Modernization Theory Revised: Testing the Relationship between Inward Foreign Direct Investment and Homicide

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Abstract: *Purpose*: Modernization theory suggests that economic development is temporarily disruptive to social life and can lead to crimes of violence such as homicide. However, few studies have considered how the modernization process works. Specifically, they neglected the role of globalization. Previous research has suggested that certain measures of globalization may be theoretically linked to homicide. This study examines how inward Foreign Direct Investment (FDI), a key component of globalization and economic development, is associated with cross-national homicide rates.

Methods: Data from 101 countries were collected and analyzed to examine the relationship between inward FDI and homicide. Indirect effects of inward FDI on homicide through urbanization and economic growth were also examined.

Results: The results show that inward foreign direct investment increases cross-national homicide rates, both directly and indirectly through increased urbanization.

Conclusion: While economic development benefits society, the concomitant, deleterious effects should be considered by policymakers, especially those seeking inward foreign direct investment in their countries. Future researchers will want to consider examining other measures of globalization.

Keywords: Homicide, cross-national, globalization, modernization, violence, trade.

INTRODUCTION

Numerous studies seek to explain variation in cross-national homicide rates (Baumer and Gustafson, 2007; Bjerregaard and Cochran, 2008; Cochran and Bjerregaard, 2012; LaFree and Jiang, 2023; Li, 1995; Maume and Lee, 2003; Messner and Rosenfeld, 1997; Nivette, 2011; Renno Santos, Weiss, and Testa, 2022; Rogers and Pridemore, 2023; Savolainen, 2000). While there are various perspectives to explain why homicide rates vary (e.g. opportunity-based theories, cultural theories, and economic deprivation theories), many studies use modernization theory to attribute changes in homicide to increases in economic growth and urbanization (Arthur, 1991; Bennett, 1991; Clement, Pino, and Blaustein, 2023; Huang, 1995; Levchak, 2015; Levchak, 2019; Neuman and Berger, 1988; Ortega, Corzine, Burnett, and Poyer, 1992; Shelley, 1981). According to scholars of modernization theory, the process of transitioning from an agrarian and rural society to an industrialized/service-based and urban one is disruptive to social life. The process of modernization can weaken social bonds and support networks, lead to the emergence of conflicting norms, and result in a shortage of housing, employment, and other necessary infrastructures to accommodate the increasing number of individuals who have left their old lives for opportunities in growing urban areas (Shelley, 1981).

To empirically test modernization theory, scholars have examined how development (i.e. economic growth) and urbanization have impacted cross-national homicide rates (Bennett, 1991; Huang, 1995; Neuman and Berger, 1988; Ortega *et al*., 1992; Shelley, 1981). While economic growth and urbanization might be outgrowths of the modernization process, Levchak (2019) argued that testing only their impact on cross-national homicide rates is a limited test of modernization theory. Instead, research should examine how countries modernize by considering the factors that lead to increases in economic growth and urbanization. The process of globalization, which has created an environment where a country's level of development can be highly dependent on trade relationships and the investments it receives from multinational corporations, can be used to explain how countries modernize (Brady and Denniston, 2006; Waters, 2001; World Bank, 2023). Therefore, Levchak (2019) argued that the concept of globalization should be incorporated into studies of modernization theory. Existing research shows that certain measures of globalization, particularly inward foreign direct investment, are related to higher levels of economic growth and urbanization (Bengoa and Sanchez-Robles, 2003; Campos and Kinoshita, 2002; London, 1987; London and Smith, 1988; Sit, 2001; Sit and Yang, 1997; Zhu, Luo, and Zou, 2012).

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Therefore, this study seeks to empirically test the theoretical arguments put forward by Levchak (2019). This is accomplished by using quantitative data analysis to (1) examine the direct effect of inward foreign direct investment on cross-national homicide rates and (2) examine the indirect effects of inward foreign direct investment on cross-national homicide rates via economic growth (GDP) and urbanization. This article proceeds with a discussion of modernization theory and a review of Levchak's (2019) revised version of modernization theory. Next, there is a description of the study's data and methodology. This study uses time-series cross-sectional data for 101 countries from 1992 to 2020. Homicide data from the World Bank and the World Health Organization were collected, along with data on inward foreign direct investment, gross domestic product, and urbanization. Data on several other factors such as the strength of democracy, employment, and infant mortality were collected from various sources and controlled for. This article concludes with a discussion of the results, limitations, and recommendations for future research.

LITERATURE REVIEW

Modernization Theory

The roots of modernization theory can be traced to Emile Durkheim's (1951 [1897]) analysis of the division of labor in society. As countries transition from mechanical to organic societies, they experience a heightened risk of violent crime, particularly homicide. This effect is most pronounced when the modernization process is rapid, producing a state of anomie, which Durkheim (1951 [1897]) described as an environment where "traditional rules have lost their authority … [a] state of deregulation (p. 253)." For Durkheim (1951 [1897]), this state of deregulation occurs when the process of modernizing leads to the mass migration of residents from rural to urban areas. New arrivals bring conflicting patterns of normative behavior with them, often relying on violent methods to resolve disputes. It is not until they acclimate to their new environment, integrate into urban life, and recognize the importance of interdependence, which is characteristic of advanced, organic societies, that violence can begin to decrease (Neuman and Berger, 1988). Thus, for Durkheim (1951 [1897]), the process of modernization is inherently violent.

Shelley (1981) expanded Durkheim's (1951 [1897], 1984 [1902]) theory of homicide in several ways. First, instead of focusing on the concept of anomie, she emphasized how structural characteristics, such as urbanization, could contribute to increased homicide rates. As countries modernize, they experience migration patterns where many residents, frequently young males, move from rural to urban areas in search of employment. Without sufficient infrastructure to handle the dramatic increase in population, these new urban residents often face a lack of housing, education, and employment. This can lead to an increase in unemployment and poverty, which are risk factors for homicide (Cole and Gramajo, 2009). Second, Shelley (1981) argued that the availability of material goods, which are much less accessible in rural areas, increases the desire for them. Young men who are unable to purchase those material goods are likely to experience strain, and some may respond by committing both property and/or violent crimes. Furthermore, the informal social controls that young men may have experienced from their families in rural settings are largely absent in urban settings. Like Durkheim (1951 [1897]), Shelley (1981) also suggested that individuals who migrate from rural to urban areas are more likely to resolve disputes through violent, extra-legal means and that these disputes may become more common due to the greater population density of urban areas.

Based on the preceding, scholars of modernization theory often seek to test its tenets by examining how gross domestic product and urbanization impact homicide rates. The expectation is that as countries modernize more job opportunities become available in urban areas, attracting many people to these areas. Thus, increases in Gross Domestic Product (GDP) and urbanization are expected to lead to higher rates of homicide.

To test modernization theory, scholars often include gross domestic product (GDP) or Gross National Product (GNP) and urbanization as key covariates in empirical analyses of homicide (Altheimer, 2008; Cole and Gramajo, 2009; Levchak, 2016, Neapolitan, 1997; Messner, 1982; Neumayer, 2003; Ortega *et al*., 1992). Some scholars have created an index of development – which includes various components such as GDP, life expectancy, infant mortality, population growth, and urbanization – to test modernization theory (Messner and Rosenfeld, 1997; Savolainen, 2000). Evidence supporting the link between economic development/gross national product and homicide is mixed. Some studies have found a positive association (Bennett, 1991; LaFree and Jiang, 2023; Ortega *et al*., 1992), while others have found a negative association

(Altheimer, 2008; Bjerregaard and Cochran, 2008; Fajnzylber, Lederman, and Loayza, 2002; Messner, Raffalovich, and Shrock 2002; Neapolitan, 1994; Neapolitan, 1998). Other studies have found no connection between development and homicide (Bjerregaard and Cochran, 2008; Groves, McCleary, and Newman, 1985; Lin, 2007; Huang, 2001). Support for the proposition that urbanization is associated with cross-national homicide rates is also mixed. Studies have found a negative relationship between the two (Altheimer, 2008; Lin, 2007; Messner 1989; Ortega *et al*., 1992), a positive relationship (Clement *et al*., 2023; Levchak, 2016; Neumayer, 2003; Pratt and Godsey, 2003), and no relationship (Cole and Gramajo, 2009; Huang, 1995; Messner, 1980; Neapolitan, 1997).

Modernization Theory Revised

According to Levchak (2019), support for modernization theory might be mixed because scholars do not properly consider how countries develop. Existing studies treat modernization as an independent process that countries go through where their level of economic development is determined solely by their ability to transform from rural and agrarian to urban and industrialized. While it is unlikely that this was ever true, it was perhaps more common in the past for nations to develop in relative states of independence. However, it is certainly not the case today. Most countries are unable to supply all of the natural resources and skills necessary to promote their own development. Thus, they turn to others to fill the gap. The process of globalization has facilitated this by creating social, cultural, political, and economic connections that transcend national boundaries (Waters, 2001). This has allowed multinational corporations to step in and foster the transfer of money, skills, and knowledge into foreign economies (Romer, 1993). Evidence has shown that globalization, specifically economic globalization, leads to increases in gross domestic product for the receiving nations (Balasubramanyam, Salisu, and Sapsford, 1996; Campos and Kinoshita, 2002; Kilic, 2015; Samimi and Jenatabadi, 2014).

If it is true that economic globalization leads to economic growth and urbanization, then modernization theory should be revised to hypothesize that economic globalization is indirectly related to higher rates of homicide through increased GDP (Levchak, 2019). However, determining how to measure globalization can be difficult. While there are many potential measures, there is no consensus on which ones are

best (Brady and Denniston, 2006; Guillen, 2001; Waters, 2001). The following is a non-exhaustive list of some measures that have been used in prior studies to proxy economic globalization: the value of imports, the value of exports, the value of imports minus exports, outward portfolio investment (i.e., ownership by domestic investors in foreign firms), inward portfolio investment (i.e., ownership by foreign firms into domestic firms), outward foreign direct investment, inward foreign direct investment, investment openness (i.e., inward and outward portfolio investment plus inward and outward foreign direct investment, GDP percentage of trade, GDP percentage of foreign trade investments, mean tariff rate, and taxes on international trade (Brady and Denniston, 2006; Guillen, 2001; Kilic, 2015; Levchak, 2019). The sheer number of potential measures is problematic for two reasons. First, from a practical perspective, it is challenging to compile a data set that includes every plausible measure of economic globalization. Second, there is no clarity on which of the preceding measures are most likely to influence economic growth. Instead, the majority of measures have been selected because they have face validity and appear to be logically related to the concept of economic globalization.

Levchak (2019) suggested that researchers should focus on inward foreign direct investment to measure economic globalization. Research has shown that inward foreign direct investment is associated with economic growth and urbanization (Campos and Kinoshita, 2002; London and Smith, 1988; Sit and Yang, 1997). Within criminological research on cross-national homicide, there is a rich history of examining how economic growth and urbanization are linked to homicide rates, and many studies show that they lead to increased rates of homicide (Clement *et al*., 2019; Currie, 1997; Levchak, 2015; Levchak, 2016; Neumayer, 2003; Ortega *et al*., 1992; Shelley, 1981). Therefore, if inward foreign direct investment impacts cross-national homicide rates, it is likely to be indirect – increasing homicide by first increasing economic growth and urbanization.

The Relationship between Inward Foreign Direct Investment and Economic Growth

Previous research shows that foreign direct investment has a positive effect on economic growth under the right conditions. Such conditions include a sufficiently educated labor force, an adequate level of pre-FDI development, sufficiently developed financial markets, and high levels of trade openness (Alfaro,

Chandra, Kalemli-Ozcan, and Sayek, 2004; Balasubramanyam *et al.*, 1996; Blomström, Lipsey and Zejan, 1994; Borensztein, De Gregoria and Lee, 1998; Carkovic and Levine, 2005; De Gregorio, 1992; Hermes and Lensink, 2003; Li and Liu, 2004).

In an analysis of 69 countries between 1970 and 1989, Borensztein *et al.* (1998) found that inward FDI had a direct effect on economic growth and the effect was most pronounced when a nation had a high level of human capital stock, defined as the average years of male secondary schooling (see Barro and Lee, 1993; Barro and Lee, 1994). For countries with both high levels of FDI and human capital stock, economic growth occurred at an average rate of 4.3% per year. Nations that were low on both, however, only experienced an average growth rate of 0.64%. Borensztein *et al.* (1998) attributed this difference in growth rates to the greater capacity of countries with high levels of human capital stock to absorb technological transfers and spillovers from foreign to domestic firms. Similar results were reported by Li and Liu (2004) who also found that the ability to absorb technological spillover was dependent on a country's stock of human capital. Examining 84 countries for the period 1970 to 1999, they found that FDI flows had an independent effect on economic growth and the effect was positive for both developed and developing countries. Additional studies also demonstrated a link between inward FDI and economic growth (Bengoa and Sanchez-Robles, 2003; Campos and Kinoshita, 2002).

Foreign investment has also been found to have a greater effect when pre-FDI technological development is relatively high (Blomström *et al.*, 1994; Li and Liu, 2004). Blomström *et al.* (1994) found the ratio of inward FDI to GDP during a five-year period was positively associated with economic growth in the following five-year period for high-income, developing countries. Li and Liu (2004) showed that a country's technology gap – indexing a country's GDP to the GDP of the United States – hurt economic growth. However, a large technology gap in developed countries did not influence the effect of FDI on economic growth. This is likely because developed countries have some minimum threshold in their ability to absorb technological spillovers derived from FDI. Developing countries, however, generally have low absorptive capacity. Li and Liu (2004) also found a negative interaction effect between FDI and the technology gap of a country – suggesting that FDI is a relatively wasted enterprise in countries where initial technology stock is low.

The impact of FDI may also be dependent on the fiscal state of receiving countries' financial markets (Alfaro *et al.*, 2004). This was evident in the textile industry in Bangladesh in the early 1980s. In 1979, 130 Bangladeshi employees were trained in textile technology in Korea. Over the next several years, 115 employees began their own textile plants. This process was made easier by a relatively strong financial market that was able to provide loans to many of the former employees. Alfaro *et al.* (2004) suggested that this was a contributing factor in increasing the export value of the Bangladeshi textile industry from $55,000 in 1980 to over $2 billion by the year 2000. In their analysis, they found that countries were most likely to benefit from FDI when they had strong financial markets that were capable of lending activities.

Finally, the effect of FDI on economic growth may depend on the degree to which countries export their goods (Balasubramanayam *et al.*, 1996). According to Bhagwati (1978), countries can follow either an export-promoting (EP) strategy or an import-substituting (IS) strategy. An EP strategy is relatively market-neutral, having little to no regulatory provisions. Countries relying on an IS strategy, however, intervene in free-market mechanisms, using tariffs and trade quotas to regulate the market. Hence, corporations in EP countries have a greater ability to control the production and export of their goods, and they attract a higher volume of FDI (Bhagwati 1978; Balasubramanayam and Salisu, 1991; Balasubramanayam *et al.*, 1996). Import substitution countries, however, seek FDI to lessen their reliance on imports. While this can appear beneficial from the IS country's perspective, the investors of FDI are constrained in where the completed goods can be sold. By being limited to the domestic market where the FDI is invested, the investors are subjected to the potential inefficiencies and instabilities of the domestic market. When negative changes in the domestic market occur, FDI investors are limited in how much of their product they can export. Therefore, not only are IS countries less likely to receive FDI, how it can be used is less likely to promote growth (Bhagwati, 1978; Bhagwati and Srinivasan, 1975; Balasubramanayam and Salisu, 1991; Balasubramanayam *et al.*, 1996; Greenaway and Nam, 1988). However, because free market forces are at work in EP countries, FDI can encourage research and development and investment in human capital as competition between foreign and domestic firms is likely to occur (Balasubramanayam *et al.*, 1996). This can promote economic growth (Romer, 1993). In an

analysis of 46 countries, Balasubramanayam *et al.* (1996) found that FDI promoted economic growth in EP countries but not in IS countries. Although economic growth is more likely to occur under export-promoting policies, both export-promoting and import-substituting policies have held prominent roles in a country's economic development plans (Sit, 2001).

Overall, foreign direct investment has been linked with economic growth under several conditions. It has been found to spur growth when the receiving country has an educated population, when the technology gap between the sending country and the receiving country is at a minimum, when the receiving country has an adequate financial market with the ability to engage in lending activity, and when the economic policy of receiving countries does not limit the ability of firms to export their products (Alfaro *et al*., 2000; Balasubramanyam *et al*., 1996; Blomström *et al*., 1994; Borensztein *et al*., 1998; Carkovic and Levine, 2005; De Gregorio, 1992; Hermes and Lensink, 2003; Li and Liu, 2004). Some scholars, however, have found that FDI has an overall positive effect on economic growth regardless of the conditions under which FDI investment occurs (Bengoa and Sanchez-Robles, 2003; Campos and Kinoshita, 2002). The promotion of economic growth is one mechanism through which foreign direct investment can impact homicide rates according to the propositions of modernization theory (Durkheim 1951 [1897]; 1984 [1902]; 1997 [1893]; Shelley 1981). Another mechanism through which foreign direct investment can impact homicide rates is increased urbanization.

The Relationship between Foreign Direct Investment and Urbanization

Foreign investment can increase urbanization by attracting individuals into cities in search of employment. The rural-urban migration patterns that characterize many less-developed countries have been attributed to political and economic causes since the mid-nineteenth century. Marx (1992 [1867]) suggested that the industrialization of the mid-1800s promoted migration because the rise of factories produced numerous job opportunities for individuals. Laws that limited land use and appropriated land away from agricultural workers further contributed to population shifts. Durkheim (1951 [1897]; 1984 [1902]; 1997 [1893]) and Shelley (1981) also suggested that urbanization was a consequence of modernization. According to Shelley (1981), when countries industrialize they rely less on agriculture and more on

manufacturing and service industries. This causes rural residents to migrate to urban centers in search of employment. Indeed, Hoselitz (1960) suggested that urbanization was an inevitable result of modernization and foreign investment.

Empirical evidence provides support for the proposition that foreign investment increases urbanization (London, 1987; London and Smith, 1988; Sit and Yang, 1997; Zhu *et al*., 2012; Sit, 2001). London (1987) found that the economic penetration by multinational corporations into domestic markets was associated with greater urbanization – measured as the percentage of the population residing in urban areas. In a later analysis, London and Smith (1988) again examined the relationship between foreign investment/dependency (multi-national penetration) and development. They defined foreign investment as the ratio of capital controlled by FDI to the total capital multiplied by the population. In their analysis of 103 nations, London and Smith (1988) found that multi-national penetration increased urban bias which measured the ratio of the output of workers in non-agricultural sectors of the economy to the output of workers in agricultural sectors of the economy. While urban bias is not an explicit measure of urbanization, it does capture the degree to which multi-national penetration shifts the economic output of a country from the agricultural to the non-agricultural/industrial sector. Concomitant with greater output in non-agricultural sectors is the transition from agrarian to non-agrarian forms of production. The greater output can be attributed to the migration of individuals from rural to urban areas where non-agricultural industries are predominately located.

Several studies on FDI and urbanization focused on the manifestation of this relationship in the People's Republic of China (PRC) where urbanization rapidly increased during the 1980s and 1990s. Sit and Yang (1997) argued that foreign investment was an important correlate of urbanization – one that has only recently begun with the expansion of economic globalization. They labeled the new form of FDI-dependent urbanization 'exo(genous)-urbanization' and examined how exo-urbanization occurred in the Pearl River Delta of the PRC. Located in Guangdong province and bordering the South China Sea, the Pearl River Delta has been the recipient of large amounts of foreign investment since the PRC instituted a series of economic reforms in 1978. These reforms introduced capitalist market principles and allowed foreign investment into the PRC. Since then, the effects on the

Pearl River Delta have been dramatic. Sit and Yang (1997) found that much of the early foreign investment was in export-oriented manufacturing. This caused the region to transition from agrarian and rural to industrial and urban in a relatively short period. In 1978, only 13.2 percent of the population in the Pearl River Delta lived in an urban area. By 1993, it had increased to over 40%. While early FDI was placed in manufacturing, much of the investment is now placed in infrastructure, transport, energy, and real estate. The expansion of foreign investment into more sectors provided more employment opportunities and produced greater migration. Sit and Yang (1997) concluded that foreign investment was the most important determinant of urbanization in the Pearl River Delta.

Zhu *et al.* (2012) reached a similar conclusion, noting that the Pearl River Delta region of the PRC continued to experience exponential growth. Between 1997 and 2010, cities within Guangdong province experienced population increases of 50% to 100%. By 2010, three cities in the delta had a population of over five million people. Between 1980 and 2010, Shenzhen experienced the most dramatic growth. Its urban population was 60,000 in 1980, 6.07 million in 2000, and 9.83 million in 2010. The rise of the city has been almost entirely attributed to exo-urbanization driven by foreign investment.

Hypotheses

Based on the preceding review of the literature, the following three hypotheses were tested.

H1: Inward foreign direct investment is positively associated with national homicide rates.

H2: Inward foreign direct investment is positively associated with growth in gross domestic product.

H3: Inward foreign direct investment is positively associated with urbanization.

DATA AND METHOD

Data

The first dependent variable is a country's intentional homicide rate per 100,000 people. Data were collected from two sources. The first source is the World Bank's World Development Indicator, DataBank, which compiles and distributes homicide data provided to them by the United Nations Office on Drugs and Crime. Intentional homicides are defined by the United

Nations as "homicides purposely inflicted as a result of domestic disputes, interpersonal violence, violent conflicts over land resources, intergang violence over turf or control, and predatory violence and killing by armed groups (World Bank, 2023)." The second source is the World Health Organization. Homicide data collected by the WHO are based on official death certificates from local health organizations (Huang, 2001). They are defined as being "purposely inflicted by other persons" and comprise mortality categories X85-Y09 of the International Classification of Diseases (ICD) codes (World Health Organization, 2023). Data were obtained from both sources for the period 1992 to 2020. This produced a sample of 101 nations from the World Bank and 77 nations from the World Health Organization (see Appendix for a list of countries). To reduce skewness, the natural log of the homicide rate was used.

There are two additional dependent variables. *Percent urban* measures the percentage of residents living in urban areas as defined by national statistical offices, and *GDP growth per capita* measures annual growth in gross domestic product. *Percent urban* and *GDP growth per capita* serve as dependent variables to test Hypotheses 2 and 3 which state that inward FDI is associated with increased urbanization and GDP growth. Data were obtained from the World Bank (2023).

Several independent variables were included in the analysis. *Inward foreign direct investment* measures net inflows of direct investment made by non-residents and is calculated as a percentage of gross domestic product (GDP). Data were obtained from the World Bank (2023). *Infant mortality* is measured as the number of deaths per 1,000 live births. It is often included in cross-national studies as a proxy for poverty or inequality (Frey and Field, 2000; Levchak, 2016; Messner, Raffalovich, and Sutton, 2010; Pridemore, 2008). Data were collected from the United Nations Population Division. The strength of democracy is measured by including four binary variables: *high-performing democracy*, *mid-range performing democracy*, *weak democracy*, and *hybrid regime*. Authoritarian regimes serve as the omitted category. It is important to consider the political structure of a nation because democratic policies have been shown to reduce homicide (Neumayer, 2003). Data on the strength of democracy were downloaded from The International Institute for Democracy and Electoral Assistance (International IDEA, 2023). *Percent male 15-29* measures the percent of the

population that was male and between the ages of 15 and 29. Data were obtained from the United Nations Population Division. *Gender parity* measures the ratio of women to men enrolled in tertiary education. Data were obtained from the World Bank. *Unemployment* measures the percentage of the population age fifteen and older who is out of work but seeking employment. Data were collected from the International Labour Organization (ILO). Missing data were modeled and filled via imputation by the ILO. *Household consumption* measures the level of household consumption relative to the price of the United States gross domestic product (standardized to 2017 dollars). As such, it is a measure of economic prosperity. *Human capital* measures the return on education based on average years of schooling, with the expectation that greater returns will be associated with lower rates of homicide. Household consumption and human capital data were obtained from the Penn World Tables. *Labor share of income* measures the ratio of national income allocated to labor. Finally, data on *population density* were obtained from the World Bank. Population density was included to control for close contact with others which could precipitate aggression and homicide (Cohen and Felson, 1979; Krahn, Hartnagel, and Gartrell, 1986). Except for *high-performing democracy*, *mid-range performing democracy*, *weak democracy,* and *hybrid regime*, all independent variables were log-transformed to reduce skewness.

Method

To test hypotheses one through three, time-series cross-sectional (TSCS) data were used. TSCS data are quantitative in nature and are characterized by repeated observations (e.g. monthly or annually) of covariates by group (e.g. state or country) (Beck and Katz 1995). The following TSCS model was analyzed:

$$y_{it} = X_{it}\beta + e_{it} \text{ where } i = 1, \ldots, N; t = 1, \ldots, T$$

Where *y* is the value of the dependent variable for nation *i* at time *t*, **X** is a vector of coefficients for the explanatory variables of nation *i* at time *t*, and *e* is the error term for nation *i* at time *t*. Based on the hypotheses of this study, three dependent variables are examined – *homicide*, *percent urban*, and *GDP growth per capita*.

Because TSCS data are characterized by repeated observations, they are often plagued by serial correlation. This can produce incorrect standard errors

and may lead to invalid inferences from the obtained *t*-statistics. Heteroscedasticity within panels is also a concern. This occurs when errors are not constant across observations, and it can also produce incorrect standard errors that lead to invalid inferences. To account for the presence of serial correlation and heteroscedasticity, Prais-Winsten regression models with standard errors corrected for heteroscedasticity and first-order autocorrelation were estimated using Stata's *xtpcse* command. To avoid potential issues related to endogeneity, all values of the independent variables were lagged by one year.

RESULTS

Descriptive statistics are presented in Table **1**. Although most variables were log-transformed for the analysis, Table **1** displays the untransformed mean, standard deviation, minimum value, and maximum value for each variable.

Table **2** displays the results of the Prais-Winsten regression models that estimate the effect of inward foreign direct investment on World Bank homicide rates and World Health Organization homicide rates (Hypothesis 1). They show that inward foreign direct investment has a significant, positive association with homicide rates when using World Bank Data and a non-significant, albeit positive, association when using WHO data. For several of the other variables, the models produce similar results. Infant mortality and gender parity are associated with higher rates of homicide across both models. Percent urban, a key variable according to modernization theory, exhibits a significant and positive association with both measures of homicide. GDP growth per capita, another key variable of modernization theory, is not significantly associated with homicide in either model.

Table **3** displays the results of the Prais-Winsten regression models that estimate the effect of inward foreign direct investment on percent urban and GDP growth per capita (Hypotheses 2 and 3). Inward foreign direct investment has a significant, positive association with both percent urban and GDP growth per capita.

DISCUSION AND CONCLUSION

Although some studies examine how globalization and various trade measures impact cross-national homicide rates (see LaFree and Jiang, 2023; Levchak, 2015), the role of inward foreign direct investment (inward FDI) has been neglected. However, Levchak

Table 1: Descriptive Statistics

Variables	Number	Mean	SD	Min	Max
World Bank homicide rate	3442	8.38	12.75	0.01	141.72
WHO homicide rate	2437	6.66	10.19	0.01	86.34
Inward foreign direct investment	5230	7.95	56.51	-1303.13	1709.77
GDP growth per capita	5729	1.92	5.98	-54.64	140.37
Percent urban	6196	57.62	24.49	6.82	100.00
Infant mortality	6552	39.76	46.49	1.52	408.69
High performing democracy	4898	0.11	0.32	0	1
Mid-range performing democracy	4898	0.30	0.46	0	1
Weak democracy	4898	0.18	0.39	0	1
Hybrid regime	4898	0.12	0.33	0	1
Percent male 15-29	6452	12.59	2.57	3.40	37.34
Gender parity	2995	1.04	0.35	0.06	1.87
Unemployment	5580	8.28	6.29	0.10	38.80
Household consumption	4509	0.51	0.57	0.08	23.12
Human capital	3753	2.46	0.70	1.04	4.35
Labor share of income	3394	0.52	0.12	0.09	0.92
Population density	6233	399.51	1848.64	0.14	21388.60

Table 2: Prais-Winsten Regression Models of World Bank Homicide and WHO Homicide

Variables	World Bank Homicide		WHO Homicide	
	B	*SE*	*B*	*SE*
Inward foreign direct investment	0.07*	0.03	0.01	0.02
GDP growth per capita	-0.02	0.01	-0.00	0.02
Percent urban	1.16***	0.19	2.29***	0.33
Infant mortality	1.28***	0.11	1.58***	0.14
High performing democracy	0.72***	0.10	0.29	0.18
Mid-range performing democracy	0.89***	0.09	0.54**	0.17
Weak democracy	0.80***	0.18	0.70***	0.16
Hybrid regime	0.53***	0.10	0.43**	0.14
Percent male 15-29	0.52	0.35	0.16	0.50
Gender parity	0.70***	0.13	1.83***	0.35
Unemployment	-0.09	0.07	-0.41***	0.08
Household consumption	-0.09	0.10	-0.06	0.15
Human capital	1.43***	0.32	0.30	0.35
Labor share of income	0.30	0.27	1.02**	0.35
Population density	-0.37***	0.04	-0.20***	0.05
Constant	-6.13***	1.51	-10.65***	2.04
Number of observations	1181		1000	
Number of countries	101		77	
Average observations per group	11.69		12.99	
First year	1992		1992	
Last year	2020		2020	

Note: *** p<.001, ** p<.01, * p<.05.

Table 3:   Prais-Winsten Regression Models of Percent Urban and GDP Growth

Variables	Percent Urban		GDP Growth	
	B	*SE*	*B*	*SE*
Inward foreign direct investment	0.02***	0.00	0.04*	0.02
GDP growth per capita	-0.00	0.00	-	-
High performing democracy	0.43***	0.03	-0.93***	0.10
Mid-range performing democracy	0.23***	0.03	-0.47***	0.11
Weak democracy	0.07***	0.02	-0.58***	0.10
Hybrid regime	0.05**	0.02	-0.66***	0.13
Constant	3.68***	0.02	1.60***	0.07
Observations	4342		4295	
Number of countries	168		165	
Average observations per group	25.85		25.41	
First year	1976		1976	
Last year	2020		2020	

Note: *** $p<.001$, ** $p<.01$, * $p<.05$.

(2019) argued that it is one of the most logical trade measures to include in an analysis of cross-national homicide rates. Inward foreign direct investment measures net inflows of investment from foreign corporations into domestic markets. Thus, nations that experience high levels of inward FDI are experiencing high levels of investment into domestic firms by foreign developers and corporations. As prior research has shown, inward FDI is associated with increased economic growth and increased urbanization (Alfaro *et al*., 2000; Balasubramanyam *et al*., 1996; Blomström *et al*., 1994; Borensztein *et al*., 1998; Carkovic and Levine, 2005; De Gregorio, 1992; Hermes and Lensink, 2003; Li and Liu, 2004; London, 1987; London and Smith, 1988; Sit and Yang, 1997; Zhu *et al*., 2012; Sit, 2001). Both economic growth and urbanization are commonly used as predictors of cross-national homicide rates, particularly in studies that are based on modernization theory (Clement *et al*., 2019; Currie, 1997; Levchak, 2015; Levchak, 2016; Neumayer, 2003; Ortega *et al*., 1992; Shelley, 1981). Thus, this study sought to test the propositions of Levchak's (2019) revision to modernization theory that inward FDI would be associated with increased rates of homicide and that inward FDI would indirectly impact homicide via increased economic growth and urbanization.

The results of this study show that inward foreign direct investment is significantly and positively associated with cross-national homicide rates in one of the two regression models. The results also show that inward foreign direct investment is associated with

increased economic growth in the form of GDP growth per capita and increased urbanization in the form of percent urban. Because there is a main effect of urbanization on homicide rates, the results show that inward foreign direct investment indirectly increases homicide rates by increasing urbanization. Although inward foreign direct investment does lead to increased GDP growth, there is no significant effect of GDP growth on homicide rates. Therefore, these findings are partially consistent with both modernization theory (Durkheim 1951 [1897], 1984 [1902]; Shelley, 1981) and Levchak's (2019) revised version of modernization theory. Notably, inward foreign direct investment is directly associated with cross-national homicide rates and indirectly associated with cross-national homicide rates via increased urbanization.

Further evidence of this is shown in Table **4** which displays average urbanization and average homicide rates by quartile of inward FDI, urbanization, and change in urbanization. The patterns illustrate the results produced by the regression analyses that are reported in Tables **2** and **3**. For example, Table **4** shows that the percentage of residents living in urban areas increases as inward FDI increases – from a low of 62% of residents residing in urban areas when inward FDI is low to a high of 72% of residents when inward FDI is high. Similar patterns exist when looking at the homicide rate. The highest rates of homicide are found when inward FDI is relatively high (the third quartile). Likewise, homicide rates are quite high when urbanization is relatively high (the third quartile). It

Table 4:   Urbanization and Homicide Rate by Inward FDI and Urbanization Quartiles

Inward FDI by Quartile	Urbanization
First quartile (FDI < 2.28)	61.66%
Second quartile (2.28 ≤ FDI < 3.44)	65.87%
Third quartile (3.44 ≤ FDI < 5.30)	64.04%
Fourth quartile (FDI ≥ 5.30)	71.55%
Inward FDI by Quartile	**Homicide Rate**
First quartile (FDI < 2.28)	4.02 per 100,000
Second quartile (2.28 ≤ FDI < 3.44)	5.30 per 100,000
Third quartile (3.44 ≤ FDI < 5.30)	9.17 per 100,000
Fourth quartile (FDI ≥ 5.30)	4.36 per 100,000
Urbanization by Quartile	**Homicide Rate**
First quartile (urbanization < 54.96)	7.99 per 100,000
Second quartile (54.96 ≤ urbanization < 68.08)	4.91 per 100,000
Third quartile (68.08 ≤ urbanization < 80.23)	7.65 per 100,000
Fourth quartile (urbanization ≥ 80.23)	2.91 per 100,000
Change in Urbanization by Quartile	**Homicide Rate**
First quartile (urbanization < 1.74)	4.82 per 100,000
Second quartile (1.74 ≤ urbanization < 4.30)	3.82 per 100,000
Third quartile (4.30 ≤ urbanization < 7.60)	3.84 per 100,000
Fourth quartile (urbanization ≥ 7.60)	10.90 per 100,000

should be noted that homicide rates are reduced at very high levels of inward FDI and urbanization. This is consistent with the theoretical arguments set forth by Durkheim (1951 [1897], 1984 [1902]) and Shelley (1981). Both note that homicide should be reduced when the infrastructure of a city can accommodate the influx of new residents. It is only during the transition phase that rates of homicide should be elevated. To illustrate this, the last four rows of Table **4** show the homicide rate by quartile of changes in urbanization. Thus, countries whose urban populations remained stable are represented in the first quartile, while countries whose urban populations increased significantly are represented in the fourth quartile. Consistent with modernization theory, countries that had the largest increase in percent urban (≥ 7.60 percentage points) also had the highest average homicide rate at 10.90 per 100,000 population.

While increased homicide is certainly a negative effect of inward foreign direct investment, inward foreign direct investment has many positive effects. Most importantly, it is associated with economic growth which has benefited people by providing employment, improving nutrition, lowering rates of infant mortality, and raising life expectancies. (Alfaro *et al*., 2000;

Balasubramanyam *et al*., 1996; Brady, Kaya, and Beckfield, 2007; Carkovic and Levine, 2005; Firebaugh and Beck, 1994; Hermes and Lensink, 2003; Li and Liu, 2004). Therefore, it is likely unwise to suggest that nations should limit the amount of inward foreign direct investment they receive. Rather, it may be prudent to focus on the indirect mechanism by which homicide is increased. Nations can work to protect themselves from the deleterious effects of rapid urbanization. Nations that do receive substantial sums of foreign investment should attempt to improve the infrastructure of their urban areas, ensure there is access to affordable housing programs and education, and they should provide programs that foster social inclusion (Shelley, 1981).

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

While this study advances the literature on modernization theory it is not without its limitations. Cross-national research is highly dependent on the availability of data. Smaller nations and African nations are often excluded from research because the data are either unavailable or incomplete. The same is true here. This is unfortunate because those same nations

often receive a substantial amount of inward foreign direct investment as a percentage of GDP (World Bank, 2023). Given their exclusion, the generalizability of these results may be somewhat limited. Future researchers will hopefully be able to benefit from more complete data. Future researchers will also want to think about other ways in which globalization and trade can impact cross-national homicide rates. There are an abundance of trade measures and globalization indicators available. While it does not necessarily make sense to examine each one, researchers should consider the theoretical relevance of the indicators and the mechanisms through which they could impact cross-national homicide rates. If they are theoretically sound, they should be empirically examined.

APPENDIX: LIST OF NATIONS

Argentina	Honduras	Paraguay
Armenia	Hungary	Peru
Australia	Iceland	Philippines
Austria	India	Poland
Bahrain	Indonesia	Portugal
Barbados	Iran	Qatar
Belgium	Ireland	Romania
Benin	Israel	Russian Federation
Botswana	Italy	Rwanda
Brazil	Jamaica	Saudi Arabia
Bulgaria	Japan	Senegal
Burkina Faso	Jordan	Serbia
Burundi	Kazakhstan	Singapore
Cameroon	Kenya	Slovak Republic
Canada	Kuwait	Slovenia
Chile	Kyrgyzstan	South Africa
China	Latvia	South Korea
Colombia	Lesotho	Spain
Costa Rica	Lithuania	Sri Lanka
Croatia	Luxembourg	Sweden
Cyprus	Malaysia	Switzerland
Czech Republic	Malta	Tajikistan
Denmark	Mauritius	Tanzania
Dominican Republic	Mexico	Thailand
Ecuador	Moldova	Trinidad and Tobago
Egypt	Mongolia	Tunisia
Estonia	Morocco	Turkey
Eswatini	Mozambique	Ukraine
Fiji	Namibia	United Kingdom
Finland	Netherlands	United States
France	New Zealand	Uruguay
Germany	Niger	Venezuela
Greece	Norway	Zimbabwe
Guatemala	Panama	

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