violence brings suffering and imposes high costs in many ways. They include direct suffering from lost lives and injuries, psychological trauma to families and community, the destruction of public infrastructure and personal assets, disruption of public services provision, increasing expenditure on judicial systems, brain drain, and reduced economic growth (United Nations Office for Drugs and Crime, 2019; World Bank, 2011).

The standard approach in cross-national homicide studies tries to explain extreme levels of homicides focusing on identifying the socioeconomic causes of violence (Fajnzylber et al., 2002; Rennó Santos et al., 2022; Savolainen, 2000). Although previous research has made substantial progress in understanding the role of inequality, poverty, and economic development in explaining cross-national homicide rates, it is less clear how poor institutional and economic structures – of which inequality and poverty are symptoms – affect violence. Specifically, this dissertation examines to which extent institutional characteristics interrelate with the economic structure to shape an environment where violence can easily proliferate. In the deadliest countries, institutions and productive structures have organized society into socio-economic groups interested in accommodating a violent order. To see this, we must consider the productive structure and institutions as the basis for forming societal interests. They are responsible for directing norms and behaviors necessary to perpetuate violence in these societies, which, in turn, have impacted homicide rates.

Since the early seventeenth century, when modern states arose as political entities, institutions' function in building order and reducing violence has rested on their capability

to enforce agreements through the control of the legitimate means of violence (Elias, 2000 [1939]; Hobbes, 2014 [1651]). However, in the deadliest countries, the state does not build legitimacy based on acquiring a monopoly over the means of violence. Instead, some state members share the control of the legitimate means of violence, acting in complicity with criminals on behalf of political and private interests. Although some studies assume institutions can shape violence, past research has discounted or even ignored the effects state actors' relations with criminals may have on cross-national variation in homicides. Institutions may directly contribute to violence through the links state actors sustain with criminals. Through complicit relations with criminals, actors operating inside the state protect their privileged positions and use this symbiotic relationship to build political and economic power and accomplish goals that may be unattainable without the skilled use of violence (Hristov; 2014; Kleinfeld, 2018; Moncada, 2013). Prominent state members involved in the perpetration of crimes can shape state policies and decision-making practices and are unlikely to implement even the most tested technical solutions to solve violence problems.

Furthermore, a structural affinity exists between the interests of violent privileged groups and a country's productive structure. Although economic structure are not traditionally considered a homicide issue, evidence indicates that economic structure is crucial in understanding citizen security (Baier & Baten, 2017; Collier & Hoeffler, 2004; Couttenier et al., 2017). The evidence shows that dependence on the extraction of valuable resources, such as silver, gold, and diamonds, not only increases the risks of armed conflicts but also has detrimental effects on homicidal violence. However, the existing literature has focused on the role of dependence on primary commodity exports (e.g., the share of natural resources exports regarding GDP, (Baier & Baten, 2017); and the number of mineral discoveries (Couttenier et al., 2017)) to assess the effects of the economic structure on homicides quantitatively. By focusing only on the dependence on natural resources, the literature keeps the discussion open about how economic specialization towards sophisticated products impacts a countries' violence levels.

For example, industrial specialization also overlaps with other socio-political forces to shape violence. In implementing Durkheim's (1984 [1893]) distinction to understand the trajectory of homicides and industrial modernization, we can relate the first stages of the industrialization process with the disruption of many well-established norms and traditions that used to restrain violence. Durkheim argues that as specialized activities develop, social bonds derived from similarities gradually decrease, exerting less force in sustaining solidarity among individuals. No longer having the same counterweight, violent tendencies would manifest more easily, and we could expect a dissolution of social life and an escalation of violence. However, Durkheim's demonstrates how the emergence of economic specialization and its new organizational forces led to a form of social organization that connects people in an even more effective way (Lee & Bankston, 1999). As the division of labor advances in societies and becomes increasingly complex, people perform increasingly diverse productive functions and social roles, developing values and interests that do not always conform (Messner, 1982). Despite intense differentiation, people increasingly depend more closely on each other for survival. Therefore, the stresses of the initial disorder phases due to rapid industrialization and the initial tendency toward increased homicides are more than offset by society's ever-increasing economic specialization.

Here, I made an effort to empirically explore the nexus between violence, institutions, and the specialization of the economic structure. We can summarize these arguments in the form of hypotheses: (1) State institutions working in complicity with criminals increase national homicide rates; (2) The complexity of the division of productive activities would first raise and then decrease homicide rates. Data on institutional quality were extracted from the World Bank's Worldwide Governance Indicators (Kaufmann et al., 2010). The choice was WGI because it is considered a reliable and comprehensive data set to examine cross-national variation in institutional quality and its relationship with violence. Three indicators on the WGI data set were identified as potential measures of the state's complicitness with criminal groups: *Voice and Accountability*, *Corruption Control*, and *Political Stability*. Voice and accountability is described as the extent to which citizens can participate democratically in choosing their rulers and the extent of freedom of expression

and association present in a society. Democracies have institutional structures that reflect the commitment of political institutions to solve conflicts peacefully through electoral competition rather than using authoritarianism and violence as alternatives to conflict resolution. Thus, higher levels of democracy (as expressed by the Voice and Accountability variable) are expected to reduce homicide rates. Corruption control is defined as the extent to which political power is exercised for private gains. Corruption control also represents the extent to which political institutions were captured by elites and private interests. Greater control of corruption is therefore expected to reduce homicide rates. Political violence is defined as the probability that a country's institutions will be overthrown by unconstitutional means or face politically motivated violence such as coups d'état, civil wars, and terrorism. The expectation is that the greater the political stability, the lower the incidence of homicides. In order to investigate how the specialization of social and productive activities affects lethal violence in societies, the Economic Complexity Index (ECI) developed by [Hidalgo & Hausmann \(2009\)](#) was employed. The recent development of measures of economic complexity has expanded our ability to quantify the sophistication and diversification of a country's productive structure ([Hidalgo, 2021](#)). Those measures that, over the 20th century, were based mainly on simple quantitative approaches (e.g., the participation of agriculture, industry, and services in the economy) have advanced in the past decade with the introduction of Economic Complexity measures. Economic Complexity Index data is available on MIT's Observatory of Economic Complexity ([Simoes & Hidalgo, 2011](#)).

Another important implication of the studies of [Durkheim & Halls \(1984\)](#) regarding the transition from traditional to modern industrial societies is that rates of lethal violence are expected to be higher in developing and transitioning economies ([Clinard & Abbott, 1973](#); [Shelley, 1981](#)). As societies grow in complexity and move from poorly-industrialized countries to industrialized ones, they experience a series of changes that can result in a significant outbreak of violence. Indeed, macroanalysis of the correlates of homicides in different societies reveals that, in general, there is a significant link between a country's homicide rate and its level of development. In general, non-developed (developing and

transitioning) countries have higher rates of homicide than developed (highly industrialized) countries ([World Health Organization, 2021](#)). Different stages of economic specialization, large variance in institutional aspects, and unequal development lead to a widening gap in homicide rates between developed countries and non-developed countries. The latter are faced with higher levels of corruption, and lower industrialization, which, combined with factors such as economic inequality and the comparatively large youth population with limited prospects, lead to an increase in homicide rates.

To empirically test hypotheses (1) and (2) considering distinctions between countries' development levels, countries were grouped into developed and non-developed according to the United Nations development classification. Pooled OLS cross-sectional regression on data for a total of 69 countries between 2000 and 2019 was used. To consider whether the ECI could impact violence in a non-linear way, ECI squared term is also included in the analysis. Key insights of this dissertation derived from the empirical analysis include that, over the last 20 years, differences in the productive structure were closely related to differences in homicide rates between countries. However, this result is different for developed and non-developed nations. The results show that countries in the intermediate economic complexity stages may experience increases in lethal violence. When added to the effects of other positive determinants of homicides, such as income inequality, urbanization, and the share of young males in the population, the rising part of the ECI-homicides curve puts further upward pressure on violence in non-developed countries, a process that is not present in developed countries anymore.

That means that an increase in lethal violent acts is expected for non-developed countries as they go through the process of industrial sophistication. One way out of the rise in homicide rates in non-developed countries lies within the industrial process itself. The evidence suggests that the increase in lethal violence would tend to attenuate. As specialized activities advance and countries reach higher levels of complexity (here represented by the quadratic term of the economic complexity index), violent acts are expected to decrease. Nevertheless, until the most advanced stages of diversification and specialization of productive tasks arrive, non-developed countries could rely on the control

of corruption to bring the violence under control. The results suggest the control of the capture of the state by private interests and the reduction of the extent to which public power is exerted for personal gain is another significant factor that can add to the advances in economic complexity as a means of contributing to homicide reduction. Countries in which the state is not complicit with violence can provide an institutional framework that does not encourage the use of violence as a tool to protect private interests.

In addition to this introduction, this dissertation is divided into seven other chapters. Chapter 2 presents the panorama of worldwide trajectories of homicide rates during the period 2000-2019. Chapter 3 explores common covariates that the literature discusses as possible explanations for cross-country variations in homicide rates. Chapter 4 intends to demonstrate from a historical perspective that violence results from complicit states deliberately giving up their monopoly on violence to cooperate with violent groups. In different countries and historical periods, states that have been unable to centralize the legitimate monopoly of violence, or have surrendered this fundamental assignment, have witnessed the spread of violence within their societies. An additional goal of Chapter 4 is to construct a theoretical framework for interpreting the relationship between structural transformations to more complex societies and violence. The proposed interpretation involves an application of the modernization theory formulated by Emile Durkheim in his influential work *The Division of Labor in Society* (1984 [1893]). Durkheim's theory is not directly related to the explanation of violence, and its relevance in this context may not be immediately obvious. Therefore, the second part of this chapter is devoted to linking Durkheim's insights into the development of societies and homicides to understand how complex societies have managed to sustain solidarity between individuals without devolving into widespread violence and social disorder, despite the profound transformations they have undergone. Chapter 5 presents the contemporary relationship between violence, institutions and economic structure. Chapter 6 delves into the relationship between violence and economic complexity. In Chapter 7, two specific hypotheses concerning the nexus between political institutions and the specialization of the economic structure will be

derived and evaluated with cross-national data on homicides. Chapter 8 offers concluding remarks.

2 Worldwide Trends in Homicides

Homicides, defined by the World Health Organization as “the killing of a person by another with intent to cause death or serious injury” ([World Health Organization, 2021](#)), represent one of the most severe offenses among all violent crimes. Since homicide is a serious offense for the victim, the perpetrator, and the general public, homicide has become a widely collected and reported statistic. Because of its lethal outcome, homicide has a relatively uniform definition throughout history and in cross-country comparison. In contrast, many other crimes are subject to interpretation and are documented differently in different national statistics ([Eisner & Fearon, 2021](#)).

Worldwide, the homicide rate, which measures homicides as a proportion of the population, is slowly declining from 2000 to 2019. From a peak of 6.94 homicides per 100,00 population in 2001, the trajectory of the last 20 years in homicide deaths notably included a period of a steady decline of about 13% between 2002 and 2007, followed by a stability period of around six homicides per 100,000 in 2008-2016, and a reduction of 5.9% between 2017-2019. However, the reduction in violence has not been uniform everywhere and hides enormous regional variations ([United Nations Office for Drugs and Crime, 2019](#)).

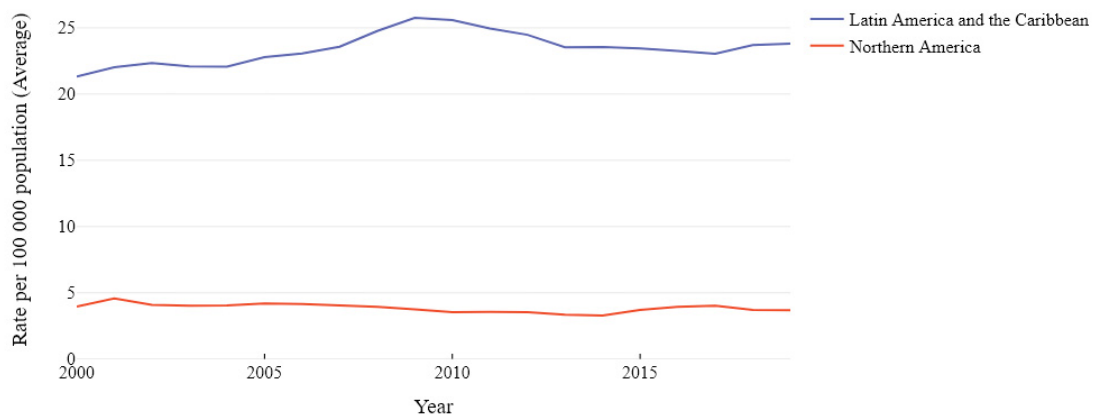
Overall, the homicide rate in the Americas has remained at high levels over the past two decades. Although the homicide rate in the region has alternated between periods of decline and increase over the period 2000-2019, the average homicide rate in the area has remained between 14.77 and 17.05 per 100,000 population, which is two to three times the global average. In Europe, the homicide rate decreased by more than 67% between 2000 and 2019, from 7.79 per 100,000 to 2.56 homicides per 100,00 population. In Asia, homicide rates declined by almost 40 percent over that same period, from 3.34 percent in 2000 to 2.03 percent in 2019. For Africa, data indicate a reduction of about 9.75 percent in homicide rates between 2000 and 2010, accompanied by stagnation at relatively high levels, around 12 homicides per 100,000 population in the last decade. While the trajectory has been one of steady decline in some regions, there have also been periods of even sharper

increases in homicide rates in others. Moreover, while a reduction in the homicide rate as a proportion of the population signals a decrease in average risk due to overall population growth, in absolute terms, nearly half a million people still lose their lives every year to homicides (United Nations Office for Drugs and Crime, 2019).

2.1 Americas

Perhaps one of the most striking features of the Americas' social context is its consistently high homicide rates. However, this persistence at a high level of violence across the hemisphere masks significant differences in homicides at the subregional level. For example, Latin American and Caribbean countries experienced an increase of nearly 20 percent in their already high homicide rate between 2007 and 2012, followed by a decrease of about 7 percent by 2015 and a further expansion of 5 percent by 2017 (Figure 2.1). Although the period from 2018 to 2019 showed a 9% reduction in the homicide rate, data for 2020 already record a new upward trend in lethal violence in the subregion (United Nations Office for Drugs and Crime, 2019).

Figure 2.1: Homicide rate estimates for America's subregions, 2000-2019

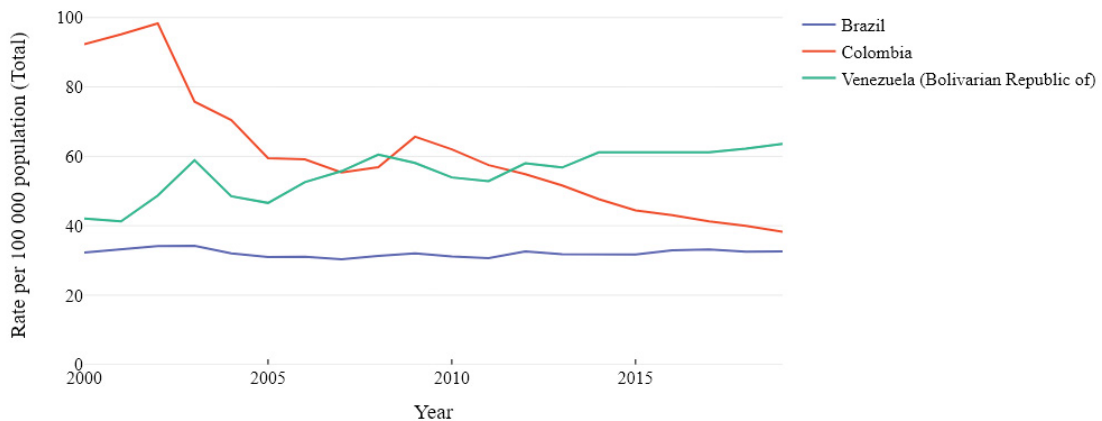


Source: Elaborated by the author with data from the United Nations Office For Drugs and Crime.

Behind these high overall rates at the subregional level, there are very different dynamics at the national level. For example, while experiencing increases and decreases in its homicide rates, over the past two decades, Colombia experienced a reduction in its homicide rates from 98.30 homicides per 100,000 inhabitants in 2002 to 38.28 per 100,000 in 2019 (Figure 2.2). In contrast, Brazil has experienced upward fluctuations in its homicide

rates, from 30.30 homicides per 100,000 inhabitants in 2007 to over 33 per 100,000 in 2017; according to the World Health Organization, over the period 2000-2019, more than 1.2 million people died from homicides in the country (World Health Organization, 2021). In the same period, Venezuela faced a steep increase in homicides, from 42.09 per 100,000 inhabitants in 2000 to 63.59 in 2019. In Caribbean, high homicide trends in El Salvador and Honduras, with homicide rates of 85 and 66.90 homicides per 100.00 population, respectively, have placed the region at the top of the global homicide rankings for years (World Health Organization, 2021).

Figure 2.2: Homicide rate estimates for selected countries in Latin America and the Caribbean, 2000-2019



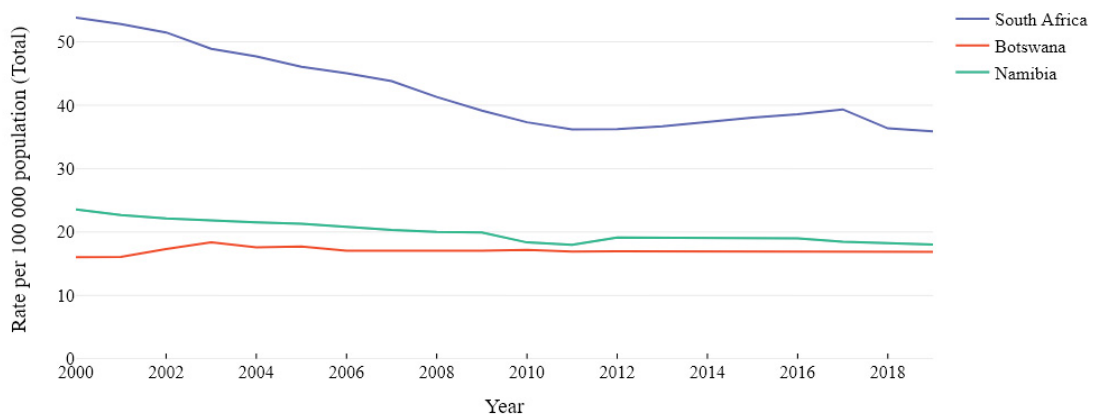
Elaborated by the author with data from the World Health Organization.

North America experienced a steady reduction in its homicide rates between 2001 and 2012, from 6.21% to 4.42% (Figure 2.1). However, starting in 2014, homicide rates in the region gradually increased and, by 2019, returned to the level of 6 homicides per 100,000 (United Nations Office for Drugs and Crime, 2019). Although Mexico is the most significant contributor to this recent surge in homicides in the region, the United States also has significant concerns on this issue. The country is unique among developed nations for being the most affluent homicidal society in the world. The USA's 2018 and 2019 homicide rates were twice as high as all European countries *combined*. In 2020, St. Louis' homicide rate of 87.83 placed it among the ten most violent cities in the world, on par with the homicide rates of the world's leading homicide countries.

2.2 Africa

The national homicide rates of South Africa, located in the Southern Africa subregion, have undergone a marked reduction over the past 20 years, from a level of 53.81 homicides per 100,000 population in 2000 to 36.18 in 2011, followed by a period of an 8.5 percent increase between 2012-2017 and then followed by a period characterized by a downward trend (Figure 2.3). Still, South Africa's homicide rate of 35.86 per 100,000 population positioned the country in the ninth position of the world's deadliest countries in 2019. While South Africa saw its homicide rates fall in the early 2000s, Botswana, located in the same subregion, recorded a 14% rise in its homicide rate; since 2011, its rates have stuck at 16 homicides per 100,000 population. The same is true for Namibia, which, despite experiencing a decrease in its homicide rates of 23.55 to 19.92 between 2000-2009, has not been able to continue the improvement, as its rates have since stagnated at 18 homicides per 100,000 population (World Health Organization, 2021).

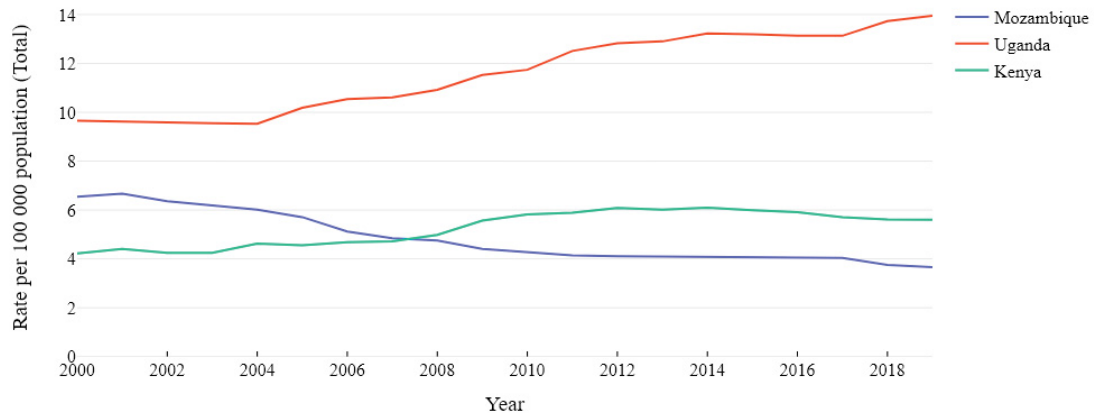
Figure 2.3: Homicide rate estimates for selected countries in Southern Africa, 2000-2019



Elaborated by the author with data from the World Health Organization.

In the Eastern Africa subregion, some countries have faced diverging trends in homicide rates. Mozambique, for example, has seen its homicide rates decline steadily over the last two decades, dropping from 6.55 to 3.66 homicides per 100,000 population over the period 2000-2019, a 44% reduction in its homicide rates (Figure 2.4). Running counter to this trend is Uganda, which has seen a steady rise in its homicide rates by another 44.4% over the past two decades, reaching a level of 13.95 homicides per 100,000

Figure 2.4: Homicide rate estimates for selected countries in Eastern Africa, 2000-2019



Elaborated by the author with data from the World Health Organization.

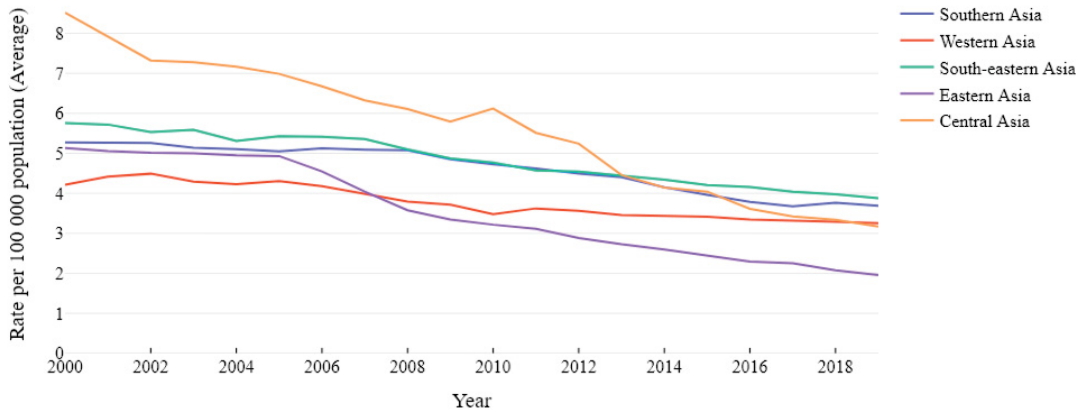
population in 2019. In Kenya, homicide rates increased in the early 2000s, peaking at 6.10 homicides per 100,000 in 2014, followed by a period of retreat, and currently stand at a level of 5 homicides per 1000,000 population ([World Health Organization, 2021](#)).

2.3 Asia

Asia has seen a steady decline in its average homicide rates in recent decades. They were the lowest in the world in 2019 (Figure 2.5). Japan and Singapore, countries located in the Eastern Asia and South-eastern Asia subregion, respectively, top the rankings of countries with the lowest homicide rates in the world. Nevertheless, the Central Asia subregion has pulled regional homicide rates even lower in recent decades by reducing its homicide rates from 7.9 to 1.98 per 100,000, a reduction of nearly 75 percent over the 2000-2019 period ([United Nations Office for Drugs and Crime, 2019](#)). For its part, South-eastern Asia saw homicides fluctuate in the range between 3.23 and 2.46 in the 2000- 2016 period. Since then, homicide rates in the subregion have been falling to a plateau of 1.7 homicides per 100,000 population in 2019. Southern Asia has also experienced a 23% reduction in homicides per 100,000 population, mainly reflecting declining homicide rates in India and Pakistan, the two most populous countries in the sub-region. While homicide rates have been trending downward in nearly almost Asia's subregions, Western Asia has been an exception. Comprised of countries such as Yemen, the Syrian Arab Republic, and Iraq, the

subregion saw its homicide rates rise in 2019 to 4.69% per 100,00 population, an increase of 25% over 2010.

Figure 2.5: Homicide rate estimates for Asian sub-regions, 2000-2019

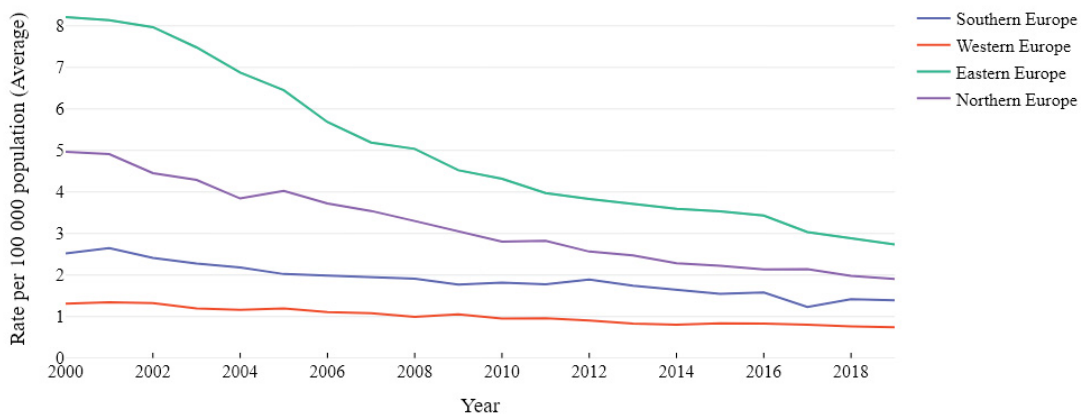


Elaborated by the author with data from the United Nations Office on Drugs and Crime.

2.4 Europe

In Europe, until about 2002, homicide rates fluctuated along an upward trend of about 8.16 homicides per 100,000 population; then, in 2019, it dropped by more than 68% to reach a rate of only 2.5 homicides per 100,000 (Figure 2.6).

Figure 2.6: Homicide rate estimates for European sub-regions, 2000-2019



Elaborated by the author with data from the United Nations Office on Drugs and Crime.

The dynamics in homicide rates on the European continent mainly reflect the trajectory seen in the Eastern Europe subregion (which includes Russia, Ukraine, and

others), a subregion with the highest number of homicides per 100,000 yet, which saw its homicide rates decline from 17.28 to 4.95 homicides per 100,000 population over the period 2002-2019. Southern Europe, the subregion with the lowest homicide rate on the continent over the past two decades, saw its rates reduce further over the period, to 0.71 per 100,000 population in 2019, a 54% reduction from 2001 figures. After a 33% decrease from 2002 to 2015, in 2016, the Western European subregion experienced a slight increase in its rates, accompanied by a further decrease in the following period, leading the subregion to an average of 1.15 homicides per 100,000 population in 2019. Northern Europe also experienced a reduction in homicide rates of nearly 50% from 2002 to 2014, followed by an upward fluctuation between 2015 and 2017 and a period of stability that kept the rates at 1.24 homicides per 100,000 population in 2019.

3 Correlates for Lethal Violence

This chapter examines the correlates between homicide rates and a wide range of socioeconomic factors. These include deprivation conditions, development indicators, and demographic characteristics.

3.1 Economic Deprivation

Homicide research conceives of economic deprivation in terms of relative deprivation and absolute deprivation. Relative deprivation refers to income inequality in a territory and is usually operationalized using the Gini index or income ratios. Absolute deprivation is a concept that refers to the condition faced by the portion of the population that is unable to meet its essential needs and is typically operationalized using poverty rates, consumption-based measures, or proxies such as the infant mortality rate.

A diversity of theoretical perspectives has guided studies on the relationship between economic deprivation and lethal violence. The main one, based on the strain theory tradition, considers economic deprivation a condition that can stimulate negative feelings of hostility, stress, and frustration stemming from blocked opportunities (Agnew, 2016; Blau & Blau, 1982). The condition of relative deprivation perceived by individuals would exert an intense pressure to commit crimes since, in contexts of high inequality, people compare themselves to advantaged others and decide that they deserve what these others have. However, they perceive the impossibility of obtaining what these others have through legitimate means. In an anomic world where the overvaluation of monetary success coexists with the lack of economic opportunities, the impossibility of achieving high-valued goals legitimately would exert a positive impact on (at least some) individuals' propensity to seek financial success through illegitimate and violent means (Merton, 1938).

Another common analytical approach involving the relation between economic deprivation and homicides is the one provided by social control and disorganization theories. These strains of the research argue that relative and absolute deprivation are important

elements in weakening the legitimacy of institutions such as polity, family, community, and schools that bear the responsibility to promote social rules and normative controls (Shaw & McKay, 1942; Sampson & Byron, 1989). Furthermore, economic deprivation, by inhibiting the integration of individuals into economic and social life, erodes trust and the quality of community living. These factors are relevant because they contribute to socialization breakdowns and create a social climate that increases citizens' likelihood of violent actions (Jacobs & Richardson, 2008). Until recently, the notion that high levels of relative deprivation as expressed by high inequality levels lead to high homicide rates was common wisdom (Fajnzylber et al., 2002; Wilkinson & Pickett, 2010). For instance, (Fajnzylber et al., 2002) uses homicide panel data for a sample of 45 developed and developing countries from 1970 to 1974 and demonstrates that greater income inequality increases lethal violence. But this hypothesis begins to change when some researchers (Pratt & Godsey, 2003; Savolainen, 2000) begin to argue that other factors may condition the effects of inequality on national homicide rates.

For example, in an analysis of 46 countries in the year 2000, (Savolainen, 2000) posits that the criminogenic effects of economic inequality are salient only in societies characterized by low levels of social support. This hypothesis is tested by introducing an interaction term between inequality and social support, as measured by a social security index. The result reveals that those countries that can offer greater social protection appear to reduce the homicidal effects of inequality. This finding offers an important qualification regarding the relationship between inequality and homicides by showing an inconsistency in arguments based purely on the condition of relative deprivation by suggesting that the harmful effects of inequality on violence would be conditioned, for example, by welfare protection systems.

Some studies contend that the inequality-homicide association is not as consistent as previously thought and would need further careful research. For example, (Rogers & Pridemore, 2020) argues about the limitation of the Gini index as a measure of perceived relative deprivation (the theoretical construct often used by the proponents of the strain theory to explain the inequality-homicide association). Instead of using the statistical Gini

coefficient, the author builds upon measures of population-level surveys that capture if a nation's residents perceive it unfair to fit the theoretical construct of perceived inequality better. The authors conducted a multiple linear regression analysis to test the relationship between perceived inequality and homicides. They found that the relationship between inequality and homicides becomes unstable or often disappears.

Other studies argue that when an indicator of absolute deprivation (i.e., poverty) enters the analysis, income inequality loses its significance as a predictor of homicide rates. For example, (Pridemore, 2011) argues that the positive inequality-homicide association may be a product of model misspecification. In particular, the author argues that cross-national studies on the topic have failed to use adequate controls for poverty (such as infant mortality rate and poverty indexes), even though poverty has proved to be an important predictor in analysis at the subnational level and presents an economic explanation similar to those of inequality. Recognizing this issue, (Pridemore, 2011) replicated two previously published studies (Fajnzylber et al., 2002; Savolainen, 2000), in which an association between inequality and homicide was found. In two of the three re-estimated models, the association between inequality and homicide disappears when a proxy for poverty was included in the original model. Nonetheless, a positive and significant poverty-homicide association was held in all cases. Some papers (Pare & Felson, 2014) also provide support to the argument that it may be the condition of absolute deprivation (material poverty) rather than the relative deprivation (inequality) that would be responsible for lethal violence between countries.

3.2 Development

Some authors argue that the problem would be insufficient economic development that increases homicide rates rather than poverty since low levels of development can create an environment in which crime and violence can flourish. In fact, macroanalysis of the correlates of homicides in different societies reveals that, in general, there is a significant link between a country's homicide rate and its level of development (Fajnzylber et al., 2002; Rennó Santos et al., 2022). In general, non-developed countries have higher rates

of homicide than developed countries ([World Health Organization, 2021](#)). Patterns of economic specialization, institutional aspects, and unequal development have led to a widening gap in homicide rates between developed (highly industrialized) countries and non-developed (developing and transitioning) countries.

Economic development variables, measured primarily as GDP or gross national product (GNP) per capita, are indicators typically used in cross-national homicide studies. Regarding the impacts of the GDP on violence, there was a great deal of diversity in the findings. For example, some studies find that economic development is negatively related to homicide rates ([Fajnzylber et al., 2002](#); [Lin, 2007](#); [Rennó Santos et al., 2022](#)). Some theoretical arguments support this assumption. First, economic development can occur alongside expanding social support systems capable of alleviating the difficulties inherent to economic deprivation ([Rogers & Pridemore, 2013](#)). In so doing, it would ease the condition of tension and the challenges faced by a vulnerable part of the population and would reduce the propensity to commit crimes. Second, economic development can occur alongside the improvement of judicial systems with improvements in the legitimacy of institutions, which could guarantee compliance with the laws and, therefore, the reduction of violence ([Ouimet, 2012](#)). Third, assuming that economic development has a more significant impact on the legal sector, a growth in economic activities may reflect an improvement in the availability of job opportunities (or better wages) in the legal compared to the criminal labor market. These points are traditionally discussed in the contexts of strain-disorganization and deprivation theory. They also are explored by the economic theory of crime, which authors such as [Becker \(1968\)](#) first laid out. In his formulation, [Becker \(1968\)](#) considers how different public and private resource allocation strategies interact with offender behavior and how this alters the supply of crimes in society.

On the other hand, the modernization perspective on crime suggests that the association between development and violence would exhibit a non-linear format. Derived from the studies of [Durkheim & Halls \(1984\)](#) regarding the transition from traditional to modern industrial societies, the modernization theory predicts that rates of lethal violence will be higher in those countries that are transitioning between poorly-industrialized

countries and industrialized ones (Clinard & Abbott, 1973; Shelley, 1981). As society grows in complexity and moves from traditional agricultural to modern industrial societies, they experience a series of changes that transform social ties that were once based on familial and religious affinities. Traditional practices assume less importance in social and economic life, exerting less force in sustaining the social order. As a consequence, a significant outbreak of violence is expected. Nevertheless, as specialized industrial activities develop, a new way of sustaining solidarity between individuals grows. This new form of solidarity is no longer based on collective traditions but on the growing division of labor, which, while differentiating individuals from one another, makes them mutually dependent (Durkheim & Halls, 1984). In this way, as specialized activities advance in modern industrial societies, the continuity and cohesion required by the division of labor would be extrapolated to other dimensions of social life. This mutual interdependence would begin to pacify acts of brutal violence in society systematically. In the following chapters, I will expand on Durkheim's contribution to the sociology of violence, elaborating on his concerns about the conditions that have made social peace possible in modern industrialized societies.

Contrary to the arguments that industrialization would reduce violence through its influence on mutual solidarity and improved material conditions is the perspective presented by conflict theory. Conflict theorists argue that the evolving productive structure of industrialized economies would be closely related to the persistence of violence (Taylor et al., 1973; Bohm, 1982). Studies based on conflict explanations see violence as an inevitable trait of the growth of market economies due to poverty, unequal exchange relationships, inequality in access to essential services, and lacking proper wages resulting from this paradoxical development process (Lafree & Tseloni, 2006). This uneven advance of the productive system would encourage feelings of greed and grievances responsible for spreading violence among members of society.

Development generally tends to represent a combination of levels of economic development and societal advances through indicators such as the population's average years of schooling. Several studies have shown that providing people with better levels

of education can discourage violence (Buonanno et al., 2009; Furqan & Mahmood, 2020; Usher et al., 1997). The reasons are diverse. Improvements in school quality and increases in average years of schooling induce teenagers and students to spend more time attending school and decrease the time they would have available to go out and commit juvenile violence and crimes in general (Witte et al., 1994). For most violent crimes, additional years of schooling are likely to increase employability and wages in the legal labor market vis-a-vis illegal market returns, discouraging the latter (Fajnzylber et al., 2002).

Literacy is also a means of imposing heavy opportunity costs in the event of being incarcerated or losing a job for committing violent crimes, which would alter risk preferences (Lochner, 2004). Education for violence reduction goes far beyond the benefits the former has in the labor market outcomes. Improvements in education also have beneficial effects on societal and emotional development. The socialization of young people in a school environment can contain crime-prone behaviors and provide them with a better set of friends (Lochner, 2010). Increasing school graduation can lessen feelings of frustration from blocked opportunities in life. Furthermore, literacy applied to a greater sense of citizenship and knowledge in human affairs can lead people to recognize the dangers of cycles of violence and become responsive to the disservice of violence to the overall social well-being (Pinker, 2011).

On the other hand, higher levels of education can also positively affect violence. Increases in average years of schooling can increase the loot seized through violence and reduce the costs of criminal activity by providing a variety of skills that can be used advantageously in the illegal market. Thus, some authors consider that the effect of schooling on crime rates would initially be ambiguous (Fajnzylber et al., 2002). If, however, it is considered that the legal labor market is more intensive in education and skills than the illegal market, then it is possible to assume that increasing years of schooling could decrease levels of violence.

3.3 Demographics

Some demographic characteristics are believed to promote an environment conducive to violence — for instance, a country's urbanization degree. Cross-national comparative tests of the association between urbanization and homicide rates have shown mixed results. Many studies suggest that urbanization is positively associated with homicide rates, a finding that is consistent with the social disorganization theory (Bennett, 1991; Jacobs & Richardson, 2008). One of the predictions of this approach is that urbanization would be associated with greater social problems and undermining informal controls and normative systems (e.g., family disruption, increased divorce, and greater residential mobility) responsible for containing violent behavior (Pratt & Godsey, 2003). In addition, the high density of people in urban agglomerations is also seen as a facilitator of interactions between criminals and makes the probability of capture lower (Glaeser & Sacerdote, 1999).

Despite this, along with urbanization, a series of positive possibilities can occur, such as job creation and greater access for people to goods and services. In support of this statement, several studies have demonstrated the negative relationship between the proportion of the population living in urban areas and homicides, suggesting that as societies modernize, violent crime declines (Antonaccio & Tittle, 2007; Fajnzylber et al., 2002; Pinker, 2011).

Likewise, the population's age composition is often used to predict homicide rates (Steffensmeier et al., 1989; Steffensmeier et al., 2017; Phillips, 2016). A high proportion of the young population (people aged 15 to 29) can increase homicide rates through two distinct theoretical mechanisms. The first one involves a compositional effect of the age-homicides relationship from the individual to the aggregate level, especially for young men (Phillips, 2016). As young men are said to be individually more prone to violence, an increase in young males should increase the incidence of potential offenders. In addition to being the main offenders, young men are also the main victims of lethal violence (UNODC, 2019). Thus, all else equal, societies with a higher proportion of young men should have higher homicide rates.

Second, the relative size of the youth cohort compared to the rest of the population puts pressure on the labor market, which cannot absorb new entrants. The oversupply of labor increases competition for opportunities in the formal market among young people, which lowers wages and can encourage the search for income through illegitimate means (Easterlin, 1978). In addition, the relatively large size of the youth cohort reduces the number of adults available in the community to mentor and support youth who, in turn, will spend more time with individuals from the same cohort as their (Osgood & Anderson, 2006). Peer influence added to the absence of adult supervision in an environment that already harbors frustrations due to diminished opportunities in the formal labor market can raise homicide rates.

While existing studies show a preference for inequality, income, and lack of education as determinants of lethal violence, they assume these determinants to be essentially self-generated. This means that studies often operate on these correlates without any reference to the underlying political and economic forces that may have produced them. Although these are all valid predictors of homicide, they do not address the problem at its roots.

4 Historical Nexus Between Violence, Institutions, and Economic Structure

This chapter portrays violence throughout history to highlight institutions and economic structure as the roots of contemporary violence. The purpose is to move beyond understandings that look at violence as unique to contemporary times, instead presenting the issue as a historical legacy dating back to both nation-states' creation and the countries' economic formation.

4.1 Europe

4.1.1 Violence and European State Formation

European countries are among the least violent and safest in the world. However, the milieu of murders in the region has not always been so peaceful. According to Ted R. Gurr (1981), a scholar of violence who estimated homicide rates in Europe during the Medieval Ages, homicides were in the order of 20-50 per 100,000 population at that time; today, homicide rates on the Continent as a whole are barely three homicides per 100,000 inhabitants (United Nations Office for Drugs and Crime, 2019). Scholars have interpreted this drastic downturn in homicides as an expression of a declining secular trajectory in violence stemming from changes in the state's nature in the sixteenth and seventeenth centuries.

The work of sociologist Norbert Elias (2000 [1939]) forms one of the main theoretical frameworks used by those scholars who want to investigate the origins of the long trajectory of declining homicide rates in Europe. Elias' theoretical approach, presented in his influential work *The Civilizing Process* (2000 [1939]), addresses long-term dynamics in both political and social spheres, as well as changes in psychic traits of individuals, which together were responsible for gradually transforming the landscape of violence in Europe. For Elias, the most crucial cause of the secular decline of murders in the region was the process of state formation and the centralization of power in the hands of a central government in the Late Middle Ages.

Elias portrayed the Middle Ages as a period where states were weak, and violence was widespread due to the decentralization of territories into small provinces where everyone warred with each other to maintain and extend power. A few centuries later, to gain the monopoly on force, kings took away from feudal lords their prerogatives to rule and fight at the local level, exchanging local power for a seat inside the king's court. Elias highlights how this transition from knightly warrior societies to a relatively peaceful coexistence in the royal court led the nobility to lose their bellicose functions, starting a historical process of declining murder patterns in Europe. Although initially restricted to court nobles, the pacification of violence gradually began to spread to other groups and strata of medieval society. The relative pacification of everyday interactions allowed the emergence of complex relationships among individuals that privileged growing social understanding over brutal force as an essential trait (Eisner, 2001). Therefore, internal violence ceased to be the primary means of advancing objectives, enabling the raising of improved social relationships in the conduction of social life.

Relying on the growing strength of the state, a nascent rule of law began to arise. While acknowledging a more significant number of fundamental rights for people, establishing laws for citizens and rulers safeguarded that a centralized state would not become a dictatorial regime (Kleinfeld, 2018). As institutions that guaranteed the state's monopoly on legitimate violence became more stable, the state could offer more protection, and people became less inclined to use violence to protect themselves and less willing to accept explicit demonstrations of violence from fellow citizens (Kleinfeld, 2018). Over time, state and society gradually civilized together.

Many cases support Elias' civilizing theory in explaining the early history of homicides. For instance, the estimates of homicide rates provided by Gurr (1981), who first described the long-term trends for European homicides. Overlaying evidence from a series of historical studies for Medieval England, Gurr finds an estimate of 20 to 50 homicides per 100,000 population in the Late Middle Ages, disclosing, according to the author, "a portrait of a society in which men (but rarely women) were easily provoked to violent anger and were unrestrained in the brutality with which they attacked their

opponents” (Gurr, 1981: 307). Murders were a recurrent fact of the daily life of English people until the 17th century, when a long-term decline in bloodshed settled in. The decline was such that homicide rates were less than 1 per 100,000 in the late 18th. Gurr interpreted this declining trend as a result of the monopolization of the power of violence deployed by the nascent European states, which contributed to centralizing the prerogative of the legitimate exercise of violence under the aegis of the state, further changing social values and bringing about a greater “sensitization to violence” within society (Gurr, 1981: 343).

In an attempt to integrate the knowledge accumulated since (Gurr, 1981) work on long-term trends in homicides, criminologist Manuel Eisner (2001) followed the homicide rates of several European countries for more than 800 years. His research demonstrates that the secular decline of Europe’s homicide rates began at the dawn of the formation of modern nation-states in the early seventeenth century. In these states, the acquisition of the monopoly of legitimate violence altered social norms, making internal violence increasingly unacceptable.

Although Eisner (2001) findings support the theoretical model proposed by Elias (2000 [1939]), the author stresses that the pacification dynamics of violence in Europe were not sustained exclusively by the consent of the state’s monopoly on violence. According to the author, the reduction in homicide rates was also a manifestation of complex interactions involving different forces of both socio-political and economic nature (Eisner, 2001). New arrangements in the economic structure, such as the organization of labor in manufactures and the progressive modernization of society, contributed to forming a new social order that would further favor the decline of murders across Europe.

4.1.2 Violence and the Growing Division of Labor in European Society

The consolidation of state power was only one of the forces that influenced the declining trajectory of murders in Europe. The reduction is also attributed to industrial modernization, a process by which countries move from being primarily agricultural to industrial societies. The modernization perspective applied to the study of homicides can be directly

associated with the sociologist Emile Durkheim's insights regarding the transition from traditional to modern societies. According to Durkheim's perspective, the transition to modern societies occurs when a complex division of labor brings about an increasing differentiation among individuals, transforming social bonds that for millennia had been anchored in kinship and religious similarities into a new type of solidarity primarily based on differences. In his influential work *The Division of Labor in Society* (1984 [1893]), Durkheim finds a role for the division of labor that goes beyond the purely economic advantages it presents. The author does not limit his analysis to seeing the division of labor only as a necessary condition for increasing societies' productive force and material development. In Durkheim's sociological theory, the division of labor has the social function of increasing cohesion among the members of society, constituting one of the fundamental sources of solidarity and respect for human lives (Durkheim & Halls, 1984 [1893]).

From the simplest to contemporary, all known societies presented some degree of division of labor that could characterize them (Coser, 1984). So it was with medieval societies. As early as in the Middle Ages, one could observe clear distinctions between people who devoted themselves to the obligations of rural life and those who attended a religious call. There was social recognition of all workers for their different professional roles, from bakers to butchers to shoemakers. However, despite some diversification in economic tasks, the division of labor in pre-industrial societies was still characterized by relative simplicity since differentiation among workers mainly involved a division between rural and urban craftsmen (Coser, 1984). Breakthroughs in the complexity of the division of labor only occurred with the Industrial Revolution at the end of the eighteenth century, which introduced an economic system that profoundly changed the differentiation in allocating productive and social tasks. The industrial system was characterized by the replacement of craft labor in which a single artisan or a small group of them was responsible for manufacturing a product from the beginning to the end, by a new mode of production in which there is a higher sophistication in the division of labor functions. In the emerging industrial process, the final product would result from the cooperation of many workers who perform different but complementary tasks. The integrated work of many specialized

workers is now capable of producing a greater quantity of products than any single worker would have been able to produce in the former mode of production (Coser, 1984).

We can understand Durkheim's central contribution to the sociology of violence, elaborating on his concerns about the nature and conditions that have made social cohesion possible in complex and differentiated societies. A basic understanding of this general pattern is necessary to link Durkheim's insights on societal development with homicides. Durkheim's sociological theory is rooted primarily in his account of the growth of social organization due to the emergence of the industrial division of labor. In the *Division of Labor* (1984 [1893]), Durkheim argues that, as a society grows in complexity, social bonds derived from the division of labor have become much more numerous than those derived from consanguinity and shared beliefs. The question posed by Durkheim that is of great importance for the present study is the following: if social solidarity in pre-industrial societies was sustained by kinship and similarities in traditions, what has supported solidarity in modern industrial societies since the new way of organizing production had made individuals so different from each other? Perhaps, we may rephrase Durkheim's fundamental question as follows: if family, religion, and traditional practices that used to bind people together assume less and less importance in social life due to the ever-increasing division of labor, how is it possible that complex societies have managed to sustain solidarity among individuals without escalating into generalized violence and social disorder despite the profound transformations they have undergone?

To answer these questions, we should follow Durkheim's distinction between the type of solidarity existing in pre-industrial societies from that of modern industrial societies. Durkheim called the former mechanical solidarity and the latter organic solidarity. Mechanical solidarity is present in a society's common beliefs and practices, and its action could be felt mainly through the affinities that family and religious traditions generate. The collective consciousness, as Durkheim named this set of social similarities, is responsible for producing a type of social cohesion that binds individuals to society through conformity. On the other hand, the solidarity arising from the division of labor or organic solidarity is entirely something else. Organic solidarity does not require similarities that move

toward conformity as in the previous case. Whereas the former supposes similarities unite individuals, this one supposes that they differ from each other (Durkheim & Halls, 1984 [1893]). Integration derived from organic solidarity implies that the more divided the work and the more specialized the tasks, the more the individual types develop and start having their movements simultaneously as each person becomes more and more dependent on each other.

Durkheim argues that as specialized activities develop, social bonds derived from similarities gradually decrease, exerting less force in sustaining solidarity among individuals. It follows that the consciousness of collective traditions “has become weaker and vaguer” such that “we can rest assured that a weakening in this solidarity has occurred” (Durkheim & Halls, 1984 [1893]: 196). If mechanical solidarity and its bonds based on similarities have weakened due to the increasing division of labor, the upheavals that may take place cannot be so completely pacified by the social body since common beliefs and practices would no longer have the same force to keep the individual connected to the group (Durkheim & Halls, 1984 [1893]). No longer having the same counterweight, violent tendencies would manifest more easily, and we could expect a dissolution of social life and an escalation of violence.

From Durkheim’s insightful perspectives, we may boldly hypothesize that in societies whose cohesion is produced by the division of labor, i.e., where organic solidarity becomes predominant, the horror of destructive violence acquires greater gravity. As the interdependence between individuals acquires more significance in maintaining social and economic life, episodes of violence that cease human lives affect societies in its most vital part by discontinuing social bonds. Therefore, the solidarity that emerges from the division of labor can have an influence that contains and pacifies the brutal acts of violence since, in Durkheim’s words, “each of the productive and social functions that people perform is constantly dependent on the others and forms with them a solidary system” (Durkheim & Halls, 1984 [1893]: 217).

For Durkheim, the state of mutual dependence in which people find themselves in the modern division of labor would open space for the manifestation of sentiments centered

on sympathy for humankind and the protection of human dignity. For him, people begin to “carry on the worship of the dignity of the human person” (Durkheim & Halls, 1984 [1893]: 122). Since specialized activities require continuity, lives cannot be violently interrupted without damage of all kinds. As a result of their interdependence, what hits one hits the others, and thus severe episodes of violence acquire a general interest. Recognizing this mutual interdependence among humans laid the foundations for the first movements of what some historians will call the Humanitarian Revolution in the seventeenth century (Pinker, 2011). Back then, humane laws and principles were systematically developed to abolish socially accepted forms of violence, such as torture and rape.

4.1.2.1 Empirical Evidence of Durkheim’s Perspective on Homicides

There has been an effort to employ Durkheim’s assessments on social change more directly in explaining homicides, making modernization theory an important explanation for understanding cross-national variation in homicide rates. For example, Eisner (2001) provides evidence of a negative association between the early homicides and the complex division of labor that emerged with the industrial revolution in the late 18th century. The author shows that the secular decline in homicide rates began first in England and the Netherlands, countries that had pioneered the process of industrial modernization, later spreading to other countries on the Continent. Further highlighting a negative relationship between the process of industrial modernization and homicides, the evidence found by Bonger (1916) indicates that high homicide levels were associated with locations with low industrialization across the European Continent in the late nineteenth century. On the other hand, Shaw & McKay (1942) linked the first stages of the industrial process to increased rates of homicide. In implementing Durkheim’s distinction to understand upward trends of homicide at the beginning of the modernization process, we can relate the weakening of the collective consciousness in the first stages of the division of labor with the disruption of many well-established rules and traditions that used to restrain violence. If no new bonds replace the preceding traditional ones, an increase in homicides

seems to be an inevitable consequence of structural changes (Messner, 1982; Messner & Rosenfeld, 2001).

However, as presented above, Durkheim's central argument demonstrates how a new kind of solidarity begins to fill the space once occupied by the common consciousness. The emergence of the division of labor and its new organizational forces led to a form of social organization that connects people in an even more effective way (Lee & Bankston, 1999). Therefore, the stresses of the initial phases of disorder due to rapid industrialization and the initial tendency toward increased homicides are more than offset by the modern organic division of labor. As the division of labor advances in societies and becomes increasingly complex, people perform increasingly diverse productive functions and social roles, developing values and interests that do not always conform (Messner, 1982). However, despite intense differentiation, people increasingly depend more closely on each other for survival.

The modernization literature on violence indeed indicates that while increases in homicides may characterize the early stages of industrialization, the long-term trend is toward reduced homicide rates (Gurr, 1981; LaFree et al., 2015; Shelley, 1981), suggesting that the long-term relationship between the increasing complexity of societies and homicide rates may be curvilinear. Previous research has attempted to conceptualize the division of labor in terms of occupational or industrial heterogeneity measures (Krohn, 1978; Messner, 1986). Others have attempted to test the industrial modernization perspective through measures of development, most often Gross National Product (GNP) or Gross Domestic Product (GDP) ((Bennett, 1991), (Neapolitan, 1996)). In Chapter 6, I suggest using a new measure for the complex division of labor in societies.

In Durkheim's formulation, we have noted that the division of labor is not limited to simple material uses since the author presented the issue as one of the fundamental basis of solidarity among individuals. By constituting one of the foundations of social cohesion, the industrial division of labor could exercise a moderating action on the diffusion of violence in societies while determining the constitutive characteristics of their economic structure.

Although Durkheim provides a highly original approach to linking the division of labor and homicides, we should note a major flaw in his argumentation. Durkheim fails to systematically assume the conflicts inherent in the division of labor and see how powerful groups of society can distort the meaning of solidarity to dominate and exclude others from participating in and benefiting from it (Lukes, 2014). As criminologist David Garland writes when evaluating the extent of human sympathy in modern complex societies: "That group solidarity can co-exist with social division. Inclusion with exclusion, is a feature of social organization about which Durkheim has little to say" (Garland, 2012: 30).

This apparent paradox that Garland refers to occurs internally in societies. It can also historically be noted in relations across countries, notably when we see in Europe the declining trajectory of internal violence co-existing with increases in the oppression of other people. The European civilizing process and the pacifying action of the emerging division of labor were selective and directed inward, as the weapons that ceased to be aimed at local citizens began to be directed outward.

4.2 Americas: Giving Up the Monopoly on Violence

Whereas on behalf of the interests of civility, internal violence was being removed from European countries and moving away from its citizens, bloodshed was exported to the inhabitants of America, Africa, and Asia in the form of colonialism and slavery, establishing a permanent state of violence in colonized countries. Forcibly submitted and assimilated by European colonial regimes, indigenous and enslaved people were objectified as a labor force and had their human dignity reduced to ashes. Economic interests imposed the contours of violence in the United States and Brazil, America's two largest slave colonies (Ferraro, 2021). Slave violence advanced in response to the rhythms of their respective world market commodities and the particular political incentives of each country. At the dawn of nation-states, the formation of these countries was legally intertwined with violence. In both countries, institutions abdicated the monopoly of the legitimate use of violence on behalf of private interests and economic growth.

4.2.1 United States

Many violence scholars in the United States and worldwide have focused on why the country, one of the world's most prosperous societies, has had systematically higher homicide rates than any other developed nation. The explanation traces back to the country's economic formation and its closer relationship with violence.

Violence at the heart of slavery was one of the keys to the economic productivity of the United States in the 18th and 19th centuries. The North American production system of the period was based on cotton plantations, whose production had become highly profitable in the wake of the reconfiguration of markets by the Industrial Revolution. Providing 62% of the entire world's supply in 1841 (Ferraro, 2021), the United States cotton kingdom prevailed due to the landowner's ability to fulfill the external demand at a very low cost through the adoption of a violent work regime on enslaved people. Forcibly brought from Africa or born into captivity, 2.7 million enslaved people had their lives intertwined with the influxes of the cotton trade in the 1850s (Parron, 2015).

Slavery was a viable enterprise only for the large landowners of the plantations of the so-called Old South of the United States, where it was possible to specialize the productive structure in a large-scale exportable good able to remunerate a vast amount of capital investments. The high profitability of the cotton plantations extracted at the cost of violence on enslaved bodies transformed the South into a bloody granary highly dependent on the external influxes of a single commodity (Ferraro, 2021). Slave ownership became a privilege of the agricultural classes in the South, and, in general, it was not affordable for the small landowners in the North of the country (Furtado, 2007 [1958]). In contrast to the large slave farms of the South, the Northern agricultural units were composed mainly of European settlers' families distributed into small properties. The North became a case of relatively low productivity and, thus, lower profitability since there was no need to remunerate large amounts of capital. Thus, a large-scale slavery enterprise became practically unfeasible (Furtado, 2007 [1958]). Despite (and because) of that, Northern producers were able to diversify their crops and stimulate the production of other manufactured goods, later constituting the main source of supply for the prosperous

sugar colonies of the South. The development of a diversified productive structure not specialized in the export of agricultural commodities marked the emergence of a commercial economy in the Northern United States that favored wage labor rather than the violence of intense exploitation of slave workers as a means to achieve development.

These contrasting characteristics in the productive structure unfolded into significant divergences of interests between the dominant classes of the North and South of the United States (Furtado, 2007 [1958]). In the Southern slave-owning productive units, the landlords were closely aligned with the interests of powerful European financial groups, inclining them to consider these productive units as mere commodity suppliers for international demand without any affinity of interests with the local population. In opposition, the interests in the North were directed mainly by locally concentrated commercial groups, which were often in significant conflict with Southern slave lords concerning the necessary means to fulfill the demands of the world market (Furtado, 2007 [1958]). The separation of the interests of the two main parts of the system compromised the economic and political solidarity that sustained slavery in the North American Continent. From the 18th century onwards, the abolitionist movement gained momentum in the United States, and the slaveholding class in the South began to fight with Northern abolitionists for the maintenance of slavery (Ferraro, 2021).

In 1776, the United States instituted a representative regime in the country. Without mentioning the word slavery, the US Constitution was established, silently recognizing violence as an intrinsic part of state formation (Ferraro, 2021). In the Liberty Era, the horror of slavery was not qualified as a crime as state intervention in slavery would threaten the heart of the prevailing system of production (Ferraro, 2021). By giving up its power to intervene in the brutal slavery, the US state intentionally chose to share the control of the legitimate means of violence with slave-owning classes, giving them almost unlimited powers to command domestic order through violence against enslaved people. The use of brutal violence, rather than being swept away in the process of state formation as it was for most European countries, became deliberately institutionalized in the United States of America.

In fact, Americans never completely ceded the monopoly of legitimate violence to the government. After the War of Independence, the state could not offer substantial incentives to encourage the population to disarm. Since the newly formed state could not guarantee the protection of all its citizens, especially those on the frontier, the Second Amendment to the Constitution legally instituted the right to bear arms in the country¹. As [Kleinfeld \(2018\)](#) states, this formal declaration of the government giving up its monopoly on violence “was the product of a government too weak to protect its people and too democratic to take away their right to protect themselves” ([Kleinfeld, 2018: 78](#)). Once again, the United States chose to share the legitimate use of violence; this time, among its citizens. That brought us to the most homicidal developed nation in the world.

4.2.2 Brazil

As in many other colonized nations, Brazil’s economic formation reciprocally required monoculture, slavery, and violence. With the oppressive conquest of the Portuguese Europeans, Brazil was organized as a large agricultural granary specialized in producing tropical products for export. The colonial occupation of the 16th century was fundamentally linked to the sugar industry, and, as the land was a large factor in the country, the most significant difficulty in this first stage of economic occupation was the lack of labor force on the scale required by the large sugar mills ([Furtado, 2007 \[1958\]](#)). Since the exploitation of the indigenous native proved to be unfeasible on the required scale, the enslavement of black Africans became the backbone of the sugar economy. This system based its success on the human costs that fell on hundreds of thousands of black people violently brought from Africa or born into captivity and forced to migrate to the plantations. The enslavement of black people proved to be an efficient way of allocating scarce resources compared to other labor regimes. The farmers’ relationship with their slaves has none of the solidarity that Durkheim claimed the division of labor is capable of producing.

¹The Second Amendment to the United States Constitution declares: “A well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear Arms, shall not be infringed.”

On the contrary, slavery labor relations are a one-sided relationship. In the free labor regime, there is a commute between the worker who offers his labor in exchange for remuneration. On the other hand, the slave labor regime has no counterpart from the landowner. Therefore, the administration of threats and physical and psychological violence against the slave becomes a fundamental factor for extracting labor and maintaining this unbalanced relationship (Parron, 2009).

Paradoxically, the violence of slavery was further intensified in Brazil in the context of the creation of the modern national state in the 19th century, under the justification of economic growth (Ferraro, 2021). Had the country's independence not been a rebellion of the ruling elites, emancipation might have been a relief from the violence against the enslaved people. However, the central government was too submitted to the interests of the regional agricultural classes to respond with the necessary promptness and efficiency to the abolitionist winds coming from the Northern countries. In fact, the expansion and maintenance of slavery in Brazil gained renewed momentum in the 19th century because of the coffee economy's growth in the country's southeast. In the fifteen years between 1835 and 1850, the intensification of smuggling of black Africans reached staggering levels, on the order of 700,000 people violently brought into the country (Parron, 2009).

In this period, the tendency of institutions to subordinate to the interests of an economic group was accentuated with the rise of the coffee class, allowing a complete integration of the interests of the dominant agricultural groups and the Brazilian political-bureaucratic frameworks (Furtado, 2007 [1958]). The coffee farmers used this control to achieve perfectly defined goals of a slave-owning agricultural policy that legitimized violence against enslaved people as a way to advance their economic objectives. The Brazilian state partially shared the monopoly of legitimate violence with the agricultural elites, unable to fully coordinate the path to social order and justice in the country. Violence became a natural means of achievement and control for these dominant classes and the state. In this way, the violence that surrounded slavery was not only necessary as a means of organizing production but also because it was the basis of a regional system of power (Ferraro, 2021; Parron, 2009). In this context, the state's complicity concerning violence

in favor of the dominant agricultural groups is an essential sustaining component of a productive structure that has its bases rooted in violence. In other words, the economic structure based on monoculture and the slave labor regime sanctioned by the state shaped a historical trajectory that made the perpetuation of violence possible over time.

Slavery in Brazil prevailed as one of the last to be abolished, sustaining the system until 1888. The formerly enslaved people had restricted political rights and were subjected to marginalization in all spheres of Brazilian society. For the freed black women and men and their descendants, the sense of equality and expectation of rights even under the rule of law was always fragile (Chevigny, 1995), which means that the Brazilian state has never been able to offer protection to all citizens equally. Consequently, the reasons for society to cede the monopoly of the use of violence to the government have been similarly weak. Based on a history of violence and subjugation, citizens never had confidence that the government would be able to protect them, and people ended up resorting to violence or violent self-help to protect themselves.

This chapter portrayed a brief historical understanding of violence by drawing attention to the link between violence, state formation, and economic structure. By defamiliarizing our typical perceptions of violence, we are called to confront the factors that effectively contributed to making violence a salient feature of the American Continent. The violence of slavery that sustained the plantations and the submission of the state to the interests of the regional agricultural classes contributed to the general stability of a system responsible for systematizing violence in both hemispheres of the Continent. Unlike most European countries, in the US, as in Brazil, the state never had a monopoly on using legitimate violence, deliberately sharing it with interest groups throughout their history. Although the colonial era systems have undergone modifications, their general structure has been preserved over the centuries by adapted contemporary institutions and economic structures that continue to reproduce modified forms of violence until today.

5 Contemporary Nexus Between Violence, Institutions, and Economic Structure

5.1 Institutions' Contribution to Violence

Since modern states arose as political entities in the early seventeenth century, their function in building order and reducing violence has rested on their capability to enforce agreements through the control of the legitimate means of violence (Hobbes, 2014 [1651]). Whereas scholars may differ in the extent to which they view the state as either coercive or a security enhancer, they all agree that institutions are essential for maintaining stability and peace.

Institutions are the socially embedded rules, formal and informal, that govern societies (North, 1990). Formal institutions are those written regulations established by official authorities, such as laws, the civil code, and policies of duties and obligations. On the other hand, informal institutions often outline unwritten norms of behavior and thought, such as schools, religious congregations, and the family. Institutions have the power to shape, limit, and direct possible social actions regarding what is right or wrong; therefore, they are significant players in structuring human behavior - including those related to violence. For example, formal institutions of a political nature that, by making and enforcing laws and using their power to reward some actions and punish others, can make societies more or less violent by establishing opportunities and limits for possible violent actions by individuals and groups. When they have legitimacy, institutions can be an essential source of solutions to social problems because people comply with them voluntarily.

These studies have drawn primarily on research developed in political economy and institutional economics (Acemoglu & Robinson, 2012; Kleinfeld, 2018), which highlight how poor governance has important implications for a country's social and economic outcomes. Research examining institutions has shown how issues related to the types of government, legitimacy, stability, and institutional effectiveness build a framework that

can have far-reaching implications for society (Bannon & Collier, 2003). These results have suggested introducing institutional factors in models that analyze variations in violence rates. Nonetheless, empirical findings on the relationship between institutions and homicide rates are relatively recent in the cross-national literature on homicide rates.

For example, Chainey et al. (2021) demonstrate that the ineffectiveness of institutions in providing security for citizens can influence homicide rates by creating a space where violent acts may spread. The authors' analysis also suggested that controlling corruption can influence violence. Corruption plays an influential role in homicides because it undermines the legitimacy of institutions and the judicial system, which opens space for potential offenders to believe that brutal acts of violence will go unpunished. Antonaccio & Tittle (2007) also found that countries that fail to control corruption are more likely to experience high homicide rates. On the other hand, de Soysa (2021) finds no evidence to support that democratic participation and access to justice could reduce homicide rates across countries. The results show that the resilience of violence under consolidating democratic systems is a reality in various countries.

Although some studies assume institutions can shape violence, past research has discounted or even ignored the effects state actors' relations with criminals may have on cross-national variation in homicides. Often, the literature considers states weak and unable to fight effectively to secure peace and prevent violence from spilling over. This weak-state perspective views governments as unable to protect their citizens and consolidate legitimacy by enforcing the rule of law (Kleinfeld, 2018). Under this perspective, reducing violence would be primarily subject to supporting institutions in improving their effectiveness (Chainey et al., 2021), raising funds for institutional strengthening, and implementing anti-violence programs, such as special training for security agents and a more significant presence of security forces on the streets. However, the weak-states perspective overlooks that capacity-building programs and other efforts to contain violence can only be effective when institutions are committed to reducing violence.

Another strain of research has suggested that examining state institutions' links with criminals is crucial to understanding the persistence of violence in violent countries

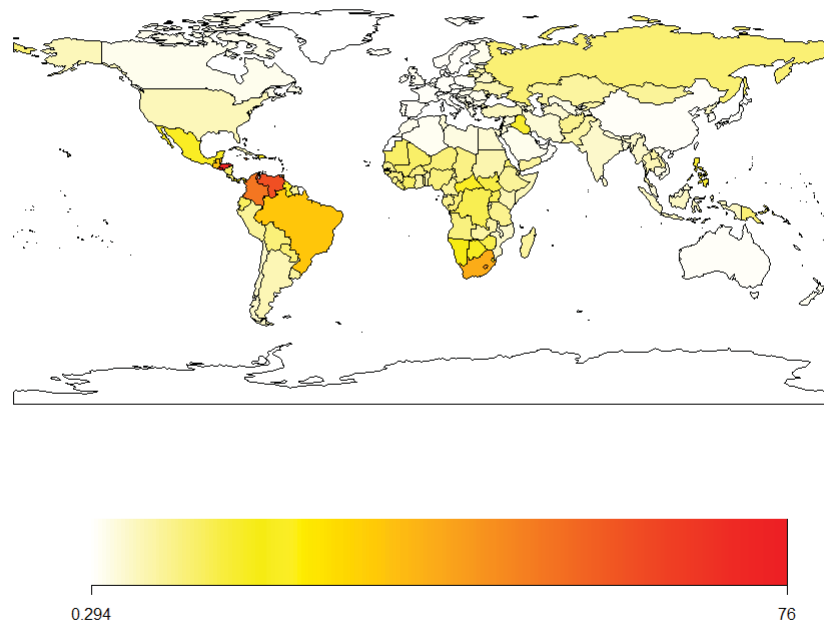
(Hristov; 2014; Kleinfeld, 2018; Moncada, 2013). Through complicit relations with criminals, actors operating inside the state protect their privileged positions and use these symbiotic relations to build political and economic power that may be unattainable without the skilled use of violence. The "complicit state perspective," in opposition to the weak state's perspective, claim that, often, extreme violence is not a matter of institutional weakness but a lack of collective commitment, as many local governments and privileged groups benefit from violence.

To contrast these two types of institutional dysfunction, let us take Brazil and Syria as examples. These two countries share extreme levels of violence as a fundamental problem while being on the opposite institutional spectrum. According to the World Health Organization, Brazil had 67,937 murders in 2016, a year in which the Syrian Observatory for Human Rights documented 52,589 violent deaths. Although both states suffer from a severe institutional dysfunction, as both have been unable to protect their citizens, this dysfunction is of an entirely different nature between them. The violence in Syria is treated as a state failure, as the country does suffer from a lack of essential institutions, especially the state. While Brazil is a democratic functioning state with an extensive bureaucracy; thus, it is not the state's failure that best describes the endemic violence in the country. Instead, Brazil may be witnessing something more dangerous - the emergence of a particular form of state, which Kleinfeld (2018) called Complicit States. Complicit states share the monopoly of the means of violence to protect privileges and maintain control over society. Complicit States allow violence to spread, sometimes fighting and sometimes giving way to criminal groups.

Delving into the perspective on how complicit states work, consider a map of countries affected by high homicide rates, as shown in Figure 5.1. The image shows the homicide rates worldwide using data on countries from the World Health Organization, described in further detail below in the Data and Methods chapter. Perhaps a handful of these countries can be characterized as weak states where institutions barely function. However, for several other countries, the answer is not this simple. In 2019, the most violent countries in the world, in absolute terms, were Brazil, India, Mexico, South Africa,

Colombia, the United States of America, Nigeria, Venezuela, the Philippines, and Pakistan. Adjusting for population, the list of countries with high homicide rates changes to El Salvador at the top, followed by Honduras, Venezuela, Jamaica, Lesotho, Trinidad and Tobago, Colombia, the Bahamas, Belize, and South Africa.

Figure 5.1: Homicide rates per 100,000 population, annual average from 2009 to 2019



Source: Elaborated by the author with data from the World Health Organization.

Why is the lack of state monopoly over the means of violence not a case of weakness in these countries? First, state failure does not convey the characteristics of many countries on this list. Many of them are middle-income countries, and among them are countries with the highest GDP per capita in their regions, such as Brazil and South Africa. Indeed, the list of the most homicidal countries in 2019 even contains one of the wealthiest countries in the world, the United States. Second, many of these countries can reasonably prosecute conflicts and crimes within the scope of justice, despite witnessing

the systematization of violence in its multiple forms and different social segments for so long.

Some violence scholars argue that there is a relevant institutional device behind all this brutality. According to [Hristov \(2014\)](#), in these countries, the state does not build its legitimacy based on acquiring a monopoly over the means of violence but on the lack of it. These states have never aspired to hold a monopoly on violence. They use the sources of disorder, such as youth and gangs, to justify the imposition of a savage order that seeks the reassertion of authority based on violence ([De Lima, 2018](#); [Hristov, 2014](#)).

In such complicit states, a reciprocal relationship between the state actors and illegal armed groups is very usual ([Acemoglu et al., 2013](#); [Pearce, 2010](#)). For the purposes of this work, state actors include elected politicians, public officials, bureaucrats, and the police. Part of the actors that work within the state mixes with criminal forces to shape the political environment in their favor in return for money and arms ([Pearce, 2010](#)). For example, the paramilitary groups in Colombia, illegal private armed groups created and financed by wealthy sectors of society, which receive unofficial financing and armed support from the state ([Hristov, 2014](#)). The development of the paramilitary groups has involved the active participation of the country's economic elite, with landowners, cattle and agribusinessmen, and narco-traffickers in their leadership ([de Jesús Velásquez Rivera, 2007](#)). Paramilitary violence is directed mainly at the murder, intimidation, and torture of the civilian population, political and human rights activists, journalists, armed actions against guerrillas, and the forced dispossession of indigenous and peasants living in areas of economic and military interest ([Hristov, 2014](#); [de Jesús Velásquez Rivera, 2007](#)). Political leaders and state security have also benefited from the nexus with paramilitaries, diverting resources to finance these organizations and implicitly offering impunity in criminal cases ([Acemoglu et al., 2013](#)). The alliance between political parties and paramilitaries in Colombia has characterized a so-called Parapolitics in the country, in which politicians and criminals cooperate mutually to hold on to power in the national territory through violent means.

In Brazil, death squads have engaged in extrajudicial killings of young gang members and other residents of poor communities ([Amnesty International, 2009](#)). They emerged with the reorganization of political powers after the country's re-democratization and are formed mainly by state security agents, including police and military ([Cruz, 2016](#)). In a 2009 report, Amnesty International draws attention to the fact that "In the state of Pernambuco, 70% of all homicides in 2008 were attributed to death squads or so-called extermination groups composed of state agents, particularly the police" ([Amnesty International, 2009](#)). Paramilitary-like formations are not limited to Latin America. Paramilitary groups and militias have also conducted social cleansing and violent deaths in Central America, the Middle East, and Africa ([World Bank, 2011](#)).

Often, state security discourses revolve around gang violence and disputes between criminal factions. While these actors' responsibility for the proliferation of violence is undeniable, it does not properly explain the forces supporting those violent groups. The standard security debate usually fails to explicitly consider violence that originates in the state's collusion with organized criminal activities. For instance, in Venezuela, the head of state was prosecuted for narco-terrorism and drug smuggling ([Berwick & Spetalnick, 2020](#); [Rashbaum et al., 2020](#)). In 2019, a Brazilian military airplane was caught by Spanish police trying to enter with 39 kg of cocaine in Seville ([Khalip, 2019](#)). The cases show that, in some countries, part of the government and a portion of its members supposed to protect society are feeding violence. Prominent state members involved in the perpetration of crimes can shape state policies and decision-making practices and are unlikely to implement even the most tested technical solutions to solve violence problems.

Violence from private armed groups, criminal factions, and state forces accounts for only part of the deaths witnessed in these societies. Ordinary people also perpetrate another portion of the brutality. When people lose confidence in their rulers and this distrust deepens, citizens lose their inhibitions about being violent. Some of these people also protect their interests and survival, joining violent groups and supporting their actions, which characterizes a social decivilizing process ([Kleinfeld, 2018](#)).

In complicit states, violence originates in the way the state is governed. Where the government is helping criminals, the state itself is perpetuating violence. These societies often experience high inequality, where economically and politically privileged groups distort the rules in their favor to secure a monopoly on the excessive rents of the state structures. In these states, institutions are not serving public purposes. Instead, the institutions reflect the objectives of different powerful groups and strata with influence and specific interests.

5.2 Economic Structure's Contribution to Violence

Using violence to advance objectives and protect interests is a common practice. States engage in wars supposed to be legitimate to defend their territorial demarcations; self-defense legally justifies violence to preserve life. The prerogative to use violence is the very basis for the conception of the state, understood as the central authority that holds the monopoly of legitimate violence (Hobbes, 2014 [1651]). However, the type of violence that some relevant coalitions have used to protect their positions is far from what Hobbes would consider legitimate violence. In many of the world's most violent countries, not only has the state been deliberately abdicating the monopoly of violence, but some privileged groups have been cooperating with criminals to protect their interests and emphasize their dominance in society.

A structural affinity exists between the interests of violent privileged groups and a country's productive structure. To see how the productive structure has shaped interests to accommodate a violent order and how they, in turn, have impacted homicide rates, we must consider the productive structure as both a provider of opportunities and material constraints and as the basis for forming societal interests.

According to [Cardinale & Scazzieri \(2018\)](#), the crucial patterns of interests in society relate to economic structures since productive structures are the basis for forming socio-economic groups and economic sectors. The productive structure can be conceived as a system of interdependencies among the various actors of the economy ([Tassinari,](#)

2021). Among the most relevant components of this system are individuals, social classes, industries, and sectors.

The perceived relative position of an actor within the economic structure vis-à-vis the position of other actors leads to the recognition of its interests and goals regarding the interests and goals of others. With the recognition of the actors' position and through social interactions, space opens up for cooperation – or competition – with the other actors of the economic system to advance their particular goals. The compatibility of interests makes way for the aggregation of actors into groups, establishing the foundations for creating socio-economic coalitions with shared interests and goals. These coalitions become aware of their positions in the productive structure and the opportunities and constraints for achieving their common goals (Tassinari, 2021).

The alignment of interests to reach objectives by different socio-economic groups is possible through political negotiation, through politics itself. Tassinari (2021) argues that a typical feature of this process is that the exercise of power among the relevant groups takes place mainly in the political sphere, leading to conflicts and agreements. The author, however, does not rule out the exercise of power and the protection of interests through violence. Interest groups can potentially seek forms of influence outside the political arena, exercising their power through violence. For example, negotiation for preserving interests and attaining objectives can involve civil wars and unconventional alliances, such as cooperation with criminal groups, paramilitaries, and militias (Acemoglu et al., 2013). In healthy societies, political and economic coalitions seek to address problems through customary politics and protests. Unsurprisingly, in the deadliest countries, influential parts of society sometimes prefer to secure a larger share of the surplus and influence public choices through violent or illegal means.

If state complicity benefits powerful groups with a comparative advantage in violence, these groups can, through violence, secure a larger share of the results generated (Couttenier et al., 2017). We can observe this dynamic in many of the deadliest countries, where ruling class leadership occurs side by side with criminal groups, in a symbiotic relationship mutually beneficial for both. In Colombia, agribusiness, such as land ownership,

ranching, and extractive industries, has become an increasingly important economic base for the elite employing paramilitary forces. This symbiotic relationship has raised Colombia's violence levels, mainly due to displacement and human rights violations (Hristov, 2014). In Mexico, the militarization of some regions as part of the War on Drugs has facilitated the operations of extractive industries and mining companies, which with the help of state forces and private armed groups, threaten the local population and those who offer resistance (Hristov, 2014). In these places, relevant local coalitions would not be committed to maintaining security since they benefit from expanding social conflict and violence, manipulating it to perpetuate old patterns of domination and power.

History has already shown us that the specialization of the productive structure in exportable agricultural and mineral goods creates a fertile ground for the spread of violence. Poorly diversified economic structures and the interests that emerge from them have manifested violence throughout history to the present day.

The economic literature on armed conflicts has shown that poorly diversified economies with productive structures highly dependent on few natural resources exhibit higher risks of violent conflict. The evidence stresses that the risk of civil wars highly depends on the share of a country's primary commodities exports. For example, Collier & Hoeffler (2004) shows that at 33% of the share of commodity exports in GDP, the risk of armed conflict reaches 22%. Meanwhile, in a country that does not have such exports, the threat of a civil war is only 1%. Furthermore, by analyzing the effects of different commodities on the risk of armed conflict, the authors reveal that at average values of primary commodities export, non-oil commodities lead to similar effects on armed conflict risks as oil exports. Berman et al. (2017) has also documented how exploiting African mineral-rich areas has escalated violence throughout the region. In this context, violence is used to directly expropriate a more significant share of the revenues from exploiting natural resources and guaranteeing the right to exploit these minerals. Dependence on natural resources can also make a country vulnerable to violence since the exploitation and trade of primary commodity exports provide the necessary means to raise finance for the tools of war (Bannon & Collier, 2003).

While there is a body of evidence highlighting the impacts of natural resource dependence on the risks of civil wars and conflicts between states, few studies analyze the effects of the productive structure on a violent phenomenon even more recurrent than civil wars: homicides. Some studies dedicated to understanding the link between productive structure and the incidence of homicides have focused on the effects of natural resources' dependence. [Couttenier et al. \(2017\)](#) were the first to describe a "homicide's resource course" by analyzing how mineral discoveries in the United States in the 18th century were associated with increased violence in the country. Using panel data for 63 US counties between 1790 and 1900, the authors found a positive and significant relationship between new mineral discoveries and homicide rates, but only in counties that experienced natural resources discoveries before state development. The authors' findings highlight how the combination of absent state and undiversified productive structures imply high levels of homicidal violence. Furthermore, the authors find that the effects of eighteenth-century mining discoveries on per capita homicides have persisted over time. Their effects can still be seen today in the high incidence of homicides in some areas of the United States. Further adding to the homicide resource curse were the findings of [Baier & Baten \(2017\)](#). Analyzing data for 65 countries from 1890 to the 1990s, the authors use silver production as a resource indicator to demonstrate that higher silver dependence leads to significantly higher homicide rates, especially when interacting with a poor institutional context. The results show that the reliance on natural resources can have many dimensions, including impacts on interpersonal violence. The absence or lack of commitment from the state to guarantee property rights makes it possible for groups that are prone to use violence to benefit from the high incomes generated by the exploitation of natural resources ([Baier & Baten, 2017](#); [Couttenier et al., 2017](#)).

The evidence shows that dependence on the extraction of valuable resources, such as silver, gold, and diamonds, not only increases the risks of armed conflicts but also has detrimental effects on homicidal violence. However, the existing literature has focused on the role of dependence on primary commodity exports (e.g., the share of natural resources exports regarding GDP, ([Baier & Baten, 2017](#)); and the number of mineral discoveries

(Couttenier et al., 2017)) to assess the effects of the economic structure on homicides quantitatively. By focusing only on the dependence on natural resources, the literature keeps the discussion open about how the economic structure's broader organization impacts countries' violence levels.

Furthermore, although these contributions generally acknowledge the interaction of violence with economic structure – namely, dependence on natural resources – much economic analysis tends to look to material objectives. To the best of our knowledge, empirical literature lacks explicit considerations of the role of the productive structure in organizing society into socio-economic groups uncommitted to stopping violence

For example, when we refer to homicidal violence, many commodity-producing sectors and the interest groups linked to them are hardly affected by this type of violence. That is because, in addition to high incomes, they operate in productive enclaves with few backward or forward connections with the rest of the economy (Bannon & Collier, 2003). The insufficient proximity of these sectors to the rest of the society may have resulted in a lack of commitment to solving violence through collective compromise. In contrast, more complex and integrated economic sectors, such as manufacturing and services, perform highly interdependent activities which are easily subject to disruptions caused by high homicide rates. Interdependent sectors directly impacted by violence can promote cooperation and commitment within and across groups to target violence reduction as a desirable objective for the security of their businesses (Moncada, 2013). These sectors can foster social pacification policies and influence the implementation of public policies to reduce violence.

Although the interests are not uniquely determined within the productive structure – and the productive structure is by no means the only way to shape goals within societies –, the interests toward more or less citizen security cannot be considered autonomous from this structure. As Cardinale emphasizes, interests are "structurally grounded" (Cardinale, 2017: 217) in the sense that there are "interests that are compatible with existing economic structures (...)" (Cardinale, 2017: 218). The significance of Cardinale's assertion is that it highlights economic structure as a possible indicator of interest orientations. According to

our interpretation of this argument, structural change may come together with shifts in interests toward greater security for all.

Assume we can understand the productive structure both by its role in providing material opportunities and substantiating the formation of interests within societies. In that case, a notable result derived from the structural change process is that it could bring changes in societal goals. Such a change may contribute to the pacification of violence. Because of its effects on society's overall coordination and integration, structural change aimed at the economic sophistication of product exports may entail greater interdependence among individuals. The interdependence reflected in complex economic systems may likewise exist in interpersonal relations and, thus, reduce homicides. We expect the same principle that unites sectors in an interdependent productive structure may protect citizens from lethal violence.

6 The Connection Between Violence and Economic Complexity

While the relationship between violence and economic structure has been historical, today, there is a novelty in the way we measure the economic structure. The recent development of measures of economic complexity has expanded our ability to quantify the sophistication and diversification of a country's productive structure (Hidalgo, 2021). Those measures that, over the 20th century, were based mainly on simple quantitative approaches (e.g., the participation of agriculture, industry, and services in the economy) have advanced in the past decade with the introduction of Economic Complexity measures.

6.1 Disentangling Economic Complexity

Economic complexity literature is based on the idea that a country's economic performance does not depend only on the monetary values of economic outputs. Development potential also relies on the *sophistication* of what is produced and exported by an economy (Hausmann et al., 2011). The product exports by a country or region help to extract key information on what is inside a society regarding its productive capabilities. Productive capabilities include tangible factors and hard-to-measure attributes such as the productive knowledge that a location has accumulated, the quality of the social capital, and the organizational aspects of an economy (Hartmann, 2014). The diversity of tangible and intangible capabilities predicts an economy's capacity to generate income (Hausmann et al., 2011).

These capabilities are manifested in a country's diversity (the number of products a given country exports with revealed comparative advantage) and product ubiquity (the number of countries that export a specific product with revealed comparative advantage) (Hidalgo & Hausmann, 2009). Revealed comparative advantage (RCA) is the ratio of a country's share of a product export to the global exports of this product. Intuitively, it is possible to interpret the RCA measure as follows: a) If $RCA > 1$, country c presents high competitiveness in the production and export of product p in period t or b) If $RCA < 1$, c is not competitive in the production of product p .

A complex economy can produce a wide range of sophisticated and low-ubiquity products, i.e., goods that many countries cannot make (e.g., electric cars). In turn, less complex economies have a relatively small diversity of goods that are usually ubiquitous (e.g., agricultural goods and textiles), reflecting less sophistication in available productive capabilities or less capacity to bring existing capabilities together to create new technological goods and services (Hidalgo & Hausmann, 2009). It follows that, when analyzing two export baskets of equivalent monetary values, the basket that exports the more sophisticated goods will produce greater future development than an export basket based on simpler products.

Formally, the RCA_{cp} matrix allows to define the diversification D of a country c and the ubiquity U of a product p as follows:

$$D_{c,0} = \sum_p RCA_{cp} \quad (6.1)$$

$$U_{p,0} = \sum_c RCA_{cp} \quad (6.2)$$

Where RCA_{cp} is a matrix equal to 1 if country c has RCA in product p and 0 otherwise

Thus, it is possible to construct a $M_{cc'}$ matrix connecting countries that export similar products, weighting it by the inverse of the ubiquity of product p and normalizing it by the diversity of country c (Hidalgo & Hausmann, 2009):

$$M_{cc'} = \frac{1}{D_{c,0}} \sum_p \frac{M_{cp}M_{c'p}}{U_{p,0}} \quad (6.3)$$

Finally, the Economic Complexity Index is defined by an eigenvalue equation:

$$ECI_c = \frac{K_c - \langle K \rangle}{sd(K)} \quad (6.4)$$

Where K_c is the eigenvector associated with the second largest eigenvalue of $M_{cc'}$. Countries' Economic Complexity Indexes (ECI) are available online at the website of

The Observatory of Economic Complexity. These indexes were employed in the empirical analyses in Chapter 7.

6.2 Economic Complexity and Homicides: What is the link?

Recent studies have shown that structural change aimed at the sophistication of product exports can contribute to different economic performance (Hidalgo et al., 2007). However, within this process of industrial modernization, not only quantitative changes take place; valuable qualitative transformations of social nature may also occur with improvements in people's living conditions (Hartmann, 2014). That has encouraged the use of the Economic Complexity Index to understand aspects of social well-being, highlighting the role of economic sophistication in reducing income inequality (Hartmann et al., 2017), creating jobs (Adam et al., 2021), and improving the population's health conditions (Vu, 2020).

Here, I argue in favor of a relationship between economic complexity and another dimension of social well-being: freedom from violence. The complexity of product exports reflects a country's ability to combine different capabilities to create thousands of new products. Hence, the complexity of an economy reflects people's ability to connect in social and professional networks to produce increasingly complex goods and services (Hartmann et al., 2017). Following Durkheim's central thesis in the *Division of Labor* (1984 [1893]), where the economic specialization is very complex and there is a great deal of diversity in societal tasks, the growing interdependence between individuals may change social interests toward greater solidarity and make societies less likely to accept acts that might disrupt themselves.

In the course of development, various societies have moved from being primarily agricultural to industrial societies, which means that they have moved from a mechanically based solidarity to an organic one in Durkheim's formulation. Just as Durkheim proposed for the division of labor, if we understand economic complexity as representing this transition to a new kind of societal interests that foster solidarity among individuals, we have at our disposal a fine-grained measure not only for the complex economic sophistication of modern industrial societies but also for the set of linkages that connect individuals.

Hence, respect for human lives should be more solid the more numerous and substantial these bonds are.

Since specialized activities are carried out more or less continuously, they cannot be hampered without damages of all kinds. Homicide episodes then become more serious as the interdependence between individuals becomes more important in social and economic life (Pinker, 2011). If in less complex societies, peace can be unstable without major inconveniences, in specialized ones, peace cannot be undermined without threatening the very unity of the social body. That is why disrespect for human lives seems to be endemic in some societies, whereas, in others, homicides have become less and less numerous.

We can then conceive economic complexity beyond its necessary condition for increasing societies' productive force and material development. We can say that an additional characteristic of economic complexity is that it enunciates the transition to a new kind of collective interests that foster respect for human lives in specialized societies. As the division of labor in society becomes increasingly complex, it makes individuals interdependent, as we have said so far, by specializing in societal tasks. As this process continues, the integration of society becomes closer. This integration ceases to be an internal resolution and is translated externally by social consequences, such as reduced homicide rates. The proposal of economic complexity as a vivid source of social bonds in modern industrial societies is in tune with some authors' prognosis about the relationship between economic complexity and social capital (Hartmann, 2014; Hartmann et al., 2017.

Other arguments may also support the hypothesis that the complexity of the productive structure may be related to a country's levels of violence. Different productive activities in the economy offer people various job opportunities, as the production of sophisticated goods (e.g., medical equipment and computers) tends to require a higher level of knowledge and productive capabilities than those found in simpler products (e.g., textiles and agriculture). The quality of an economy's productive capabilities increases not only the availability of jobs but also the quality of those opportunities, thus reducing the economic benefits of violence. Under an anthropological analysis of the causes of violence, Gaviria (2000) states: *"What appears as the main driving force in most ethnographic*

studies is not so much the absence of reasonable economic opportunities as the absence of social mobility". This means that offering only reasonable economic opportunities is not enough to prevent the spread of violence. By highlighting the role of sophistication in produced and exported goods, the economic complexity measures can provide relevant information about the quality of economic and social opportunities available in an economy that is not captured by aggregate development measures, such as aggregate employment indicators and GDP per capita ([Hartmann et al., 2017](#); [Hidalgo, 2021](#)).

7 The Statistical Nexus

Emilie Durkheim's insights regarding the transition from traditional to complex societies allow for a broadening of the theoretical perspective developed by Elias (2000 [1939]), which considers the expansion of the state monopoly of violence as the primary causal force of violence reduction. That means that violence decline would not have been sustained only by the state's monopoly on legitimate violence but also by the increasing interdependence among the members of society through economic specialization, which constitutes one of the fundamental sources of solidarity and respect for human lives in modern societies.

The arguments presented so far assume that the state is the primary source of violence. Complicit institutions link political power and authority to cooperation with criminals to benefit relevant groups in society that perpetuate violence, reproducing patterns inherited from the colonial era. Complicit states emphasize private interests based on specific objectives of powerful groups and strata rather than citizen security based on political grounds. When criminality and corruption invade the state, the state itself is perpetuating violence. Yet, if the division of economic functions could produce a high degree of interdependence, this could prevent modern societies from decaying through violence. Following the modernization literature, it is hypothesized that while increases in homicides may characterize the early stages of industrial sophistication, the long-term trend is toward reduced homicide rates.

In sum, a decline in violence occurs when institutional and economic structures support a process of violence pacification. We can summarize these arguments in the form of hypotheses: (1) Complicit states increase national homicide rates; (2) The complexity of the division of productive activities would first raise and then decrease homicide rates;

7.1 Data

7.1.1 Dependent variable

This study focuses on the analysis of homicide as an indicator of lethal violence since researchers have noted the reliability of data in cross-national homicide compared to other types of offense (Eisner & Fearon, 2021; Fajnzylber et al., 2002). Since homicide is a severe offense for the victim, the perpetrator, and the general public, homicide has become a widely collected and reported statistic. It also is considered a relatively valid and reliable proxy for violent crime and the level of lethal violence in states (Gurr, 1981). Univariate analysis reveals that homicide rates have a highly skewed distribution for the sample investigated. To improve the fit in the empirical analysis, the homicide rates were transformed using natural logarithms.

The data on homicide rates are from the World Health Organization (World Health Organization, 2021) Vital Statistics, which provides estimates for homicide rates for several countries. The World Health Organization dataset contains data for 183 countries from 2000-2019. However, it must be noted that, in the present analysis, were excluded those countries which WHO have relied on regression model procedures to predict homicide rates when data are missing. In these cases, predictor variables used in the WHO's model-based estimates may overlap with the predictors used to estimate homicide rates under investigation in this work (e.g., Gender Inequality Index predictor in WHO model-based estimates overlapping with Economic Complexity Index). Thus, to avoid any relationship between the dependent variables and the explanatory variables being a result of the procedures of the measurement of homicide rates, only those countries for which the agencies of the respective countries directly provide homicide data were included.

7.1.2 Independent variables

Data on institutional quality were extracted from the World Bank's Worldwide Governance Indicators (Kaufmann et al., 2010). The choice was WGI because it is considered a reliable and comprehensive data set to examine cross-national variation in institutional quality

and its relationship with violence. Three indicators on the WGI data set were identified as potential measures of the state's complicitness with criminal groups: *Voice and Accountability*, *Corruption Control*, and *Political Stability*. Voice and accountability is described as the extent to which citizens can participate democratically in choosing their rulers and the extent of freedom of expression and association present in society. Democracies have institutional structures that reflect the commitment of political institutions to solve conflicts peacefully through electoral competition rather than using authoritarianism and violence as alternatives to conflict resolution. Thus, higher levels of democracy (as expressed by the Voice and Accountability variable) may result in lower homicide rates. Corruption control is defined as the extent to which political power is exercised for private gains and the capture of political institutions by elites and private interests. Greater control of corruption is therefore expected to reduce homicide rates in countries. Political violence is defined as the probability that a country's institutions will be overthrown by unconstitutional means or face politically motivated violence such as coups d'état, civil wars, and terrorism. The expectation is that the greater the political stability, the lower the incidence of homicides. Each WGI indicator has a standardized score ranging from -2.5 to 2.5. Lower scores represent lower levels of institutional quality. It is worth noting that WGI data on the rule of law was not included in the analysis since this measure includes data classified as homicides, so the rule of law as a component would result in overlap between this variable and the dependent variable.

Economic Complexity Index (ECI) data is available on MIT's Observatory of Economic Complexity (Simoes & Hidalgo, 2011). This indicator is built from United Nations (UN Comtrade) international trade data to measure the specialization of countries' productive activities. In order to consider whether ECI could impact violence in a non-linear way, a squared ECI term is included.

7.1.3 Control variables

Several control variables based on previous research were included in the empirical analysis: the Gini index and infant mortality to control for relative and absolute poverty, respectively;

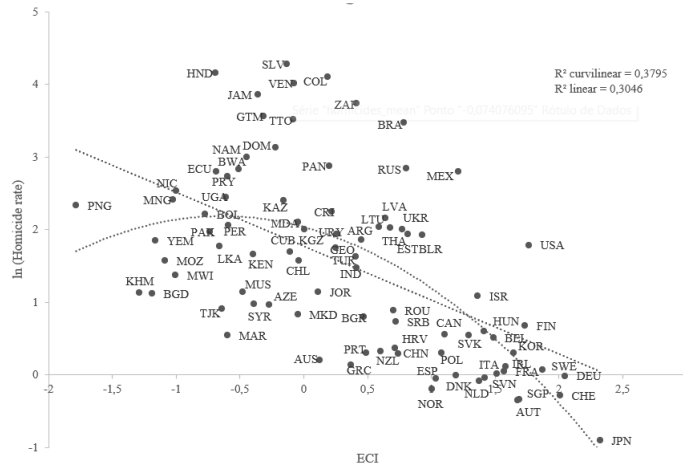
the log GDP per capita at constant 2015 US\$ as a measure of the general average level of income; schooling, as defined as the average number of years of education received by the population aged 25 or more; the share of youth males age 15 to 24-year-old to control for age composition; the share of the total population living in urban areas as a demographic characteristic. Data on the Gini index, infant mortality, GDP per capita, and urbanization were drawn from the World Bank's Development Indicators (World Bank, 2011). Mean years of schooling and percentage of youth males were extracted from United Nations (United Nations Office for Drugs and Crime, 2019).

The final sample of countries was selected according to a combination that considered their presence simultaneously within each dataset used in the study (WHO, WGI, and OEC datasets). Thus, only countries listed in all datasets simultaneously were considered, resulting in a sample containing information on 69 countries. In order to investigate how the specialization of social and productive activities and the institutional aspects affect lethal violence in societies with different levels of development, the empirical analysis is carried out considering, at first, all 69 countries simultaneously (Table 7.2). Then, the analysis is done only for the subset of 30 developed countries (Table 7.3 and 7.4), and finally, only for the subset of 39 non-developed countries, which includes developing countries and countries in transition (Table 7.5 and 7.6). Countries were grouped into developed and non-developed according to the United Nations development classification. Table A.1 lists the countries included in the analysis.

7.2 Exploratory Data Analysis

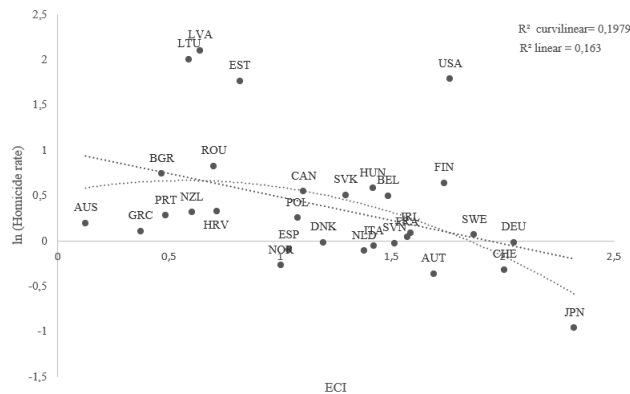
Figure 7.1-7.3 illustrates the bivariate relationship between the natural logarithm of the average homicide rate and the Economic Complexity Index over the period 2000-2019. Figure 7.1 displays this relationship for all 69 countries combined, while Figures 7.2 and 7.3 show this relationship for two subsets consisting of only 30 developed countries and 39 non-developed countries, respectively. Also depicted in the graphs are the linear and non-linear trend lines for the data and the R^2 value associated with each trend line.

Figure 7.1: Bivariate relationship between the natural logarithm of homicide rates and economic complexity for 69 countries at all development levels during 2000-2019.



Source: World Health Organization estimates of rates of homicides and the Observatory of Economic Complexity. Elaborated by the author.

Figure 7.2: Bivariate relationship between the natural logarithm of homicide rates and economic complexity for 30 developed countries during 2000-2019.

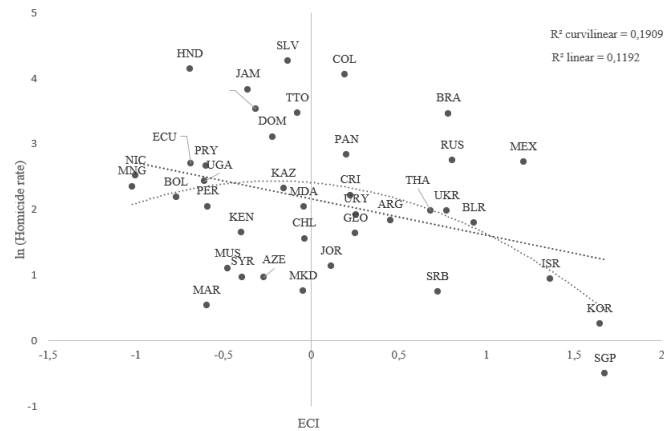


Source: World Health Organization estimates of rates of homicides and the Observatory of Economic Complexity. Elaborated by the author.

The scatterplots suggest the possibility of a curvilinear relationship between economic complexity and homicide rates. Deploying the modernization perspective on homicides to interpret these results, as countries go through the early stages of the industrial sophistication process, they may experience an escalation of social disorder reflected in rising rates of homicide. However, as countries advance in the process of industrial sophistication, they would experience a reduction in homicide rates due to higher complexity levels in their social and economic activities.

In all samples, the R^2 of the curvilinear trend line is higher than the R^2 of the linear line. This means that the variation in the homicide rate attributed to the ECI would

Figure 7.3: Bivariate relationship between the natural logarithm of homicide rates and economic complexity for 39 non-developed countries during 2000-2019.



Source: World Health Organization estimates of rates of homicides and the Observatory of Economic Complexity. Elaborated by the author.

be better explained by a model that considers the possibility of a non-linear relationship between these two variables. This data pattern can be modeled through a second-degree polynomial function with a squared ECI term.

Comparing the difference in R^2 of the curvilinear and linear trend lines, we have for the entire sample of countries a value equal to 7.49%; for the subset of developed countries, a value of 3.49%, and for non-developed countries, 7.17%. As the difference between the R^2 of the linear and curvilinear trend lines for developed countries is small, it is expected that for the subset of developed countries, the non-linear relationship will exhibit a lower fit to the data than that observed for non-developed countries, and the set of all countries. Naturally, industrially developed countries have already managed to overcome the initial stages of the industrial sophistication process that are assumed to increase homicide rates, which would smooth out the ascending part of the curve. Therefore, it is expected that the non-linear relationship between homicide and ECI to be less predominant in developed countries.

Next, the simple correlations between variables are presented in Table 7.1. Economic complexity, its squared term, and the institutional variables voice and accountability, political stability, and corruption control show a negative association with homicide rates.

Table 7.1: Correlation matrix between homicide rates and the independent variables

Variables	ln(Homicide rate)	ECI	ECI2	Voice and accountability	Political stability	Corruption control	Gini	Infant mortality	ln(GDP15 pc)	Schooling	Urbanization	Male population
ln(Homicide rate)	1.00											
ECI	-0.63	1.00										
ECI2	-0.56	0.80	1.00									
Voice and accountability	-0.48	0.58	0.46	1.00								
Political stability	-0.54	0.52	0.47	0.73	1.00							
Corruption control	-0.65	0.68	0.59	0.82	0.76	1.00						
Gini	0.73	-0.61	-0.46	-0.34	-0.54	-0.49	1.00					
Infant mortality	0.54	-0.69	-0.43	-0.59	-0.58	-0.65	0.60	1.00				
ln(GDP15 pc)	-0.63	0.78	0.62	0.79	0.72	0.87	-0.48	-0.76	1.00			
Schooling	-0.56	0.68	0.47	0.53	0.54	0.60	-0.73	-0.69	0.71	1.00		
Urbanization	-0.29	0.49	0.36	0.43	0.38	0.59	-0.07	-0.57	0.64	0.46	1.00	
Male population (age 15-24)	0.73	-0.77	-0.54	-0.64	-0.57	-0.67	0.68	0.74	-0.75	-0.70	-0.40	1.00

Source: Elaborated by the author.

Notes: Correlation matrix between the natural logarithm of homicide rates, economic complexity, and its squared term, and the institutional variables voice and accountability, political stability, corruption control, and the other socio-economic factors: income inequality, a country's infant mortality rate, income level, average years of schooling, urbanization, and percentage of the young male population.

Next, we proceed to pooled cross-sectional estimation to see if there is a significant correlation between homicide rates and institutional and economic complexity variables, controlling for other factors of violence like economic deprivation, development, and demographics.

7.3 Estimation

To empirically evaluate the extent to which the differences in homicide rates across countries are due to an institutional willingness to centralize legitimate violence and to an economic structure that supports societal interdependence conducive to less violent societies, pooled OLS regression for 69 countries from 2000 to 2019 was used. Because the explanatory variables have slight temporal variations, it is unclear whether they vary sufficiently over the entire 20-year period to allow for reliable analysis. Typically, institutional and economic structures vary much more between countries than within a country over time. The pooled OLS cross-section regression is a method that allows us to make use of these variations between countries. Formally, the following model is tested:

$$y_{i,t} = \alpha + \mathbf{X}_{i,t}\boldsymbol{\beta} + u_{i,t}, \quad u_{it} \sim (0, \sigma^2) \quad (7.1)$$

The purpose of formulating the model 7.1 is to try to explain the observed values of the homicide rates in terms of a linear function of the explanatory variables. Intuitively, we have i different countries, observed for t instants of time. At each instant t , $\mathbf{X}_{i,t}$ covariates of a certain country i are observed. These characteristics should help explain the realization of the dependent variable $y_{i,t}$. The dependent variable $y_{i,t}$ denotes the natural logarithm of homicide rates per 100,000 inhabitants; $\mathbf{X}_{i,t}$ contains the explanatory variables ECI and its squared term, voice and accountability, political stability and corruption control, gini index, infant mortality, $\ln(\text{GDP15 pc})$, schooling, urbanization and youth male population; $\boldsymbol{\beta}$ is the corresponding vector of coefficients to be estimated; α is the intercept, and $u_{i,t}$ is the error term. Some assumptions about the properties of the error terms are made. First, it is assumed that $u_{i,t}$ is a random variable. Secondly, it is assumed that, whatever the value of $X_{i,t}$, the expectation of the random variable $u_{i,t}$ is zero such that $E[u_{i,t}|X_{i,t}] = 0$. This assumption usually identifies the unknown coefficient $\boldsymbol{\beta}$, in the sense that, under these assumptions, 7.1 can be true only for specific coefficient values. Furthermore, all models were estimated using standard error correction for serial and cross-sectional correlation and heteroscedasticity.

7.4 Results

Table 7.2 shows the pooled OLS regressions for all 69 countries from 2000 to 2019. Columns 1 to 11 show a sequence of models that regress the natural logarithm of homicide rates against the economic complexity index (ECI) and its squared term, the institutional aspects of voice and accountability, political stability and corruption control, and other socio-economic variables, such as income inequality, infant mortality, GDP per capita, average years of schooling, urbanization, and participation of the young male population (aged between 15 and 24 years). Column 1 includes all variables. Together, the variables explain 79.4% of the variation in homicide rates across all countries in the sample. Columns 2 through 11 remove the variables one by one to explore the contribution of each to the complete model. In all models, the ECI and its squared term are significant predictors of homicide rates. However, while the ECI shows a positive association, its squared term is negatively associated with homicide rates.

Table 7.2: Pooled OLS regression models for 69 countries at all development levels during 2000-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
ECI	0.392*** (0.056)		0.390*** (0.057)	0.371*** (0.057)	0.396*** (0.057)	0.177*** (0.058)	0.412*** (0.053)	0.325*** (0.059)	0.391*** (0.057)	0.408*** (0.056)	0.149** (0.065)
ECI ²	-0.149*** (0.031)		-0.140*** (0.031)	-0.146*** (0.031)	-0.156*** (0.032)	-0.200*** (0.025)	-0.179*** (0.029)	-0.175*** (0.031)	-0.149*** (0.031)	-0.177*** (0.029)	-0.076** (0.036)
Voice and accountability	-0.274*** (0.066)	-0.270*** (0.063)		-0.225*** (0.059)	-0.307*** (0.051)	0.377*** (0.058)	-0.275*** (0.064)	-0.332*** (0.066)	-0.271*** (0.065)	-0.304*** (0.067)	-0.474*** (0.065)
Political stability	0.105** (0.052)	0.072 (0.053)	0.035 (0.048)		0.102* (0.052)	-0.150*** (0.051)	0.113** (0.052)	0.047 (0.054)	0.106** (0.052)	0.059 (0.053)	0.218*** (0.053)
Corruption control	-0.052 (0.050)	-0.076 (0.052)	-0.182*** (0.039)	-0.045 (0.050)		-0.671*** (0.049)	-0.055 (0.051)	-0.162*** (0.049)	-0.052 (0.051)	0.004 (0.051)	0.001 (0.056)
Gini	0.056*** (0.005)	0.053*** (0.005)	0.049*** (0.005)	0.052*** (0.004)	0.057*** (0.005)		0.054*** (0.005)	0.049*** (0.005)	0.056*** (0.004)	0.061*** (0.005)	0.083*** (0.005)
Infant mortality	-0.012** (0.005)	-0.018*** (0.004)	-0.012** (0.005)	-0.012** (0.005)	-0.012** (0.005)	-0.002 (0.004)		-0.007 (0.005)	-0.011** (0.005)	-0.014** (0.005)	0.003 (0.006)
ln(GDP15 pc)	-0.345*** (0.051)	-0.301*** (0.049)	-0.384*** (0.052)	-0.324*** (0.049)	-0.366*** (0.048)	0.032 (0.057)	-0.317*** (0.049)		-0.351*** (0.050)	-0.259*** (0.048)	-0.499*** (0.061)
Schooling	-0.004 (0.020)	0.005 (0.020)	-0.004 (0.019)	-0.008 (0.020)	-0.004 (0.020)	-0.034** (0.015)	0.002 (0.020)	-0.022 (0.020)		0.004 (0.019)	0.004 (0.021)
Urbanization	0.012** (0.002)	0.012** (0.002)	0.012** (0.002)	0.011** (0.002)	0.011** (0.002)	0.012** (0.002)	0.012** (0.002)	0.008** (0.002)	0.012** (0.002)		0.015** (0.002)
Young male	0.195*** (0.014)	0.177*** (0.013)	0.206*** (0.014)	0.199*** (0.013)	0.194** (0.014)	0.237*** (0.013)	0.187*** (0.013)	0.209*** (0.013)	0.195*** (0.014)	0.203*** (0.014)	
Constant	-1.080** (0.327)	-1.114** (0.317)	-0.822 (0.334)	-1.129** (0.325)	-0.925* (0.485)	-3.103** (0.497)	-1.420*** (0.507)	-3.764*** (0.336)	-1.116** (0.491)	-1.539*** (0.512)	2.112*** (0.360)
Observations	910	910	910	910	910	1,304	910	910	910	910	910
R ²	0.796	0.787	0.791	0.795	0.796	0.659	0.794	0.786	0.796	0.788	0.735
Adjusted R ²	0.794	0.785	0.789	0.793	0.794	0.657	0.792	0.784	0.794	0.786	0.732
F Statistic	310.119** (df = 11; 898)	370.286** (df = 9; 900)	344.230*** (df = 10; 899)	348.682*** (df = 10; 899)	350.909** (df = 10; 899)	250.280** (df = 10; 1283)	346.986** (df = 10; 1283)	330.675*** (df = 10; 899)	351.388*** (df = 10; 899)	333.967*** (df = 10; 899)	249.816*** (df = 10; 899)

*p<0.1; **p<0.05; ***p<0.01. Standard errors in parenthesis.

This curvilinear association between the sophistication of the productive structure and homicide rates suggests that countries in the intermediary stages of changing their productive structures tend to experience an increase in homicide rates. Nonetheless, the rise in lethal violence tends to attenuate as countries go through the industrial process. This result corroborates hypothesis 2 and is in line with the predictions from the modernization perspective regarding the behavior of lethal violence throughout society's modernization process.

Among the institutional variables, voice and accountability is the only one that shows statistical significance in all models. Despite its relevance, however, the voice and accountability variable signal is not robust to controls. In Column 6, removing income inequality causes the voice and accountability variable to take on a positive sign, in contrast to the negative sign it takes on in the other models. That means that while democratic participation is a significant predictor of lethal violence, the direction of this impact is uncertain. As already mentioned, the sign and significance of political stability and corruption control variables are not robust to the inclusion of controls. The findings, therefore, do not support the hypothesis that corruption control and political stability are predictive factors of differences in homicide rates across all countries.

Income inequality (as measured by the Gini index) shows a positive and significant association with homicide rates. Poverty, as measured by the infant mortality rate, is not significant in explaining variation in homicides. These results suggest that it is the condition of relative deprivation (inequality) rather than the condition of absolute deprivation (poverty) that is important in explaining variations in homicide rates across countries.

The sign and significance of the relationship between GDP per capita and homicide rates are not robust to controls. In column 6, the exclusion of the income inequality variable makes GDP per capita a positive, although not significant, predictor of homicide rates. This finding suggest a multicollinearity problem, i.e., a high correlation between income inequality and GDP per capita. A high correlation between two independent variables means that they share essential information, which makes it difficult to disentangle

the estimated effects of each variable on homicide rates. The impossibility to separate variables' effects is a problem, especially in this case, because, although income inequality and GDP per capita exhibit high statistical correlation, the theoretical explanation for why each of these variables affects homicide rates is substantially different. The primary way to handle this problem is by excluding one of the multicollinear variables from the regression model. However, excluding inequality or income from the model would omit one of the most traditional variables discussed in the macro literature on the determinants of homicide rates. The omission of important variables from the model would lead to a misspecification problem, which is even more severe than the multicollinearity problem (Russel & MacKinnon, 2004). Therefore, it was chosen to keep both variables, income inequality and GDP per capita, in the regressions.

Likewise, average years of schooling do not significantly correlate with cross-national homicide rates. In turn, urbanization and the proportion of men between 15 and 24 in the total population show a positive and significant association with homicide rates.

Among all the variables, income inequality is the variable that makes the most significant contribution to explaining the variance in the homicide rate. That is because the semi-partial correlation of inequality (the difference between the adjusted R^2 of the complete model (Column 1) and the model where only inequality is excluded (Column 6) is 17.25%, meaning that inequality explains 17.25 % of the variance in homicide rates. The portion of men between 15 and 24 years old offers the second most significant contribution to explaining the variance in homicides between countries, with a semi-partial correlation of 7.80%, followed by GDP per capita (1.25%) and by the economic complexity index (1.13%).

Tables 7.3 to 7.6 test these results by grouping countries into developed (highly industrialized) and non-developed (developing and transitioning) countries. This is because non-developed countries show different stages of economic specialization and significant variance in institutional aspects vis-a-vis developed countries that have led the former to have, in general, higher rates of homicide than developed nations. The United Nations classifies all countries in the world into three major groups: developed economies, developing

economies, and economies in transition (Unt, 2022). This classification seeks to reflect the basic economic conditions of the countries. For the empirical analysis, the 69 countries were grouped into two categories: developed and non-developed (which includes developing economies and economies in transition). The classification of countries used in the empirical analysis by the level of development is in Table A.1.

Table 7.3 shows the pooled OLS regression results for 30 developed countries from 2000-2019. Columns 1 through 11 regress the natural logarithm of homicide rates against economic complexity and its squared term, the institutional variables of voice and accountability, political stability, and control of corruption, also controlling for the effects that other socio-economic factors have on homicide rates, such as income inequality, infant mortality, income level, education, urbanization, and the participation of young men. Together, the variables explain 59% of the variation in homicide rates across developed countries. Similar to what we observed for the ECI in the regression for all countries (Table 7.2), in the regression for developed countries, the economic complexity index is shown to be a significant predictor of homicide rates and exhibits a non-linear relationship. Although the ECI loses some significance compared with the results presented for all countries, it remains a significant predictor of homicide rates. Naturally, as the sample for developed countries includes countries with more complex economies, there is slight variation in the ECI, and therefore, the indicator loses some of its explanatory power. Notably, the variability of economic complexity around the mean, as measured by standard deviation, is greater for the sample of all countries (0.86, Table A.2) than for developed countries (0.57, Table A.3).

Table 7.3: Pooled OLS regression models for 30 developed countries during 2000-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
ECI	0.542*** (0.223)	0.541*** (0.221)	0.541*** (0.221)	0.501** (0.225)	0.538** (0.221)	0.303* (0.159)	0.547** (0.220)	0.440* (0.250)	0.642*** (0.224)	0.369* (0.217)	0.777*** (0.215)
ECI ²	-0.230** (0.094)	-0.228** (0.094)	-0.228** (0.094)	-0.213** (0.095)	-0.225** (0.094)	-0.187*** (0.066)	-0.234** (0.092)	-0.232** (0.102)	-0.233** (0.097)	-0.184** (0.089)	-0.335*** (0.092)
Voice and accountability	-0.091 (0.217)	-0.068 (0.227)	0.074 (0.088)	-0.064 (0.200)	0.037 (0.138)	0.093 (0.190)	-0.054 (0.211)	-0.564*** (0.199)	-0.491** (0.209)	0.035 (0.220)	0.540** (0.239)
Political stability	0.080 (0.091)	0.020 (0.091)	0.074 (0.088)	-0.064 (0.200)	0.100 (0.094)	-0.202** (0.091)	0.080 (0.090)	0.095 (0.092)	0.161* (0.085)	-0.129 (0.080)	0.200** (0.098)
Corruption control	0.000 (0.082)	0.077 (0.086)	0.065 (0.085)	0.107 (0.085)	0.083 (0.082)	-0.081 (0.082)	0.083 (0.081)	-0.037 (0.081)	0.231*** (0.078)	0.217** (0.086)	0.043 (0.091)
Gini	0.074*** (0.008)	0.067*** (0.007)	0.074*** (0.008)	0.071*** (0.007)	0.074*** (0.008)	0.074*** (0.008)	0.072*** (0.008)	0.058*** (0.007)	0.069*** (0.009)	0.072*** (0.008)	0.088*** (0.009)
Infant mortality	-0.018 (0.019)	-0.020 (0.019)	-0.016 (0.019)	-0.018 (0.019)	-0.016 (0.019)	0.050*** (0.017)	0.050*** (0.017)	0.008 (0.021)	-0.015 (0.021)	-0.007 (0.020)	0.077*** (0.021)
ln(GDP15 pc)	-0.507*** (0.090)	-0.507*** (0.087)	-0.520*** (0.081)	-0.509*** (0.090)	-0.488*** (0.090)	-0.252*** (0.092)	-0.493*** (0.087)	-0.458*** (0.094)	-0.458*** (0.094)	-0.471*** (0.090)	-0.690*** (0.094)
Schooling	0.138*** (0.024)	0.139*** (0.023)	0.140*** (0.022)	0.140*** (0.023)	0.143*** (0.023)	0.120*** (0.023)	0.137*** (0.024)	0.126*** (0.026)	0.155*** (0.023)	0.155*** (0.023)	0.179*** (0.026)
Urbanization	0.015*** (0.002)	0.015*** (0.002)	0.015*** (0.002)	0.014*** (0.002)	0.016*** (0.002)	0.010*** (0.002)	0.015*** (0.002)	0.014*** (0.002)	0.018*** (0.002)	0.018*** (0.002)	0.011*** (0.003)
Young male	0.178*** (0.020)	0.184*** (0.020)	0.176*** (0.020)	0.180*** (0.019)	0.177*** (0.020)	0.180*** (0.018)	0.171*** (0.018)	0.201*** (0.020)	0.201*** (0.021)	0.102*** (0.019)	0.011*** (0.003)
Constant	-2.137*** (0.765)	-1.668*** (0.768)	-2.087*** (0.772)	-1.903** (0.798)	-2.488*** (0.685)	-1.722* (0.998)	-2.202*** (0.753)	-6.164*** (0.492)	-1.252 (0.894)	-1.341* (0.707)	0.238 (0.848)
Observations	452	452	452	452	452	570	452	452	452	452	452
R ²	0.606	0.600	0.606	0.606	0.605	0.524	0.606	0.570	0.563	0.575	0.504
Adjusted R ²	0.596	0.592	0.597	0.597	0.596	0.515	0.597	0.560	0.553	0.566	0.493
F Statistic	61.609*** (df = 11; 440)	73.584*** (df = 9; 442)	67.870*** (df = 10; 441)	67.704*** (df = 10; 441)	67.646*** (df = 10; 441)	61.426*** (df = 10; 559)	67.693*** (df = 10; 441)	58.369*** (df = 10; 441)	56.812*** (df = 10; 441)	59.718*** (df = 10; 441)	44.794*** (df = 10; 441)

*p<0.1; **p<0.05; ***p<0.01. Standard errors in parenthesis.

While for the regressions with all countries (Table 7.2), only the institutional variable of voice and accountability proved to be significant, for the developed countries, none of the institutional variables showed levels of statistical significance that were robust to the inclusion of controls. Probably because developed countries already have relatively high institutional scores that do not vary as much in comparing these countries.

Similar to the result for countries at all development levels, income inequality was a positive and significant predictor of homicide rates for developed countries. At the same time, infant mortality was insignificant, suggesting once again that relative poverty condition, rather than absolute poverty, would be significant in explaining homicides. For developed countries, GDP per capita negatively correlates with homicide rates and has robust significance to controls. Also, the population's average level of education is significant in explaining homicides; however, this association is positive. As observed by Fajnzylber et al. (2002), education can also positively affect violence since increases in average years of schooling may increase the loot seized through violence and reduce the costs of criminal activity by providing a variety of skills that can be used advantageously in the illegal market. Similar to the results found for all countries, urbanization and the percentage of young men in the population correlate positively with homicide rates in more industrially advanced societies.

As mentioned, the variables' semi-partial correlation (the difference between the adjusted R^2 of the complete model and the models in which the variables do not participate) shows their contribution to the explained variance of the complete model. The analysis of semi-partial correlations shows that, for developed economies, the percentage of men between 15 and 24 years old in the total population is the variable that presents the highest contribution to the explained variance of the model (semi-partial correlation of 17.28%), followed by income inequality (with a semi-partial correlation equal to 13.5%), education level (7.21%), GDP per capita (6%), urbanization (5.03%), and economic complexity (less than 1%).

The semi-partial correlations of the variables of voice and accountability, political stability, and infant mortality show that these variables capture information already

explained by other variables in the model and that the model would be slightly better specified without them. That is because the adjusted R^2 of the models in which the variables of voice and accountability (Column 3), political stability (Column 4), and infant mortality (Column 7) do not participate are individually higher than that of the entire model - adjusted R^2 of 0.597 for the models removing these variables versus an adjusted R^2 of 0.596 of the complete model.

Table 7.4 shows the results of the pooled OLS regression for developed countries between 2000-2019 without the variables that cannot explain the variations in homicides, namely voice and accountability, political stability, and infant mortality. Removing these variables affects the significance of the Economic Complexity Index as a predictor positively correlated with homicide rates in developed countries (Column 5). However, it does not affect the significance and sign of the squared term of the ECI, which remains a negative and significant homicide predictor.

Table 7.4: Pooled OLS regression models for 30 developed countries without the variables of low predictive power *Voice and accountability, Political stability and Infant mortality, 2000-2019*

Dependent variable: $\ln(\text{Homicide rate})$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ECI	0.506** (0.220)		0.466** (0.220)	0.285* (0.160)	0.373 (0.249)	0.578*** (0.215)	0.428** (0.216)	0.695*** (0.225)
ECI^2	-0.217** (0.093)		-0.192** (0.094)	-0.187*** (0.069)	-0.202** (0.101)	-0.203** (0.093)	-0.213** (0.090)	-0.325*** (0.100)
Corruption control	0.092 (0.058)	0.071 (0.060)		-0.157** (0.069)	-0.236*** (0.039)	0.148** (0.063)	0.200*** (0.058)	0.306*** (0.064)
Gini	0.070*** (0.007)	0.065*** (0.007)	0.067*** (0.006)		0.059*** (0.006)	0.066*** (0.008)	0.076*** (0.007)	0.090*** (0.008)
$\ln(\text{GDP15 pc})$	-0.500*** (0.077)	-0.497*** (0.075)	-0.423*** (0.048)	-0.295*** (0.082)		-0.522*** (0.082)	-0.457*** (0.077)	-0.741*** (0.084)
Schooling	0.141*** (0.021)	0.139*** (0.020)	0.144*** (0.022)	0.114*** (0.020)	0.146*** (0.024)		0.151*** (0.020)	0.187*** (0.025)
Urbanization	0.014*** (0.002)	0.014*** (0.002)	0.015*** (0.002)	0.014*** (0.002)	0.012*** (0.002)	0.016*** (0.002)		0.008*** (0.002)
Young male	0.172*** (0.018)	0.176*** (0.019)	0.179*** (0.018)	0.203*** (0.018)	0.200*** (0.019)	0.193*** (0.020)	0.154*** (0.018)	
Constant	-2.044*** (0.787)	-1.676** (0.771)	-2.837*** (0.521)	-1.470 (1.006)	-6.579*** (0.421)	-0.645 (0.870)	-1.548* (0.800)	1.676* (0.884)
Observations	452	452	455	570	452	452	452	452
R ²	0.605	0.599	0.604	0.506	0.560	0.555	0.573	0.469
Adjusted R ²	0.598	0.593	0.597	0.500	0.553	0.548	0.566	0.460
F Statistic	84.722*** (df = 8; 443)	110.573*** (df = 6; 445)	97.210*** (df = 7; 447)	82.149*** (df = 7; 562)	80.659*** (df = 7; 444)	78.999*** (df = 7; 444)	85.025*** (df = 7; 444)	55.918*** (df = 7; 444)

Note:

*p<0.1; **p<0.05; ***p<0.01. Standard errors in parenthesis.

This finding corroborates Durkheim's modernization perspective on homicides by showing that industrially developed countries have already managed to overcome the stages of the industrial process that are assumed to increase homicide rates and would now be experiencing the social pacification benefits of reaching higher levels of industrial sophistication. After removing the variables with low predictive power, the natural logarithm of GDP per capita maintained a negative and significant association with

homicides. At the same time, economic inequality, average years of schooling, urbanization, and the participation of men aged 15 to 24 preserved their significance and positive effects on homicides.

Table 7.5 shows pooled OLS regression models for 39 countries considered non-developed between 2000-2019. The table explores the effects of economic complexity, its quadratic term, and the institutional variables voice and accountability, political stability, and corruption control on homicide rates, also controlling for other socio-economic factors such as income inequality, infant mortality, the level of income, education, urbanization and the share of young men in the population. Column 1 includes all variables. Together, all variables explain 63% of the total variation in homicide rates among non-developed countries. Columns 2-11 exclude variables individually to explore the contribution of each to the complete model. Here, as in the regressions for all countries (Table 7.2), both the economic complexity index and its quadratic term exhibit a statistically significant association with homicide rates of countries; the former has a positive association with the variation of homicide rates, and its quadratic term a negative. This result suggests that for non-developed countries, as in the analysis for all countries together, the process of economic sophistication has a curvilinear relationship with homicide rates. That means that, as countries go through the industrialization process, they must experience an escalation of social disorder reflected in rising rates of lethal violence. However, the significant negative sign of the quadratic complexity term suggests that if these countries could achieve higher levels of sophistication in their productive structures, they would be able to pacify brutal acts of violence.

Table 7.5: Pooled OLS regression models for 39 non-developed countries during 2000-2019

	<i>Dependent variable: ln(Homicide rate)</i>										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
ECI	0.436*** (0.067)		0.437*** (0.067)	0.440*** (0.066)	0.437*** (0.073)	0.250*** (0.059)	0.489*** (0.066)	0.383*** (0.067)	0.464*** (0.068)	0.482*** (0.066)	0.212*** (0.068)
ECI ²	-0.462*** (0.065)		-0.462*** (0.065)	-0.458*** (0.061)	-0.462*** (0.066)	-0.440*** (0.042)	-0.494*** (0.067)	-0.494*** (0.065)	-0.438*** (0.066)	-0.453*** (0.065)	-0.386*** (0.071)
Voice accountability	-0.045 (0.070)	-0.045 (0.069)		-0.034 (0.071)	-0.381*** (0.061)	0.695*** (0.049)	-0.057 (0.071)	-0.030 (0.070)	-0.086 (0.071)	-0.021 (0.072)	-0.066 (0.066)
Political stability	-0.018 (0.055)	0.012 (0.062)	-0.024 (0.055)	-0.034 (0.069)	-0.034 (0.069)	-0.018 (0.059)	-0.005 (0.057)	-0.066 (0.053)	0.071 (0.053)	-0.012 (0.059)	0.028 (0.059)
Corruption control	-0.508*** (0.073)	-0.509*** (0.070)	-0.614*** (0.056)	-0.509*** (0.072)	0.045*** (0.068)	-1.017*** (0.055)	-0.532*** (0.074)	-0.636*** (0.072)	-0.542*** (0.075)	-0.557*** (0.070)	-0.675*** (0.069)
Gini	0.038*** (0.007)	0.040*** (0.007)	0.037*** (0.008)	0.039*** (0.006)	0.045*** (0.008)		0.033*** (0.008)	0.030*** (0.007)	0.062*** (0.006)	0.042*** (0.007)	0.046*** (0.008)
Infant mortality	-0.026*** (0.005)	-0.030*** (0.005)	-0.026*** (0.005)	-0.026*** (0.005)	-0.021*** (0.005)	-0.069* (0.005)		-0.023*** (0.005)	-0.024*** (0.005)	-0.028*** (0.005)	-0.019*** (0.005)
ln(GDP15 pc)	-0.231*** (0.061)	-0.237*** (0.063)	-0.231*** (0.061)	-0.238*** (0.059)	-0.327*** (0.067)	0.250*** (0.064)	-0.122** (0.061)		-0.388*** (0.062)	-0.113* (0.058)	-0.238*** (0.070)
Schooling	-0.143*** (0.029)	-0.140*** (0.032)	-0.144*** (0.030)	-0.141*** (0.027)	-0.120*** (0.034)	-0.134*** (0.018)	-0.134*** (0.032)	-0.169*** (0.029)		-0.131*** (0.029)	-0.177*** (0.035)
Urbanization	0.013*** (0.003)	0.014*** (0.003)	0.013*** (0.003)	0.013*** (0.003)	0.010*** (0.003)	0.008*** (0.003)	0.041*** (0.003)	0.010*** (0.003)	0.011*** (0.003)	0.168*** (0.022)	0.016*** (0.003)
Young male	0.154*** (0.019)	0.109*** (0.020)	0.157*** (0.020)	0.154*** (0.019)	0.174*** (0.021)	0.144*** (0.020)	0.130*** (0.020)	0.155*** (0.019)	0.175*** (0.022)	0.168*** (0.022)	
Constant	0.749 (0.602)	1.374** (0.638)	0.701 (0.616)	0.766 (0.607)	1.005 (0.638)	-1.890*** (0.635)	-0.422 (0.571)	-0.545 (0.532)	-0.461 (0.548)	0.078 (0.632)	3.170*** (0.613)
Observations	458	458	458	458	458	734	458	458	458	458	458
R ²	0.647	0.592	0.647	0.647	0.594	0.509	0.616	0.639	0.617	0.630	0.594
Adjusted R ²	0.638	0.584	0.639	0.639	0.585	0.503	0.608	0.631	0.608	0.622	0.585
F Statistic	74.243*** (df = 11; 446)	72.165*** (df = 9; 448)	81.809*** (df = 10; 447)	81.818*** (df = 10; 447)	65.296*** (df = 10; 447)	75.098*** (df = 10; 447)	71.802*** (df = 10; 447)	79.008*** (df = 10; 447)	71.910*** (df = 10; 447)	76.104*** (df = 10; 447)	65.325*** (df = 10; 447)

*p<0.1; **p<0.05; ***p<0.01. Standard errors in parenthesis.

Although the variables of voice and accountability and political stability did not show statistical significance, the institutional variable of corruption control turns out to be a negative and statistically significant predictor of homicide rates for non-developed countries. This robust association between corruption and homicide rates in non-developed countries contrasts with the previous results obtained for all countries and developed countries, in which corruption could not explain the variance of violence. That shows how, in non-developed countries, the capture of the state by private interests reflected in high levels of corruption is closely related to the manifestation of lethal violence in these countries.

The log GDP per capita exhibits a significant association with homicide rates, but its sign is not robust to controls. In Column 6, removing income inequality from the model makes GDP per capita a positive and significant predictor of homicide rates, even though GDP is negatively related to homicides in the other models. These results suggest a multicollinearity problem between income inequality and GDP per capita. Rather than exclude one of these two variables from the model to deal with this problem, we chose to keep both inequality and income as explanatory variables, as operationalized in the regressions for all countries together. This is because the omission of inequality or GDP per capita from the model would lead to a misspecification problem, which is even more serious than the multicollinearity problem.

The direction of the impact of the average level of schooling in non-developed countries differs from that observed in developed ones. In non-developed countries, the increase in the population's years of schooling can negatively impact homicide rates. Poverty, as measured by the infant mortality rate, also exhibits a negative association with homicides, suggesting that absolute poverty cannot be considered a condition that increases episodes of violence in these countries. Income inequality, urbanization, and the percentage of young men aged 15-24 in the total population are significant factors that positively impact homicide rates in non-developed countries, as they were for developed countries and all countries together.

The analysis of semi-partial correlations shows that the adjusted R^2 of the models in which the variables of voice and accountability (Column 3) and political stability (Column 4) do not participate are individually superior to the complete model – R^2 adjusted for 0.639 for models that remove these variables against an adjusted R^2 of 0.638 for the complete model. That indicates that the voice and accountability and political stability variables capture information already explained by the other variables in the model and that the model could be better specified without these variables.

Table 7.6 shows the results of the pooled OLS regression for non-developed countries between 2000-2019 without the variables of low predictive power, namely, voice and accountability and political stability. The Economic Complexity Index (ECI) remains a positive and significant predictor of homicide rates, although, in Column 4, it is significant at only 10%. Its squared term shows a negative and significant association with homicide rates. Likewise, the control of corruption maintains a negative and significant relationship with homicides in all models.

Table 7.6: Pooled OLS regression models for 39 non-developed countries without the variables of low predictive power *Voice and accountability* and *Political stability*, during 2000-2019

Dependent variable: $\ln(\text{Homicide rate})$									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ECI	0.444*** (0.066)		0.509*** (0.070)	0.124* (0.069)	0.496*** (0.066)	0.399*** (0.065)	0.455*** (0.070)	0.487*** (0.067)	0.209*** (0.067)
ECI^2	-0.456*** (0.061)		-0.425*** (0.054)	-0.543*** (0.050)	-0.491*** (0.061)	-0.479*** (0.061)	-0.452*** (0.062)	-0.449*** (0.060)	-0.390*** (0.068)
Corruption control	-0.629*** (0.054)	-0.624*** (0.048)		-0.707*** (0.051)	-0.568*** (0.050)	-0.678*** (0.051)	-0.574*** (0.058)	-0.573*** (0.054)	-0.709*** (0.055)
Gini	0.038*** (0.007)	0.038*** (0.007)	0.034*** (0.007)		0.031*** (0.007)	0.031*** (0.007)	0.058*** (0.004)	0.042*** (0.007)	0.043*** (0.007)
Infant mortality	-0.026*** (0.005)	-0.030*** (0.005)	-0.020*** (0.005)	-0.007 (0.005)		-0.022*** (0.005)	-0.025*** (0.005)	-0.028*** (0.005)	-0.019*** (0.005)
$\ln(\text{GDP15 pc})$	-0.241*** (0.060)	-0.236*** (0.065)	-0.441*** (0.070)	0.496*** (0.073)	-0.128** (0.058)		-0.376** (0.063)	-0.120** (0.052)	-0.233*** (0.068)
Schooling	-0.142*** (0.027)	-0.142*** (0.030)	-0.119*** (0.029)	-0.156*** (0.022)	-0.135*** (0.030)	-0.165*** (0.028)		-0.130*** (0.027)	-0.182*** (0.031)
Urbanization	0.012*** (0.003)	0.013*** (0.003)	0.007** (0.003)	0.006** (0.003)	0.014*** (0.003)	0.009*** (0.003)	0.010*** (0.003)		0.016*** (0.003)
Young male	0.154*** (0.019)	0.109*** (0.019)	0.192*** (0.022)	0.134*** (0.023)	0.130*** (0.019)	0.153*** (0.020)	0.180*** (0.022)	0.168*** (0.021)	
Constant	0.827 (0.629)	1.438** (0.656)	2.286*** (0.675)	-3.433*** (0.773)	-0.018 (0.599)		-0.558 (0.549)	-0.504 (0.520)	3.282*** (0.642)
Observations	458	458	477	734	458	458	458	458	458
R^2	0.647	0.591	0.552	0.413	0.616	0.637	0.615	0.630	0.593
Adjusted R^2	0.639	0.585	0.544	0.406	0.609	0.631	0.608	0.623	0.586
F Statistic	91.039*** (df = 9; 448)	93.078*** (df = 7; 450)	72.119*** (df = 8; 468)	63.738*** (df = 8; 725)	89.941*** (df = 8; 449)	98.514*** (df = 8; 449)	89.483*** (df = 8; 449)	95.499*** (df = 8; 449)	81.769*** (df = 8; 449)

Note:

*p<0.1; **p<0.05; ***p<0.01. Standard errors in parenthesis.

Also, in these pooled OLS regressions, the log GDP per capita, despite being significant, has its sign affected by the controls, suggesting a multicollinearity problem. As with the regressions for all countries together, here it was decided to keep both variables in the model to avoid misspecification problems. While inequality, urbanization, and the proportion of young men are positively related to homicide rates, schooling correlates

negatively with rates of lethal violence in these countries – all statistically significant variables.

8 Concluding Remarks

The dynamics of violence are not sustained exclusively by economic deprivation, economic decline, or lack of education. Violence is also a manifestation of interactions between institutions and economic structures that continue to reproduce modified forms of violence as far back as the colonial era.

We have found that where the state abdicates the monopoly of the legitimate use of violence on behalf of private interests, institutions are unable to fully coordinate the path to security and justice. Consequently, homicide rates may increase. In addition to institutional aspects, we find that violence is linked to economic structures. Elaborating on Durkheim's central contribution to the growth of social organization due to the emergence of the industrial division of labor, we found that economic specialization aimed at the sophistication of social and economic tasks may contribute to forming new collective interests that would favor a decrease in homicides rates.

The statistical connection between violence, institutions, and economic complexity is explored using pooled OLS regression for 69 countries from 2000 to 2019. The Economic Complexity Index (ECI) developed by [Hidalgo & Hausmann \(2009\)](#) is used to analyze how the advance of specialized activities in modern industrial societies is related to variations in rates of homicides. The results suggest that the waves of structural change over the last two decades are closely related to the trajectories of lethal violence between countries. In order to investigate how the specialization of social and productive tasks affects lethal violence in societies with different degrees of development, the empirical analysis was carried out first taking into account all 69 countries simultaneously (Table 7.2). Then, the analysis was done only for the subset of 30 developed countries (Table 7.3 and 7.4), and finally, only for the subset of 39 non-developed countries (Table 7.5 and 7.6). We found that the effects of the ECI on homicides are robust to controls and the different classifications of countries according to levels of development.

The quadratic term of the ECI was included in the analysis to consider whether the ECI could impact violence in a non-linear way. Multivariate regression results show that the shape of the relationship between homicide rates and ECI depends on the stage of development in which societies find themselves. In the analysis that included all countries simultaneously (Table 7.2) and the one that included only non-developed countries (Tables 7.5 and 7.6), we found that both ECI and its squared term are significant predictors of homicide rates. This result suggests that, in these countries, the complexity of the division of productive activities would first raise and then decrease homicide rates, describing an inverted U-shaped relationship between economic complexity and lethal violence between all countries and non-developed countries. The nonlinearity of the relationship between economic complexity and homicide rates corroborates hypothesis 2 raised in this study and is in line with the predictions from the modernization perspective regarding the behavior of lethal violence throughout the process of modernization of society (Durkheim & Halls, 1984 [1893]).

The results for developed countries partly differ from those observed for all countries as a whole and non-developed countries. That is because the results of the pooled OLS regression for developed economies (Tables 7.3 and 7.4) do not show evidence that the ascending part of the curve that relates homicides-ECI is operating in the sense of increasing homicides in these economies. That is because, for developed countries, the positive association of the ECI was not significant in all models. However, the quadratic term of the ECI is negatively and statistically related to homicide rates for these countries in all models. This finding suggests that during 2000-2019, there is no evidence of stages of the structural sophistication process in developed countries responsible for pushing lethal violence upwards. Of course, industrially developed economies have already managed to overcome the initial stages of structural change that are assumed to increase homicide rates and would now be experiencing the violence-pacification benefits of achieving higher levels of complexity.

Among the institutional variables analyzed, the variable of voice and accountability and control of corruption are the only ones that showed statistical significance. Their effects,

nonetheless, are different when we analyze the different groups of countries. Corruption control is closely related to the variation in homicide rates in non-developed countries but not in developed ones. For the former, controlling corruption negatively and significantly affects homicide rates. Results for all countries suggest that democratic citizen participation plays a role in explaining cross-national variations in homicides, although future research should examine the direction of this impact further. In developed countries, none of the institutional variables showed levels of statistical significance that were robust to the inclusion of controls. Probably because developed countries already have relatively high institutional scores that do not vary as much when comparing this group of countries.

The findings, therefore, do not support the hypothesis that state complicity is a predictor of homicide rates in all countries. This hypothesis, however, is supported for non-developed countries. For non-developed countries, control of state capture for private gain (measured by the corruption control variable) is significantly related to lethal violence.

Another divergence in the results when we disaggregate the empirical analysis between groups of countries is the relationship that average years of schooling have on violence. While for non-developed countries, adding years of schooling is expected to decrease homicide rates, in developed countries, education exhibits a positive correlation with homicide rates. The positive effect of average years of schooling in developed nations cancels the negative effect of schooling in homicides for non-developed countries such that, when the analysis is carried out for all 69 countries together, education does not seem to explain variability in homicide rates. For all countries, at all levels of development, inequality, urbanization, and the share of young men aged 15-24 showed a positive association with homicide rates.

An important implication of the results presented here is that an increase in lethal violent acts is expected for non-developed countries as they reach intermediate levels of economic complexity. In non-developed countries, the positive impact of the ECI on homicides in terms of the magnitude of its estimated β coefficient is more significant than the deleterious effects that inequality, urbanization, and age composition combined have

on homicide rates. When added to the positive effects that income inequality, urbanization, and the share of male youth population also have on homicides in non-developed nations, this puts further upward pressure on violence in these countries. In conclusion, non-developed countries are still experiencing the social losses associated with the intermediate levels of the industrialization process (a stage that developed countries have already overcome).

One way out of the rise in homicide rates in non-developed countries lies within the industrialization process itself. The evidence from the present study suggests that the increase in lethal violence would tend to be attenuated in the later stages of the industrial sophistication process. If countries can advance further in the sophistication of their social and productive tasks, they should begin to experience the benefits of pacifying violence from greater interdependence in social and productive relationships. The results suggest that as specialized activities advance and countries reach higher levels of complexity (here represented by the quadratic term of the economic complexity index), episodes of violence that end human lives become less frequent. Following Durkheim's central thesis in the *Division of Labor* (1984 [1893]), where the economic specialization is very complex and where there is a great deal of diversity in societal tasks, the growing interdependence between individuals may change social interests toward greater solidarity and make societies less likely to accept acts that might disrupt themselves.

Nevertheless, until the most advanced stages of diversification and specialization of productive tasks arrive, non-developed countries must find ways to create a counterweight to the social and economic forces that press lethal violence upward. Some factors can help non-developed countries to come out of the bloodshed. Schooling is one of them. The results show that increasing the population's average education level can reduce homicide rates. However, the increase in schooling alone will not be able to contain the combined effects of the impacts of the intermediate stages of productive specialization, combined with inequality and other structural variables that increase violence. That is what the coefficient of the schooling variable shows us, which, although negative and significant, is of insufficient magnitude to contain the various forces that increase homicide rates.

The control of the capture of the state by private interests and the reduction of the extent to which public power is exerted for personal gain, expressed by the control of corruption, is another significant factor that can add to the advances in economic complexity and schooling as a means of contributing to the de-escalation of homicides in the world's most violent countries. The magnitude of the corruption control coefficient places this variable as a key element for understanding homicide rates in non-developed economies. Countries in which the state is not complicit with violence can provide an institutional framework that does not encourage the use of violence as a tool to protect private interests.

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APPENDIX A – TABLES

Table A.1: Classification of countries by level of development

Developed Countries	Non-developed Countries
Australia	Argentina
Austria	Azerbaijan
Belgium	Belarus
Bulgaria	Bolivia (Plurinational State of)
Canada	Brazil
Croatia	Chile
Denmark	Colombia
Estonia	Costa Rica
Finland	Dominican Republic
France	Ecuador
Germany	El Salvador
Greece	Georgia
Hungary	Guatemala
Ireland	Honduras
Italy	Israel
Japan	Jamaica
Latvia	Jordan
Lithuania	Kazakhstan
Netherlands	Kenya
New Zealand	Mauritius
Norway	Mexico
Poland	Mongolia
Portugal	Morocco
Romania	Nicaragua
Slovakia	Panama
Slovenia	Paraguay
Spain	Peru
Sweden	Republic of Korea
Switzerland	Republic of Moldova
United States of America	Russian Federation
	Serbia
	Singapore
	Syrian Arab Republic
	Thailand
	The former Yugoslav Republic of Macedonia
	Trinidad and Tobago
	Uganda
	Ukraine
	Uruguay

Source: Elaborated by the author.

Notes: List of 69 countries included in the empirical analysis according to the United Nations development classification. The United Nations classifies all countries in the world into three major groups: developed economies, developing economies, and economies in transition. For the empirical analysis, countries were grouped into two categories: developed and non-developed (which includes developing economies and economies in transition). Further information about how the United Nations classifies countries can be found at https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2022__ANNEX.pdf.

Table A.2: Descriptive summary statistics for all countries

Variable	Mean	Standard Deviation	Minimum	Median	Maximum	Obs. Valid	Pct. Obs. Valid
ln(Homicide rate)	1,37	1,32	-1,56	1,14	4,59	1379	99,93
ECI	0,56	0,86	-1,32	0,55	2,48	1374	99,57
ECI^2	1,05	1,23	0,00	0,56	6,16	1380	100,00
Voice and accountability	0,47	0,84	-1,99	0,57	1,80	1311	95,00
Political stability	0,20	0,82	-2,97	0,30	1,76	1311	95,00
Corruption control	0,37	1,07	-1,69	0,12	2,47	1311	95,00
Gini	37,54	8,89	23,20	35,40	61,60	933	67,61
Infant mortality	12,33	11,52	1,80	7,90	87,10	1380	100,00
ln(GDP15 pc)	9,26	1,15	6,25	9,23	11,39	1379	99,93
Schooling	9,90	2,40	3,40	10,40	14,20	1380	100,00
Urbanization	68,16	16,31	14,79	68,23	100,00	1380	100,00
Young male	16,18	3,29	9,90	16,05	23,50	1380	100,00

Source: Elaborated by the author.

Notes: Descriptive summary statistics in this table include 69 countries at all development levels and all macro indicators used. The mean, standard deviation, minimum, median, maximum, number, and percentage of valid observations are shown.

Table A.3: Descriptive summary statistics for developed countries

Variable	Mean	Standard Deviation	Minimum	Median	Maximum	Obs. Valid	Pct. Obs. Valid
ln(Homicide rate)	0,38	0,75	-1,56	0,23	2,74	600	100,00
ECI	1,20	0,57	-0,16	1,24	2,48	600	100,00
ECI^2	1,77	1,39	0,00	1,55	6,16	600	100,00
Voice and accountability	1,17	0,35	0,22	1,18	1,80	570	95,00
Political stability	0,82	0,41	-0,47	0,89	1,76	570	95,00
Corruption control	1,20	0,83	-0,49	1,35	2,47	570	95,00
Gini	31,92	4,09	23,20	32,30	41,50	455	75,83
Infant mortality	4,61	2,35	1,80	4,00	18,10	600	100,00
ln(GDP15 pc)	10,19	0,71	8,22	10,44	11,39	600	100,00
Schooling	11,52	1,33	6,80	11,80	14,20	600	100,00
Urbanization	73,05	12,02	50,75	74,03	98,04	600	100,00
Male population (age 15-24)	13,39	1,83	9,90	13,05	18,40	600	100,00

Source: Elaborated by the author.

Notes: Descriptive summary statistics in this table include 30 developed countries and all macro indicators used in the empirical analyses. The mean, standard deviation, minimum, median, maximum, number, and percentage of valid observations are shown.

Table A.4: Descriptive summary statistics for non-developed countries

Variable	Mean	Standard Deviation	Minimum	Median	Maximum	Obs. Valid	Pct. Obs. Valid
ln(Homicide rate)	2,13	1,15	-1,39	2,12	4,59	779	99,87
ECI	0,07	0,71	-1,32	-0,06	1,98	774	99,23
ECI^2	0,50	0,71	0,00	0,23	3,91	780	100,00
Voice and accountability	-0,07	0,69	-1,99	-0,03	1,29	741	95,00
Political stability	-0,28	0,73	-2,97	-0,30	1,62	741	95,00
Corruption control	-0,27	0,75	-1,69	-0,41	2,33	741	95,00
Gini	42,89	8,93	24,00	43,45	61,60	478	61,28
Infant mortality	18,27	12,23	2,00	15,75	87,10	780	100,00
ln(GDP15 pc)	8,55	0,89	6,25	8,52	11,02	779	99,87
Schooling	8,66	2,29	3,40	8,70	13,10	780	100,00
Urbanization	64,39	18,09	14,79	62,53	100,00	780	100,00
Male population (age 15-24)	18,33	2,44	11,80	18,85	23,50	780	100,00

Source: Elaborated by the author.

Notes: Descriptive summary statistics in this table include 39 non-developed countries and all macro indicators used in the empirical analyses. The mean, standard deviation, minimum, median, maximum, number, and percentage of valid observations are shown.