

Does globalization reduce personal violence?

# Does Globalization Reduce Personal Violence? The Impact of International Trade on Cross-National Homicide Rates

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While interest in globalization has continued to increase, few researchers have linked it to crime rates. However, if globalization has the characteristics suggested by either its supporters or detractors, it likely has a significant effect on cross-national violent crime rates. Supporters of the *doux commerce* (gentle commerce) thesis argue that increasing international trade decreases all types of violence, including homicide, by providing individuals with a rational interest in engaging peacefully with others, offering opportunities for cross border commerce and travel, and encouraging greater understanding of diverse cultures. By contrast, detractors argue that as globalization increases, inequality and poverty separate the economic well-being of highly industrialized core nations from that of developing peripheral nations and as this gap intensifies, it leads to crime increases. We also consider the possibility that the effects of trade globalization are either too small or too macro-level to significantly affect violent crime rates. Based on these competing arguments we examine whether homicide rates are significantly lower for countries with high levels of globalization, compared to countries with low globalization levels. We assemble a homicide database of 2145 observations over five decades, control for a wide range of alternative explanations, and test for an interaction between globalization and GDP. Consistent with the *doux-commerce* argument, we find that rising globalization has resulted in lower cross-national homicide rates during the past half century and that these declines are greatest for low GDP-high inequality countries. We consider the implications for theory, future research and policy.

Globalization through increasing worldwide trade is arguably one of the most important economic developments in the past half century, but its impact on human behavior is widely disputed. It has been criticized for taking jobs from some segments of the labor market, intensifying competition between workers, and increasing within-country inequality (Kanbur 2015; Wade 2004). By contrast, globalization supporters (Ghemawat 2017; Giovanni and Levchenko 2009; Wolf 2000) argue that it strengthens social networks and encourages

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efficient labor specialization, increases worldwide prosperity and reduces country-level income inequality. While interest in globalization has continued to grow, with few exceptions (Levchak 2015) researchers have rarely linked it to crime rates. However, prior theorizing about globalization suggests that it encourages changes in human behavior that could reasonably be expected to affect crime rates.

The idea that increased trade calms exchanges between individuals can be traced back to antiquity but is especially associated with the scholars of the Enlightenment (Pomeranz and Topik 2017). Montesquieu, Voltaire, Smith and Hume were all supporters of the “*doux commerce*” (i.e., gentle commerce) thesis, that the spread of trade and commerce decreases all types of violence, including homicide and other violent crime (Dickey 2001; Movsesian 2017). While Enlightenment philosophers considered the social benefits of *doux commerce* in general, Elias (1939) argued specifically that violent crime declines along with the self-restraint imposed by increasingly complex social networks driven by trade. More recently, Hirschman (1997) revived the *doux-commerce* thesis and claimed that increasing trade is a powerful moralizing agent capable of bringing important nonmaterial benefits to society. While varying in terms of specific emphasis, these theoretical traditions all lead us to expect that growing trade globalization will reduce violent crime.

But not all experts share this view. For example, Marx (1972) famously claimed that commerce and trade erode traditional values and institutions and as social bonds are weakened, interpersonal violence increases. Similarly, Sassen (2018, 2290) argues that increased inequality in earnings and in profit-making abilities among firms has relegated large segments of the population of developing countries to low paying informal economies. This theme is also picked up by advocates of various conflict perspectives (Hsieh and Pugh 1993; Wade 2004) who argue that as globalization intensifies, rising rates of poverty, economic inequality, and unemployment increasingly separate highly industrialized core nations from developing peripheral nations, exacerbate the economic gap between the industrial “haves” and industrializing “have nots” and lead to increases in crime.

There is also support for the conclusion that trade globalization will have no connection to cross-national homicide rates. Supporters of the *doux commerce* perspective like Elias and Hirschman argue that all trade and commerce have a civilizing influence on human behavior and do not focus on international trade. To the extent that the effects of trade globalization are too small, or too macro-level to influence micro-level behavior like violent crime, globalization may have no significant effect on cross-national homicide rates.

While the putative effects of globalization are closely related to sharply contrasting perspectives on crime, we could find few cross-national tests. Moreover, prior research on cross-national comparative crime has often been limited by small, unrepresentative samples. In response, our goal in this analysis is to test the effects of trade globalization on cross-national homicide rates with the most inclusive data base possible both in terms of total countries included and number of years analyzed. We rely on homicide data because they are

generally recognized to be the most valid measure of cross-national crime (Aebi 2010; Eisner 2008; LaFree 1999) and assemble a homicide database with 78 countries over more than five decades (1960–2013). We operationalize globalization as trade openness, the measure most frequently used by economists (Rodrik 1999; Yanikkaya 2003). We control for common rival explanations, test for interaction between globalization and GDP per capita and perform several post estimation robustness tests.

Our paper proceeds in five sections. First, we review the theoretical arguments in support of positive, negative and null effects of trade globalization on crime. Second, we examine trends in globalization and crime over the past half century. Third, we describe the data, variables and methods used to test for a connection between our measure of globalization and cross-national homicide rates. Fourth, we discuss the results of our analyses. Finally, we conclude with the implications of the paper for theory, future research and social policy.

## Globalization and Crime

Albrow and King (1990, 9) define globalization as “all those processes by which the people of the world are incorporated into a single world society” and Giddens (2013, 64) adds that globalization is “the intensification of worldwide social relations, which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa.” Although globalization also encompasses political, social and cultural connections across borders (Waters 2001), in this research we focus on economic globalization, in particular the development of an increasingly integrated global economic system characterized by free trade and the flow of capital.

We conceptualize globalization along a continuum where one extreme represents economic relations and networks organized exclusively at the local level and the other is characterized by extensive global networks and transactions. O’Rourke and Williamson (2002) argue that large-scale globalization did not get under way until the 1820s and its rapid rise did not begin until much more recently. Oneal, Russett and Berbaum (2003) show that average trade levels in 1965 were only slightly higher than they were in 1885. However, international trade skyrocketed afterwards, increasing eight-fold in total value between 1965 and 2000 alone (Gleditsch 2002).

### **Globalization and Violent Crime**

We contend that globalization may be expected to reduce country-level crime rates through at least five mechanisms. First, increased trade through globalization makes criminal behavior less rational and costlier. Montesquieu made it clear that the positive developments in human behavior that result from trade are not necessarily because humans are made better by increasing commerce and trade but rather because these developments make it more rational for individuals to behave in a civil manner: “It is fortunate for me to be in a

situation where, though their passions may prompt them to be wicked, they have nevertheless an interest in not being so” (in [Hirschman 1997](#), xxii). Elias invokes a similar argument about rational behavior in his description of how violent behavior declined in Europe as it moved away from feudalism. The economic base of the European feudal system was land and the peasants who farmed it. In such closed systems (land is a fixed commodity), the only rational way for individuals to improve their economic prospects was to conquer their neighbors and seize their land. Elias argues that as Europeans gradually freed themselves from the feudal system, trade and commerce increased and individuals had fewer incentives to engage in violent behavior. While Elias is referring here to a much earlier period, the underlying logic holds: greater trade with diverse societies increases individuals’ rational interest in engaging peacefully with others. The potential loss of economic benefits due to criminal behavior serves as a check on criminal violence in countries experiencing growing economic benefits.

Second, globalization reduces criminal behavior by further centralizing the power of the state. [Elias \(1939, 185\)](#) argues that the consolidation of political power gives states an increasing monopoly over the use of violence. As the state’s control over the use of violence becomes stronger, it reduces the tendency for individuals to take the law into their own hands. [Black \(1983\)](#) refers to such behavior as “self-help” and argues that most of what we call crime is from the point of view of the perpetrator, the pursuit of justice. [Cooney \(1997\)](#) argues that members of lower-status groups—the poor, the uneducated, the unmarried, members of minority groups—may sometimes operate as if they are stateless. Thus, lower-status individuals are more likely than others to reject the formal legal system and instead take responsibility for their safety into their own hands ([Kirk and Papachristos 2011](#); [Kubrin and Weitzer 2003a](#)). In an extensive review of research from criminology, anthropology and history, [Eisner \(2003, 158\)](#) concludes that the existence of an accepted governmental authority “which organizes power and delivers justice” is reliably associated with lower levels of interpersonal violence. To the extent that growing international trade supports a strong centralized government the state monopoly on violence should discourage vigilantism and reduce violent interpersonal crime.

Third, globalization creates increasing trade surpluses that may be used in part to improve the quality of the criminal justice system and thereby reduce criminal behavior. Openness to trade enables allocation of production factors to their most efficient uses, promoting development, which strengthens the government, providing it with more revenue as the tax base grows. Richer states, in turn, have the resources to support stronger police and legal systems, deterring potential criminals. Richer countries can also afford better infrastructure and administrative capacity, further strengthening security.

Fourth, researchers have long argued that increased trade globalization can have a “civilizing” effect on human interactions. For example, [Montesquieu \(1748, 8\)](#) famously wrote that “wherever the ways of man are gentle, there is commerce; and wherever there is commerce, there the ways of men are gentle.” American political activist [Thomas Paine \(2011, 215\)](#) argued that “[Commerce] is a pacific system, operating to cordialize mankind, by rendering Nations, as well

as individuals, useful to each other.” Indeed, proponents of the *doux commerce* view argue that increased trade and commerce encourage individuals to be more reasonable and prudent and less influenced by extreme beliefs, especially due to religion (Dickey 2001; Movsesian 2017). This emphasis on the civilizing effect of commerce and trade is closely related to Elias’s (1939, 2000) argument that violent crime in Western Europe declined drastically over the past half millennium as traditional standards regarding violence were gradually civilized through self-restraint imposed by increasingly complex social networks.

Finally, Hirschman (1982, 1483) argues that trade and commerce generate feelings of trust and empathy for others. Greater trade not only produces considerable new wealth and technical progress but also encourages an honest and disciplined citizenry that is disposed to finding solutions to conflicts and willing to negotiate rather than resort to violence. Hirschman (1997) makes it clear that greater commerce has a transformative effect not only on “the characteristics of statecraft,” but also on “the character of citizens” and argues (Hirschman 1982, 1466) that increasing trade encourages citizens to be fair and truthful in their dealings with others. Globalization can also be expected to encourage immigration and travel across national boundaries. Increasing contact with other societies provides chances for greater understanding of these cultures and offers more opportunities to see common aspirations and problems. More recently, similar reasoning was adopted in a review by Pinker (2011), who builds a comprehensive argument about world-wide declines in violence (see also, Karstedt 2015; Karstedt and Nelken 2013).

### **Arguments Against Globalization Reducing Homicide**

However, not all commentators agree about the positive potential of globalization for reducing criminal behavior. Contemporary proponents of various conflict perspectives (Lee and Bankston 1999; Fajnzylber, Lederman, and Loayza 1998) argue that globalization fuels rising rates of inequality, poverty and unemployment and that these outcomes increasingly separate highly industrialized core nations from developing peripheral nations (Wade 2004; Wallerstein 1979). Core nations prosper in this system by extracting raw materials and cheap labor from peripheral nations (Sassen 2018). As the economic gap between industrial and developing countries widens, poverty, slums, and unemployment become more common among the latter. According to economic stress perspectives, increasing globalization creates a growing population of unemployed and underemployed workers (Wagner 2013), relegated to poverty. The global system also constrains urban development and peripheral countries suffer increasingly from a shortage of decent housing and living wages, all of which drive crime rates up.

While few studies have measured globalization directly, a large number of studies have included measures of income inequality (LaFree and Drass 1996; Pridemore 2008; Savolainen 2000; Stamatel 2009); poverty (Messner, Raffalovich, and Sutton 2010; Pare and Felson 2014); and unemployment (Neapolitan 1997; Sun, Chu, and Sung 2011). Past research over several

decades supports the conclusion that country-level income inequality (usually measured as the GINI index) is associated with high homicide rates (Messner and Rosenfeld 1997; Stamatel 2009; but see Pare and Felson 2014). Results are less clear for unemployment, with some studies finding a positive relationship with homicide (Lim, Bond, and Bond 2005; Sun 2006) and others finding no connection (Neapolitan 1998; Sun, Sung, and Chu 2007).

But while there is evidence suggesting that economic inequality and poverty are associated with high rates of homicide, the connection between globalization and these measures is less clear. In fact, researchers are deeply divided in terms of whether globalization has increased or reduced worldwide inequality and poverty. One side (Bergh and Nilsson 2014; Dollar and Kraay 2002) contends that the distribution of income between all the world's people has become more equal over the past two decades and the number of people living in extreme poverty has fallen for the first time in more than a century and a half. Globalization supporters argue that these trends are due in large part to the rising density of economic integration between countries, which has made for increased efficiency of resource use worldwide as countries and regions specialize in line with their comparative advantage. Held et al. (2000) and others (Barbieri and Reuveny 2005; Reuveny and Li 2003) argue that globalization reduces income inequality by improving the economic conditions of lesser developed countries (LDCs). LDCs are disadvantaged in the world economy because they are relatively more endowed with labor, while more highly developed countries (HDCs) are relatively more endowed with capital. Globalization supporters argue that international trade promotes equality by reducing the earnings of capital in HDCs and raising the earnings of labor in LDCs.

By contrast, critics of globalization (Bourguignon 2017; Kaplinsky 2013) argue that world poverty and within-country inequality have been rising due to forces unleashed by globalization. For example, Wade (2004) points out that inequality in pay rates within manufacturing has become steadily greater since the early 1980s and absolute income gaps are rapidly widening. In this study we propose a direct test of these conflicting arguments about the impact of globalization on violent crime by examining country-level homicide rates starting in the early 1960s—the period when trade globalization began to accelerate rapidly.

## Data and Measures

We analyzed a total of 2145 cases for 78 countries from 1960 to 2013 where full information was available. For a list of country-years from which the data were drawn see the online supplementary material for [table S1](#).

### ***Dependent Variables—Homicide Rates***

Our measure of cross-national homicide rates is from the World Health Organization Mortality Data Base (WHO). The definition of homicide from

**Table 1. Descriptive Statistics for Homicide, Globalization and Control Variables**

Variable	Mean	SD	Min	Max
<b>Dependent variable</b>				
Log homicide rate	1.032	1.349	-2.669	5.558
<b>Independent variable</b>				
Globalization	0.652	0.625	0.000	6.020
<b>Controls</b>				
GDP per capita	1.966	1.883	0.037	11.321
Low labor share of income	0.454	0.099	0.186	0.850
Income inequality	35.452	8.918	19.900	59.000
Human capital	2.714	0.539	1.226	3.726
Percent youth	0.241	0.037	0.149	0.347
Percent urban	0.671	0.191	0.085	1
Population	29.563	47.393	0.251	315.537

WHO (2014) vital statistics is “the killing of a person by another with intent to cause death or serious injury.” Because WHO data are based on the same coding rules for the cause of death among all countries and because compared to legal systems, medical systems are presumably under less pressure to under or over report crime, many researchers consider the WHO data to be the “gold standard” for cross-national homicide estimates (Aebi 2010; LaFree 2005; Lappi-Seppälä and Tonry 2011).

In table 1 we present descriptive statistics for homicide rates and the other variables in the analysis. We classify the cause of death according to the 7th to the 10th revision of the International Classification of Diseases from 1950 to 2013 for all ages. Our homicide rate per 100,000 excludes small island nations with less than 100,000 inhabitants (Anguilla, Antigua and Barbuda, Aruba, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Kiribati, Montserrat, San Marino, Seychelles, St Kitts and Nevis and Turks and Caicos Islands). Because homicide rates exhibit a high level of skewness and kurtosis (6.228 and 51.599, respectively), we performed a natural log transformation, which reduced skewness and kurtosis of the homicide rate measure to 0.630 and 3.208, respectively. In the online supplementary material for figure S1 we show that the logged homicide rate follows a strong linear pattern when compared against quantiles of the normal distribution.

### **Independent Variable: Globalization**

Our measure of globalization is the sum of export and import values divided by the Gross Domestic Product (GDP) obtained from Penn World Table 9.1 (Feenstra and Inklaar 2019). The measure includes information on the share of merchandise exports and imports at current prices for the country-years included



in the analysis. This is the most common measure of globalization and [Alesina and Wacziarg \(1998\)](#), see also [Rodriguez and Rodrik 2000](#)) argue that it is the best variable for examining the integration of countries into international markets because it allows comparability across other studies. Countries that are least globalized on this measure are Kyrgyzstan and Georgia, both of which have limited trade heavily dependent on the [agricultural sector](#) ([Coady et al. 2015](#)). The two most globalized countries are Hong Kong and Singapore.

### **Control Variables**

In order to rule out alternative explanations we include control variables shown by theory and prior research to be potentially associated with cross-national homicide.

#### **Gross domestic product**

GDP per capita is likely the single most commonly examined variable in quantitative studies of cross-national homicide ([Messner, Raffalovich, and Sutton 2010](#); [Pridemore 2008](#)), although as previously noted, empirical support for a connection between GDP and cross-national comparative homicide rates has been inconsistent. Nevertheless, we regard GDP as an important control variable for two reasons. First, because our measure of globalization is total imports and exports divided by GDP, we include analysis to rule out the possibility that our findings for globalization are being driven by GDP. Second, prior research reports a significant interaction ([Fetahi-Vehapi, Sadiku and Petkovski 2015](#); [Özyurt and Daumal 2013](#)) between trade openness and GDP such that trade openness increases GDP to a certain threshold value, but then decreases it above that level. To examine the possibility that trade openness has different effects on homicide depending on the level of GDP per capita we include a globalization-GDP per capita interaction term in the analysis. We obtained time-series data for GDP per capita from Penn World Table 9.1. Countries with the lowest GDP per capita were Tajikistan and Kyrgyzstan; those with the highest were Luxembourg and Norway.

#### **Economic stress**

We operationalize economic stress by taking one minus economic prosperity, which we measure as the price level of household consumption ([Feenstra and Inklaar 2019](#)). We expect that compared to individuals in countries with high economic prosperity, individuals in countries with low prosperity will experience more economic stress. Countries with the greatest economic stress on this measure are Trinidad/Tobago and Mexico while those with the least are Norway and Switzerland.

#### **Low labor share income**

We also measure economic stress by examining labor's share of national income—measured as one minus the total amount of GDP paid out in wages,



salaries and benefits for each country (Feenstra and Inklaar 2019). If economic stress advocates are correct, it could be that compared to countries where laborers receive a high share of income in wages, individuals in countries where laborers receive a low share of income in wages will experience higher economic stress and higher homicide rates. Countries with the lowest labor share of income in our analysis are Qatar and Azerbaijan while those with the highest labor share of income are Peru and Kyrgyzstan.

### **Income inequality**

Many studies over several decades support the conclusion that country-level income inequality is associated with high homicide rates (Baumer and Wolff 2014; Nivette 2011) and rising income inequality is a common criticism of globalization (Kanbur 2015; Wade 2004). Our inequality measure (the GINI index) is obtained from the Standardized World Income Inequality Database (Solt 2016). Countries with the lowest income inequality in our study are Iceland and Finland while those with the highest are South Africa and Jamaica.

### **Human capital**

As a proxy for human capital per person, we include an index (from Penn World Table 9.1) based on average years of schooling (Barro and Lee 2013; Cohen and Soto 2007) and returns to education (Psacharopoulos 1994). This measure controls for the possibility that compared to countries with low levels of educational attainment and return from education, countries with high levels of attainment and high return from education will experience less homicide (Borg and Parker 2001; Gamlin 2015). Countries with the lowest educational attainment/return from education in our data are Egypt and Thailand; while those with the highest are the United Kingdom and the United States.

### **Ethnic fractionalization**

We include a measure of ethnic fractionalization to control for the possibility that this type of heterogeneity is a significant predictor of cross-national homicide (Messner 1989; Treisman 2000). The time-series was obtained from the Historical Index of Ethnic Fractionalization Dataset (Drazanova 2019), which defines fractionalization as the likelihood that two randomly selected individuals drawn from the population belong to two different ethnic groups. Countries with the lowest fractionalization are Portugal and South Korea while those with the highest are South Africa and the Philippines.

### **Percent youth (15–29)**

The expectation that countries with young populations are likely to experience high homicide rates is common in the cross-national crime literature (Santos et al. 2019; Neapolitan 1998). Our measure of percent youth is drawn from the UN World Population Prospects data (United Nations 2015) and measures the proportion of the population in a given country between 15 and 29 years old relative to the total resident population for all age ranges. Countries with the

lowest percent of youth in our dataset are Italy and Japan while those with the highest percent of youth are Qatar and Singapore.

### **Percent urban**

Declines in urbanization have been identified as one of the variables responsible for reductions in lethal violence across countries (Baumer and Wolff 2014; Nivet 2011). Our percent urban variable measures the proportion of the population in a given country that resides in urban areas relative to the total resident population (World Bank 2018). Countries with the lowest percent urban population are Trinidad/Tobago and Sri Lanka while those with the highest are Hong Kong and Singapore.

### **Lagged homicide**

We include the lagged homicide rate to account for the possibility that homicides in a given year are a function of homicides in the previous year, typical of retaliation models of interpersonal violence (Kubrin and Weitzer 2003b; Pyrooz 2012).

## **Methods and Results**

### ***Bivariate Correlations***

We show bivariate correlations and variance inflation factor coefficients for all variables in table 2. Our measure of globalization is associated with low homicide rates. In addition, countries with high GDP, more human capital and a large percent urban have lower homicide rates. Countries with more economic stress, a low labor share of income, higher income inequality, greater ethnic fractionalization and a higher percent of young people have higher homicide rates. We note in passing that these bivariate correlations suggest that in the aggregate, our globalization measure is not associated with many of the negative economic and social characteristics frequently suggested by its critics. Thus, countries with high globalization have high GDP, greater human capital, and a high percent urban. Countries with high globalization have low economic stress, low income inequality, low ethnic fractionalization and low percent youth.

According to table 2, the highest pairwise correlation between two of the variables in our analysis is  $-0.768$  (GDP per capita and economic stress). The Variance Inflation Factor (VIF) for all of our control variables is below 4 (highest VIF value for GDP per capita is 3.2). Hence, we do not see major threats from multicollinearity.

### ***Descriptive Results for Homicide and Globalization***

We show trends for globalization and homicide in figure 1. In general, globalization increased steadily from 1965 to 1980, was relatively flat from 1981 until 1989 and then increased steeply from 1990 to 2013. Homicide trends were more

Table 2. Bivariate Correlations and VIF Values

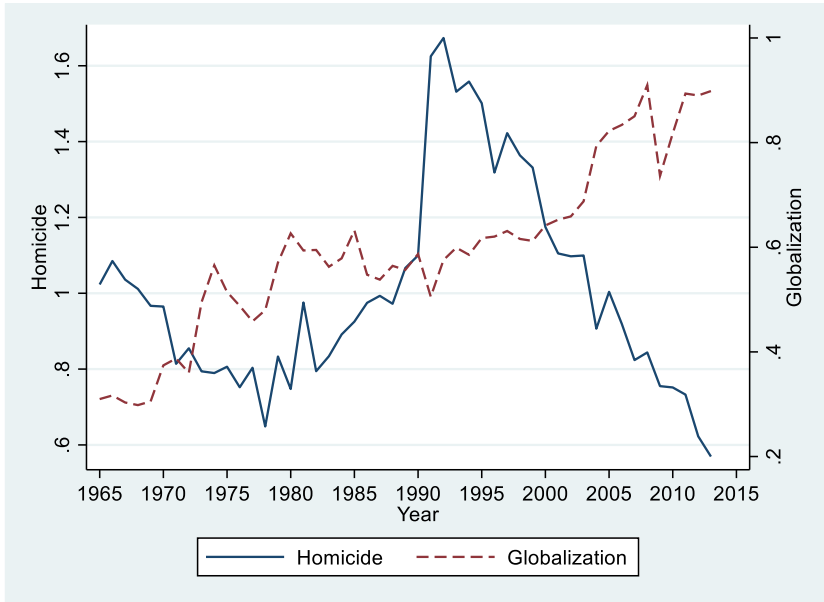
Panel A. Pairwise correlations										
	Homicide	Globaliza- tion	GDP per capita	Economic stress	Low labor share	Human capital	Income inequality	Ethnic fraction- alization	Percent youth	Percent urban
Homicide	1.000									
Globalization	-0.366***	1.000								
GDP per capita	-0.514***	0.403***	1.000							
Economic stress	0.451***	-0.430***	-	1.000						
			0.768***							
Low labor share	0.155***	0.029	-	0.149***	1.000					
			0.234***							
Human capital	-0.278***	0.231***	0.578***	-0.594***	-0.320***	1.000				
Income inequality	0.414***	-0.242***	-	0.379***	0.462***	-0.597***	1.000			
			0.571***							
Ethnic fractionalization	0.414***	-0.100***	-	0.209***	0.314***	-0.220***	0.501***	1.000		
			0.241***							
Percent youth	0.353***	-0.237***	-	0.556***	0.357***	-0.602***	0.618***	0.377***	1.000	
			0.578***							
Percent urban	-0.320***	0.395***	0.498***	-0.501***	-0.074***	0.407***	-0.296***	-0.198***	-	1.000
									0.346***	

(continue)

**Table 2. Continued.**

Panel B. Variance inflation factor coefficients									
	Homicide	Globaliza- tion	GDP per capita	Economic stress	Low labor share	Human capital	Income inequality	Ethnic fraction- alization	Percent youth
Globalization	1.35								
GDP per capita	3.20	3.19							
Economic stress	3.11	3.00	2.00						
Low labor share	1.36	1.33	1.33	1.34					
Human capital	2.26	2.24	2.23	1.97	1.96				
Income inequality	2.85	2.79	2.39	2.37	2.22	1.97			
Ethnic fractionalization	1.44	1.44	1.40	1.41	1.39	1.35	1.17		
Percent youth	2.24	2.24	2.23	1.98	1.97	1.74	1.28	1.14	
Percent urban	64.1	47.1	38.1	1.26	1.23	1.16	1.14	1.14	1.00

\*\*\* $p < .001$ .

**Figure 1. Globalization and homicide trends, 1965–2013.**

erratic, declining gradually from 1965 until 1979, increasing to a peak in 1991 and then falling sharply until 2013. While the association between globalization and homicide is imperfect, the two time-series clearly demonstrate an inverse relationship, especially for the years 1965 to 1979 and 1990 to 2013.

To test for stationarity of the homicide and globalization series, we used the Fisher-type unit-root test based on the augmented Dickey-Fuller (ADF) test for panels (Choi 2001). The inverse chi-square measures ( $P = 351.09$  and  $251.88$  respectively) are statistically significant at the  $p < .01$  level, which means that we reject the null hypothesis that all the panels contain unit roots. To control for the impact of cross-sectional dependence, we subtract the mean of the series across the panels in the analysis. We also include a linear time trend in the ADF test.

### **Quantile Regression for Panel Data Regression Model**

We use quantile regression analysis for panel data (QRPD) for the main part of our analysis (Powell 2016). Compared with ordinary least squares (OLS), the QRPD method is more appropriate for at least two reasons. First, QRPD is robust to outliers as it estimates the conditional median of the homicide rates rather than the conditional mean as in the case of OLS, making it useful for understanding outcomes that are non-normally distributed and that have nonlinear relationships with predictor variables (Bitler, Gelbach, and Hoynes 2006). Second, QRPD enables us to investigate whether the impact of globalization on homicide rates is significant and negative across the entire spectrum

of globalization values, and whether the most globalized countries experienced lesser changes in homicide compared with the least globalized countries (Powell 2016).

Compared to a standard analysis where fixed effects enter the model as dummies and have a different intercept for each country-year observation in the panel, the fixed effects in Powell's QRPD model are included in the moment conditions but not in the model (all country-year observations have the same intercept). As a result, we can interpret the coefficients in the same way as in a quantile regression involving cross-sectional data. Given that different countries may have observed levels of homicide rates that have no relation to globalization, we include country fixed and time effects. Consistent with the hypothesis that globalization reduces homicide, we estimate the following model:

$$\ln(\text{HR}_{it}) = \alpha_i + \beta_1 \ln(\text{HR}_{it-1}) + \beta_2 \text{GLOBAL}_{it} + \beta_3 x_{it} + T_t + \varepsilon_{it} \quad (1)$$

For outcome  $\text{HR}_{it}$  ( $i$  indexes countries and  $t$  indexes time),  $\alpha_i$  indexes the full set of country specific intercepts;  $T_t$  indexes the full set of year-specific effects that capture common trends in the homicide rates for the countries analyzed and  $\varepsilon_{it}$  denoting the error term that captures omitted variables. We include the lagged value of the dependent variable  $\text{HR}_{it}$  to capture persistence in homicide rates and the tendency of homicide rates to return to the equilibrium value for country  $i$  (i.e., mean-reverting dynamics). In equation (1), our main variable of interest is  $\text{GLOBAL}_{it}$ . The estimated coefficient  $\hat{\beta}_2$  measures the impact of globalization on the logged homicide rate for country  $i$  at time  $t$ . The set of control variables are included in the vector  $x_{it}$ . We use the Markov Chain Monte Carlo (MCMC) optimization method to estimate the QRPD model specified in equation (1). We set the algorithm to perform 1000 draws and drop 100 draws as a burn-in period.

In table 3 we show the results for the QRPD analysis. Model 1 includes GDP per capita and the other control variables; model 2 adds a globalization by GDP per capita interaction term. The estimated  $\hat{\beta}_1$  is positive and significant, indicating that there is a considerable degree of persistence in the logged homicide rates. Consistent with arguments that globalization reduces homicide rates, the first two models in table 3 show that the estimated coefficient for globalization  $\hat{\beta}_2$  is negative and strongly significant. According to model 1, for every (1/1000) unit increase in globalization the logged homicide rate declines by 24.407, setting all dummies to zero and holding the full set of controls constant. Model 1 shows that as GDP per capita increases, homicides increase. The results also show that globalization and GDP per capita have opposite effects on homicides.

The estimated coefficients  $\hat{\beta}_3$  for the vector of control variables  $x_{it}$  are also significant and in the expected direction. Thus, homicides are more common in countries experiencing high economic stress, high income inequality, high ethnic fractionalization, a high percent of youth and high homicide in the past year. Homicides are less common in countries with a high labor share of income, high human capital/educational attainment, and a high percent urban.

**Table 3. Estimated Coefficients for Quantile Regression for Panel Data (QRPD) Model by Adaptive MCMC Optimization with Country and Year Fixed Effects**

	(1)	(2)	(3)	(4)	(5)
Outcome: Homicide					
Globalization	-24.407*** (0.199)	-25.766*** (0.598)		-25.717*** (0.410)	-25.516*** (0.571)
Lagged globalization			-28.930*** (0.769)		
GDP per capita	3.760*** (0.159)	4.152*** (0.311)	3.427*** (0.442)	4.864*** (0.252)	3.573*** (0.292)
Globalization*GDP per capita		809.907* (363.746)			
<b>Controls</b>					
Economic stress	45.361*** (1.463)	44.372*** (1.099)	38.646*** (3.578)	45.696*** (1.088)	37.837*** (1.358)
Low labor share income	-17.053*** (2.088)	-36.878*** (5.694)	-35.490*** (2.155)	-24.339*** (2.614)	-49.373*** (2.923)
Income inequality	2.058*** (0.022)	2.249*** (0.074)	2.054*** (0.086)	2.537*** (0.042)	2.338*** (0.022)
Human capital	-22.293*** (0.402)	-19.663*** (0.364)	-22.846*** (0.994)	-18.129*** (0.489)	-24.799*** (0.625)
Ethnic fractionalization	28.497*** (0.942)	41.262*** (2.686)	39.069*** (2.841)	29.233*** (0.964)	27.421*** (0.655)
Percent youth	134.049*** (5.639)	128.477*** (7.508)	101.562*** (18.711)	133.208*** (9.231)	94.898*** (8.555)

*(continue)*



**Table 3. Continued.**

	(1)	(2)	(3)	(4)	(5)
<b>Outcome: Homicide</b>					
Percent urban	-21.738*** (0.568)	-26.653*** (1.317)	-19.541*** (0.904)	-27.971*** (1.214)	-15.043*** (0.729)
Lagged homicide	0.970*** (0)	0.969*** (0)	0.969*** (0)	0.966*** (0)	0.969*** (0)
<i>MCMC diagnostics</i>					
Mean acceptance rate	0.442	0.549	0.329	0.468	0.387
Number of observations	2145	2145	2145	2095	2125
Number of countries	78	78	78	70	78
Min observations per group	3	3	3	10	3
Max observations per group	53	53	53	53	49
First year	1960	1960	1960	1960	1965
Last year	2013	2013	2013	2013	2013

Notes: Seed used = 123; Total draws: 1000; Burn-in draws: 100.

\*  $p < .05$  \*\*\*  $p < .001$

In model 2 of [table 3](#) we add a globalization\*GDP per capita interaction term, which is positive and significant at the  $p < .05$  percent level. These results show that globalization exerts a stronger negative effect on homicides when countries possess low levels of GDP per capita. Note that the direction and significance of the other control variables remains the same.

To enhance confidence in the results, we perform three sensitivity checks. First, we include the lagged globalization term in [table 3](#) model 3. Compared with the base model, the estimated coefficient for globalization decreases from  $-24.407$  to  $-28.93$  but remains statistically significant. Although the mean acceptance rate (a measure of model appropriateness) of model 3 decreases to 0.329, the lagged model nonetheless remains in the optimal range ([Rosenthal 2011](#)).

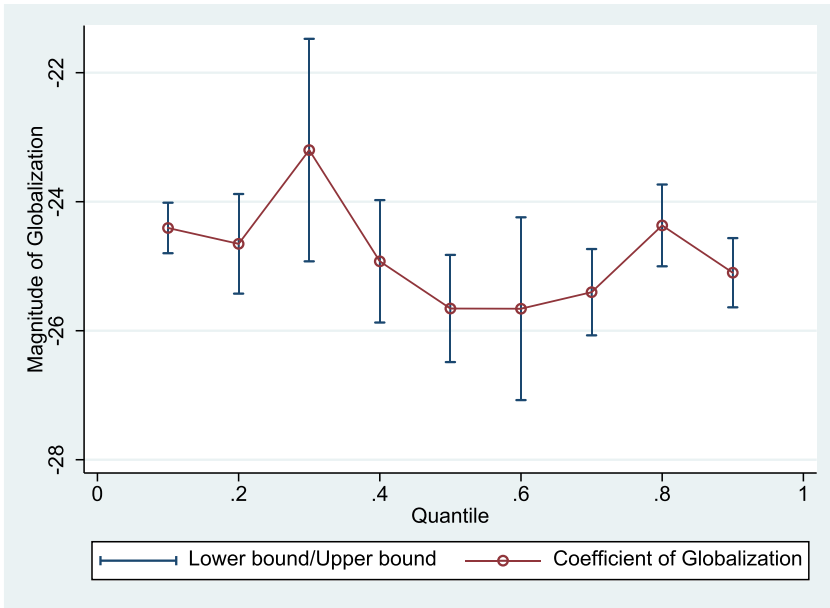
Second, in model 4 we drop countries with fewer than 10 years of data (Honduras, Jamaica, Ukraine, Suriname, Taiwan, Jordan, Turkey, Bolivia, Cabo Verde, Iran, Iraq, Kuwait, Tunisia, Fiji, Qatar). The number of observations decreases to 2095. Compared with the base model, globalization remains negative and significant while the mean acceptance rate becomes slightly larger.

Finally, in model 5, we drop ten countries with observations from the part of the series with the fewest countries, 1960 to 1964 (Hong Kong, Costa Rica, Japan, Mexico, Philippines, Sweden, Taiwan, Thailand, United Kingdom and United States). The number of observations decreases to 2125. Compared with model 1, the estimated coefficient for globalization is slightly smaller but the mean acceptance rate of the model decreases from 0.442 to 0.387. Across all of these models, homicide declines are consistently associated with globalization increases.

### **Quantile Plot for Globalization**

To determine the extent to which connections between globalization and homicide are consistent across the 54 years included in the analysis, we next estimate a quantile plot for globalization based on the model specification shown in model 1 of [table 3](#). According to [figure 2](#), globalization is consistently associated with declining homicide rates across the entire quantile spectrum. For countries located at the 10th percentile (top three countries are United States, Mexico and Brazil), every unit increase in globalization is associated with an expected decline in the logged homicide rate of 24.4; while at the 90th percentile (e.g., Singapore, Hong Kong, Belgium) every unit increase in globalization produces a 25.1 expected drop in homicide. We note that countries situated along the 50th to 60th percentile experience the largest decline in homicide (25.8) for every unit increase in globalization. The top three countries in this range are Mauritius, New Zealand and Canada.

Our findings show that homicide decreases as countries move up the globalization continuum. For instance, from 1963 to 1969 the average globalization of Mexico was 0.075 which placed it under the 10th percentile. The corresponding average logged homicide rate was 2.83. From 2003 to 2009, the average globalization in Mexico reached 0.5 which placed the country along the 50th

**Figure 2. Coefficient for globalization by quantile with 95% confidence intervals.**

to 60<sup>th</sup> percentile. The corresponding average homicide rate fell to 2.31 during this period.

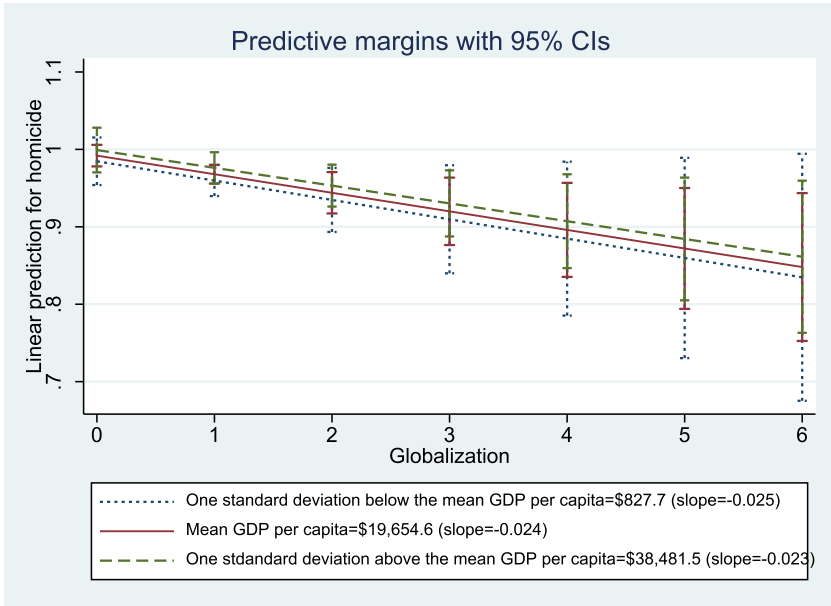
### **Predictive Margin Plots for Globalization**

In figure 3 we show the predictive margin plots for homicide by globalization for GDP per capita and inequality. The three values for GDP per capita are the mean (\$19,654.6), one standard deviation below the mean (\$827.7) and one standard deviation above the mean (\$38,481.5). The globalization slopes are  $-0.024$ ,  $-0.025$  and  $-0.023$ , respectively. According to Panel A of figure 3 and consistent with the QRPD analysis, as we move from lower to higher levels of GDP per capita, the magnitude of the negative association between globalization and homicide declines. Thus, as globalization increases, the rate of decline ( $-0.025$ ) in homicide for countries with GDP per capita one standard deviation below the mean (Tajikistan, Kyrgyzstan, Thailand) is 8.7 percent greater compared with countries with GDP per capita one standard deviation above the mean ( $-0.023$ ; United States, United Kingdom, Germany). However, note that these differences are relatively modest and that globalization reduces homicide across all levels of GDP per capita.

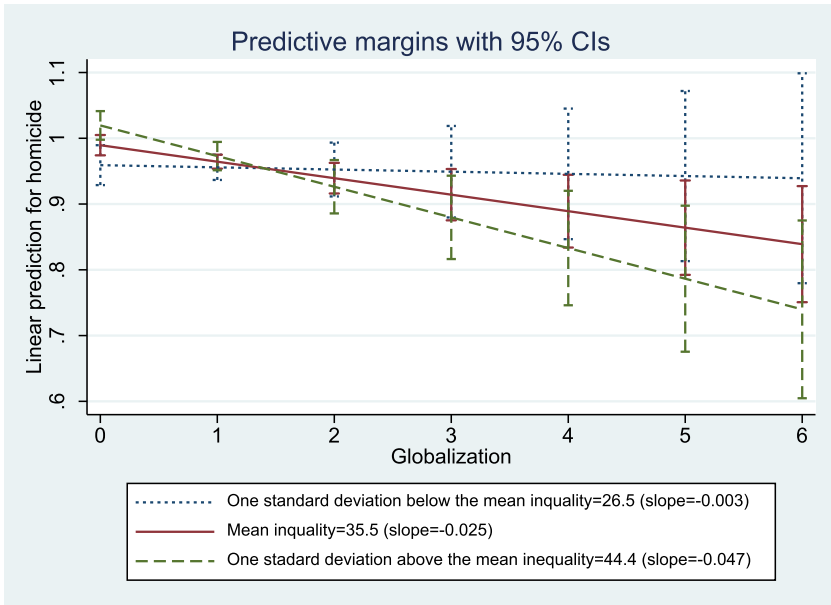
In Panel B, we show the results of a similar analysis for three values of inequality: the mean GINI index (35.5), one standard deviation below the mean (26.5) and one standard deviation above the mean (44.4). The corresponding globalization slopes are  $-0.025$ ,  $-0.003$  and  $-0.047$ , respectively. The results

**Figure 3. Predictive margins plot for homicide by globalization.**

**Panel A.**



**Panel B.**



show that the rate of decline in homicide for countries with inequality one standard deviation above the mean (Barbados, Dominican Republic, Mexico)

is 15.7 times larger compared with countries with inequality one standard deviation below the mean (Belgium, Netherland, United Kingdom). However, note that globalization reduces homicide across all levels of inequality. In short, our results show that globalization exerts the greatest impact on homicide for poor countries with high inequality and a lesser impact on rich countries with low inequality. Moreover, income inequality exerts a great deal more influence on homicide than GDP per capita as globalization increases.

### **Robustness Test**

We next investigate the robustness of our results by estimating an [Arellano and Bond \(1991\)](#) dynamic panel model using the generalized method of moments (GMM) estimator ([Newey and Windmeijer 2009](#); [Bun and Windmeijer 2010](#)). This model has been commonly adopted in the social sciences to overcome endogeneity as a result of unobserved time-invariant heterogeneity and reverse causality ([Aslaksen 2010](#); [Aisen and Veiga 2013](#)). According to [Leszczensky and Wolbring \(2019\)](#), the Arellano and Bond GMM estimator assumes no serial correlation in the errors and provides consistent estimates even in the presence of reverse causality. Based on equation (1), we lag the independent variables to get rid of the strict endogeneity assumption that  $E(\varepsilon_{is}|x_{it}, \alpha_i) = 0$  for all  $s, t = 1, \dots, T$  and take the first difference to remove  $\alpha_i$ . We estimate the following model specification using the steps introduced by [Roodman \(2009\)](#):

$$\Delta \ln(\text{HR}_{it}) = \beta_1 \Delta \ln(\text{HR}_{it-1}) + \beta_2 \Delta \text{GLOBAL}_{it-1} + \beta_3 \Delta x_{it-1} + \Delta T_t + \Delta \varepsilon_{it} \quad (2)$$

For outcome  $\text{HR}_{it}$  ( $i$  indexes countries and  $t$  indexes time),  $T_t$  indexes the full set of year-specific effects that capture common trends in the homicide rates for the countries analyzed; and  $\varepsilon_{it}$  denotes the error term that captures omitted variables. Because the Arellano and Bond GMM estimator assumes  $\ln(\text{HR}_{it-2})$  is uncorrelated with  $\Delta \varepsilon_{it}$ , we use it as an instrumental variable for  $\Delta \ln(\text{HR}_{it-1})$ . Likewise, we instrumented for  $\Delta \text{GLOBAL}_{it-1}$  using a double lag (i.e.,  $\text{GLOBAL}_{it-2}$ ). We present the results in the online supplementary material for [table S2](#).

Consistent with arguments that globalization reduces homicide rates, the results of our robustness tests show that the estimated coefficient for globalization is negative and strongly significant across two additional model specifications. In model 1, increases in the lagged globalization term significantly decreases the log homicide rate ( $-99.956$ ;  $p < .01$ ). When we include two lags of the dependent variable in model 2, lagged globalization remains negative and significant ( $-81.444$ ;  $p < .05$ ). We perform two post estimation tests to ensure that the estimates are valid ([Hsiao 2014](#)). First, the Arellano-Bond test for AR (2) in this model ( $z = -0.78$ ;  $p = .433$ ) shows that there is no further serial correlation, satisfying the assumption of no autocorrelation in the GMM estimator. This result indicates that lags of the homicide rate and the globalization dependent variable are not endogenous and may be considered

valid instruments. Second, we perform the Hansen J test to investigate whether the instruments appear to be exogenous as a group (i.e., the null hypothesis is: instruments as a group are exogenous). The chi-square values (70.21 and 64.37 in models 1 and 2, respectively) are not statistically significant, indicating that there is no evidence to reject the null hypothesis that the instruments we used are exogeneous as a group.

## Discussion and Conclusions

While there are few direct tests of the impact of trade globalization on cross-national homicide rates, there are theoretical reasons to expect the two to be linked. The idea that increased trade and commerce will reduce interpersonal violence can be traced back to antiquity. The *doux-commerce* argument that growing trade and commerce produce major declines in violent behavior was made strongly by Montesquieu and other scholars of the Enlightenment. It is a central part of Elias's explanation for the historic declines in violent crime in Western Europe over the past half millennium. And it is vital to Hirschman's (1997) argument that increasing commerce is a powerful moralizing agent capable of bringing important nonmaterial benefits to countries. These theorists and researchers all argue that by increasing the state's monopoly on the use of violence globalization discourages vigilantism and reduces violent interpersonal crime. Further, by creating trade surpluses globalization provides additional revenue that can be used to improve the effectiveness of policing and the legal system. In addition, these authors argue that increasing globalization can have a civilizing effect on human interactions and encourage feelings of trust and empathy for others. They suggest that greater trade with diverse societies increases individuals' rational interest in engaging peacefully with other members of those societies. Thus, all of these arguments are consistent with the conclusion that trade globalization will lead to declines in country-level homicide rates.

Prior research on cross-national comparative crime has often been limited by small, unrepresentative samples. In response, one of our goals in this analysis was to test the effects of globalization on cross-national homicide rates with the most inclusive data base possible both in terms of total countries included and number of years analyzed. We assembled a cross-national panel, included a wide range of control variables and offered a novel analytic strategy. We hypothesized that homicide rates will be significantly lower for countries with high rates of globalization, compared to countries with low levels of globalization. Consistent with the *doux-commerce* argument, we find that rising globalization in the countries examined has resulted in lower homicide rates during the past half century. To maximize confidence in the results, we tested for interaction between globalization and GDP per capita and inequality, and performed a robustness check using two different approaches to the potential endogeneity between homicide and globalization. These tests confirmed that globalization over the past half century has been associated with homicide declines and that these declines are greatest for low GDP per capita-high inequality countries.

The fact that we find the greatest effects of globalization on homicide for low GDP per capita-high inequality countries is especially interesting because critics of globalization (Bourguignon 2017; Sassen 2018) suggest that poor countries that are more peripheral to the world economy are especially vulnerable to the negative effects of globalization. By contrast, our multivariate analysis shows that trade openness has stronger effects on homicide at lower levels of GDP per capita; the decrease in homicide for countries that are situated along the 50th to 60th percentile is the largest. Moreover, countries with high levels of income inequality experience greater declines in homicide as globalization increases. While the specific mechanism accounting for this relationship is beyond the scope of the current analysis, our results suggest that common criticisms of globalization are not substantiated with regard to the most commonly studied measure of violent crime.

We recognize several important limitations of our study. First, as noted above, both Elias's civilizing perspective and Hirschman's *doux commerce* thesis apply the concepts to trade in general—not only international trade. We argue that globalization through international trade has increased so much in the past half century that it is having measurable effects on violent crime. Gleditsch (2002) shows that the worldwide trade-to-GDP ratio rose from just over 20% in 1995 to 30% in only twenty years. Many of the countries in the current analysis with low homicide rates also have extremely high trade to GDP ratios including Luxembourg (424.0%), Hong Kong (375.1%) and Singapore (322.4%) (World Bank 2018). In general, the trade-to-GDP ratio is much lower in countries with large economies and large populations such as Japan (31.2%) and the United States (26.6%). Nevertheless, globalization in these countries is still large and growing. While we focus in this study on the effects of international trade, identifying and including measures of within-nation commerce would be a valuable direction for future research.

Second, although we assembled a long time series for a large number of countries, we acknowledge that more inclusive data would be an improvement. Cases included in the WHO data are skewed toward Europe (44.7%), the Americas (28.2%) and Asia (23.8%). Coverage is much weaker for Africa and the Middle East.

Finally, while we were able to include a robust set of control variables, greater coverage of such variables as the decommodification index used in previous cross-national homicide studies would be helpful (Trent and Pridemore 2012; Messner, Raffalovich, and Shrock 2002). Notwithstanding these limitations, we find significant and robust empirical support for our contention that homicide declines with globalization, especially for low GDP per capita-high inequality countries.

Our results expand on several strands of prior research on trade globalization and crime that have been neglected in the past. While Elias's civilizing perspective has gained more attention among social scientists in recent years (Karstedt 2001; Lanier, Henry and Anastasia 2018), it still has had relatively little impact on comparative research, especially in the United States. A search of classic criminology textbooks (Sutherland and Cressey 1978; Vold and Bernard 1986)



reveals no mention of Elias's work. Similarly, Hirschman's (1997) work on *doux commerce* is rarely cited by social scientists interested in crime, especially outside of Europe. However, consistent with Elias' and Hirschman's arguments, our research shows that over the past half century, globalization has been associated with declining homicide rates for the countries of the world for which we have reliable data. If these findings are confirmed in subsequent research they suggest that theoretical arguments about the positive benefits of an increasingly globalized world may extend to behavior like violent crime.

To the extent that the *doux commerce* conceptual framework has relevance for the understanding of cross-national homicide rates, there are several opportunities for future research. First, although we demonstrate a connection between increasing globalization and declining homicide rates, we do not provide the precise mechanism through which this connection occurs. It will be useful in future research to explore the importance of potential competing pathways such as strengthening the state, improving the criminal justice system, and increasing citizen empathy and trust.

Second, as noted, we concentrate in this analysis only on international trade whereas Elias and other supporters of the *doux commerce* argument also include intra-state commerce. Moreover, in addition to trade, Elias emphasizes the potential impact on crime of the growth of self-restraint and the centralization of authority. While finding suitable cross-national longitudinal measures of concepts such as these is challenging, it will be useful to broaden cross-national research on homicide to include other key elements of Elias' conceptual scheme.

Third, it will be useful to explore regional patterns in future research. For example, it could be that connections between globalization and homicide differ by region of the world. Future research should endeavor to develop more precise metrics for measuring the differential impact of globalization across regions.

Fourth, although globalization encompasses political, social and cultural connections across borders, in this paper we focus only on economic globalization and in particular on trade levels. In future research it will be useful to examine the impact of non-economic measures of globalization, such as political globalization and social globalization, on cross-national crime rates.

Finally, for many years the data collected by the World Health Organization have been regarded as the best data available for the cross-national study of homicide. At the same time, the crime surveys collected by the United Nations Office of Drugs and Crime (UNODC) have been used less frequently for homicide studies. However, both sources have evolved rapidly in recent years. More research directly comparing WHO and UNODC homicide data along with suggested guidelines for the use of these data would be useful.

For the most part social science has ignored the possible impact of trade globalization on cross-national rates of violent crime. We see this as an important omission because both critics of globalization and its defenders point to anticipated effects of globalization that are commonly linked to crime. Moreover, while violent crime rates are only one of the possible outcomes that are potentially affected by globalization, they are nonetheless an important element to consider when developing national and international policies on trade. Throughout

most of the 18th century, many western intellectuals accepted as fact the *doux commerce* assertion that expanding trade and commerce has beneficial effects on civilizing human behavior and reducing crime. However, most contemporary research on cross-national comparative homicide has ignored globalization as a factor in predicting crime rates and has instead concentrated on a set of economic stress and modernization variables that are widely attributed to globalization by its critics. We operationalize globalization as trade openness, analyze a large cross-national homicide database and include a robust set of control variables. Our analysis consistently shows that trade globalization during the past half century has been associated with significant declines in national homicide rates and that these effects are especially strong for low GDP per capita-high inequality countries. Our results suggest that at least in terms of homicide, it may be beneficial to encourage further globalization while at the same time developing policies that reduce economic stress and income inequality.

## Notes

1. In one of the few studies of cross-national homicide rates that includes a measure of police strength, Fajnzylber, Lederman, and Loayza (2002) did not find a significant effect of police per capita on homicide—however, the study was limited to 39 countries.
2. For convenience, we follow the coding strategy of the WHO and treat the Hong Kong Special Administrative Region of the People’s Republic of China here as a separate country.
3. We obtained additional ethnic fractionalization data from Alesina et al. (2003) for the following countries: Hong Kong, France, Germany, Iceland, Kyrgyzstan, Malta, Macedonia, Suriname.
4. For replication, we used 123 as the seed.

## Supplementary Material

Supplementary material is available at *Social Forces* online.

## About the Authors

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