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Abstract

This paper uses econometric methodology to determine whether total remittances received and remittance dependency (measured as the percentage of GDP which comes from remittances) affect homicide, theft, and burglary rates. The paper is made up of a broad literature review, the formulation of a new theoretical framework which explains how remittances have a two-pronged effect on crime, by way of social remittances and economic remittances, followed by an in-depth explanation of each variable, and finally the regression results obtained using R. Economic remittance dependency creates demand for education as migrants are required to educate themselves or their children in order to access steady revenue streams; education overall ends up reducing crime rates even if the people who are not educated ultimately do not leave the country.

Four different regression estimators are used: pooled OLS, time fixed effects, country fixed effects, and the between model. Initial results with the pooled OLS were promising but encompassed too much heteroskedasticity. To alleviate heteroskedasticity and address endogeneity issues, fixed effects and the between estimator were used. Time fixed effects can be interpreted as region-wide trends whilst the between estimator is useful for examining long-term relationships between variables. Time fixed effects and the between estimator show significant results, in the form of remittance dependency increasing homicide rates and decreasing theft rates. Other control variables which affect crime rates were also included such as GDP per capita, strength of democracy, state effectiveness and legitimacy, unemployment rate, the size of the country's largest export industry, and whether the country is part of a drug corridor. Results show that inequality increases violent crime rates, whilst democracy decreases homicide and theft and increases burglary rates. Poor countries also display an increase in theft rates but lower homicide and burglary rates. Overall, the paper's main result is that remittance dependency leads to lower theft rates and higher homicide rates, although the latter result may be due to endogeneity within the model.

Abstrakt

In diesem Papier wird mit Hilfe ökonometrischer Methoden untersucht, ob die Gesamtzahl der erhaltenen Rücküberweisungen und die Abhängigkeit von Rücküberweisungen (gemessen als Prozentsatz des BIP, der aus Rücküberweisungen stammt) die Mord-, Diebstahl- und Einbruchsraten beeinflussen. Das Papier besteht aus einem umfassenden Literaturüberblick, der Formulierung eines neuen theoretischen Ansatzes, der die Effekte von Rücküberweisungen auf die Kriminalität erklärt, und zwar durch soziale Rücküberweisungen und wirtschaftliche Rücküberweisungen, gefolgt von einer ausführlichen Erklärung jeder Variable und schließlich den mit R erzielten Regressionsergebnissen.

Es werden vier verschiedene Regressionsschätzer verwendet: gepoolte OLS, zeitfixierte Effekte, individuelle fixe Effekte und das Between-Modell. Die ersten Ergebnisse mit dem gepoolten OLS Panelansatz waren vielversprechend, enthielten aber zu viel Heteroskedastizität. Um die Heteroskedastizität zu verringern und Endogenitätsprobleme zu lösen, wurden feste Effekte und der Between-Schätzer verwendet. Zeitlich fixe Effekte können als regionsweite Trends interpretiert werden, während der Between-Schätzer für die Untersuchung langfristiger Beziehungen zwischen Variablen nützlich ist. Zeitlich fixe Effekte und der Between-Schätzer zeigen signifikante Ergebnisse in der Form, dass die Abhängigkeit von Überweisungen die Mordrate erhöht und die Diebstahlsrate senkt. Andere Kontrollvariablen, die sich auf die Kriminalitätsrate auswirken, wurden ebenfalls einbezogen, wie z. B. das Pro-Kopf-BIP, die Stärke der Demokratie, die Effektivität und Legitimität des Staates, die Arbeitslosenquote, die Größe der größten Exportindustrie des Landes und die Tatsache, ob das Land zu einem Drogenkorridor gehört. Die Ergebnisse zeigen, dass Ungleichheit die Gewaltverbrechensrate erhöht, während Demokratie die Mord- und Diebstahlsrate senkt und die Einbruchsraten erhöht. Auch in armen Ländern steigen die Diebstahlsraten, während die Mord- und Einbruchsraten sinken. Insgesamt ist das Hauptergebnis der Studie, dass die Abhängigkeit von Überweisungen zu niedrigeren Diebstahl- und höheren Mordraten führt, obwohl das letztgenannte Ergebnis möglicherweise auf Endogenität innerhalb des Modells zurückzuführen ist.

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Finally, I want to thank my family and friends for providing a support network which allowed me to pursue a master's degree in International Relations whilst making my time in Vienna enjoyable.

On my honor as a student of the Diplomatic Academy of Vienna, I submit this work in good faith and pledge that I have neither given nor received unauthorized assistance on it.

DANIEL STARR TENORIO

Introduction

Latin America is a region which has seen tremendous quality of life improvements over the past century, such as a 5-fold increase in GDP per capita since 1900 to 2000, and an increase of literacy rate from 25% to almost 90%.¹ However, the economic reality of the continent has not fared as well, as the countries have not all yet become as developed as their northernmost neighbors, and the region still remains one of the most dangerous in the world, with some of the countries having annual homicide rates of over 30 per 100,000 inhabitants.² The socioeconomic realities of the region have forced many migrants to seek higher incomes in developed labor markets and these migration flows have been an important part of Latin American foreign policy since the 1980s; approximately 32.5 million people from Latin America were migrants in 2013.³ Migrants bring about with them an important economic mechanism, remittances, which is the money they send to their families, friends, or communities in their home countries. This paper will explore whether these remittances affect crime rates in Latin America, specifically theft, burglary, and homicide.

The motivation for this paper is Amartya Sen's book *Development as Freedom*, where the author talks about how freedom must be the means and end of any development efforts.⁴ Crime is an important deterrent to personal freedom, Despite the economic benefit brought on by remittance flows, it is important to understand whether these adversely or positively affect people's freedom from crime. By examining the relationship between remittances and crime, it could be possible to see that an inflow of these either increases crime or decreases it; understanding this mechanism could substantially impact the development of Latin American countries.

Due to the nature of studying crime and international money flows, this paper undertakes a multifaceted approach involving law, international relations, sociology, and economics, as such there could be diverse interpretations of the results found. This topic is of utmost importance to Latin American countries because their foreign policies vis-à-vis developed countries are largely contingent on their migration flows. Deepening our understanding of how remittances affect crime can help shape Latin American countries' foreign and domestic remittance policies to impact

¹ Rosemary Thorp, *Progress, Poverty and Exclusion: An Economic History of Latin America in the 20th Century* (Washington, D.C. : Baltimore, MD: Inter-American Development Bank ; Distributed by The Johns Hopkins University Press for the Inter-American Development Bank and the European Union, 1998).

² UNODC, "Homicide Country Data | DataUNODC," 2022, <https://dataunodc.un.org/content/homicide-country-data>.

³ Roy Germano, *Outsourcing Welfare: How the Money Immigrants Send Home Contributes to Stability in Developing Countries* (New York: Oxford University Press, 2018). 73

⁴ Amartya Sen, *Development as Freedom* (Oxford ; New York: Oxford University Press, 2001). 18

human security within their borders. Furthermore, crime rates in Latin America also significantly affect the countries' perceptions abroad and so any instrument which could affect criminality is of interest to all stakeholders.

The analysis to be undertaken within this field is difficult due to the dynamics of how the remittance cycle is structured. It is typically the (most) skilled worker who leaves their family to go work in a more developed market and send money to them, which can have serious consequences on the labor market and economic development of the home country (hereafter, "home country" will mean the country where the remittances are sent to, even if the migrant has not lived there for a long time). Following that, the inflow of money on the developing country can have a profound impact on the socioeconomic realities of the country, as family members of the migrant could become considerably wealthier than before. As a result, the act of a remittance being sent from a migrant to their family can have multiple effects on the crime rate of a country and it is difficult to pinpoint exactly which action is more influential on the socioeconomic conditions of the home country: either the migrant leaving or the remittance flows coming into the home country.

Remittances hold one of the most important economic and political controls of Latin American politics, especially for the countries in Central America which have seen enormous numbers of migrants heading to the United States in recent years. One of the reasons these remittances are so crucial is that they are sent from labor markets often unaffected by the crises and economic cycles of the migrant's home country, meaning that income is guaranteed and does not rely on the home country's political stability or any economic volatility such as the downturns in agricultural cycles caused by natural disasters.⁵

An important motivation for this paper is that volume of remittances received worldwide is approximately 3 times larger than the amount of foreign aid, yet the literature on the latter is more developed than for the former when it pertains to these money flows' impact on crime.⁶ Despite the existing studies on foreign aid and crime, it must be noted that it is different than the one developed in this paper, as those studies analyze how foreign aid affects crime through a top-down

⁵ Germano, *Outsourcing Welfare: How the Money Immigrants Send Home Contributes to Stability in Developing Countries*. 1

⁶ Kate Ambler, Diego Aycinena, and Dean Yang, "Channeling Remittances to Education: A Field Experiment among Migrants from El Salvador," *American Economic Journal: Applied Economics* 7, no. 2 (April 1, 2015): 207–32, <https://doi.org/10.1257/app.20140010>.

approach, as it is the government that is able to redirect those funds to formal justice institutions which in turn affect the criminality in the country.⁷ In turn, this paper analyzes the relationship from the bottom-up approach, how remittances affect the citizens directly.

To properly analyze the effect that remittances have on crime rates, it will also be important to note the control for the effect that other socioeconomic variables have on crime rates, such as GDP per capita (and particularly for poor countries), unemployment, and market structure dynamics such as which industry is the largest in the country and how much of the GDP is captured by that industry, amongst other variables.

The flaws with this research are clear, as it can be either remittances which affect crime or the other way around. It is a daunting task and so the existing literature on these variables' connection has not been developed too much, nevertheless it is still worth exploring and developing the literature even by basing the analysis on existing theoretical frameworks which do not concern crime and remittances but instead are focused on other socioeconomic effect of remittances. The premise for this research is that people migrate due to economic conditions (which may be confounded or caused by social conditions) and then when they send money back to their home countries, this money may have an impact on crime rates. The paper incorporates econometric methods that account for the endogeneity present in migration studies such as this, such as the time fixed effect and between models.

The main hypothesis in this paper is that migrants send remittances based on economic need and, whilst crime rates in the home country may affect the amount of money they send, economic needs of family members are more important. Following the receipt of these remittances, Latin American families form a dependency on remittances and focus on investing in the next generation's education to send the future laborers abroad with better job prospects. Furthermore, there is a concept of social remittances which mentions that remittances are not only monetary, but they also include ideas and practices from the country where the migrant lives, which typically tend to be less tolerant of crime and other social injustices than those in the home country.⁸ The education in turn will reduce the criminality rates in the long term as the discount rate for

⁷ International Council on Human Rights Policy, ed., *Local Perspectives: Foreign Aid to the Justice Sector* (Versoix: International Council on Human Rights Policy, 2000).

⁸ Peggy Levitt and Deepak Lamba-Nieves, "Rethinking Social Remittances and the Migration-Development Nexus from the Perspective of Time," *Migration Letters* 10, no. 1 (January 1, 2013): 11–22,

committing crimes will be too high and families will focus on their education instead, in order to obtain remittances.⁹

This paper surveys the existing literature on the impact of remittances on socioeconomic realities of countries, and then further dives into how it may affect the crime rate, generally and in Latin American countries specifically. After surveying the existing literature, the paper establishes a theoretical framework which will outline the causation mechanisms between the chosen variables and provides an explanation for the reasoning as to why crime and remittances. This theoretical framework is built to address issues of endogeneity and provide an argument as to why remittances have a crime-reducing effect. Following the theoretical framework, the paper delves into the econometric models upon which the paper is based upon, and which test whether remittances have an impact on crime rates.

There are 24 econometric regressions utilized, as it is important to test the differences between different data estimators, such as time and country fixed effects, pooled ordinary least squares (henceforth OLS), and the between model. The wide array of models utilized is done so in order to reduce endogeneity and also to see whether there are significant outcomes when interpreting the data in a different manner.

The variables included will not only be of crime and remittance nature but will also include control variables to see whether there are different effects on countries with different economic structures. Furthermore, the models outline that crime is to be measured in different ways, homicide, theft, and arm seizures, all of which could be affected differently due to remittances. In order to control for heteroskedasticity which is present in the OLS regressor, the fixed effects and between models were utilized.

Initial results show that, for the region as a whole, homicides increase as remittances increase whilst theft decreases as remittance dependency increases. The time fixed effect model also shows that as total remittances increase, burglary decreases. Furthermore, this paper outlines other significant takeaways regarding the control variables utilized.

Finally, the paper is concluded with an analysis section that includes graphs and tables with the results from the panel regressions that were ran utilizing statistical software (RStudio).

⁹ Stephen Machin, Olivier Marie, and Sunčica Vujić, “The Crime Reducing Effect of Education,” *Institute for the Study of Labor (IZA) Discussion Paper Series*, 5000, June 2010, 38.

Literature review

The literature surveyed for this paper was selected due to its extensive work on the field of remittances and migration. There has not been much written, either in Latin American or Western academia, about the effect that remittances may have on criminality. As such, the books and articles which were surveyed provide an overview of the effect that remittances have on other factors such as education, labor markets, and their economic importance for developing countries. These existing studies then make up the bulk of the theoretical framework which establishes that, due to their steady stream of income, remittances have a crime reducing effect in Latin America as the residents of these countries have an alternative to crime. Furthermore, the promise and dependency on potential revenue streams means that people will become more educated. Even if, ultimately, these do not migrate to more developed and economically stable countries, the education achieved provides an alternative for crime and might alter the incentives for criminality.

Collier in *Exodus: How Migration is Changing Our World* focuses on the political and economic effects felt in developed countries in after migration episodes from the developing world to the developed.¹⁰ The author notes that those most likely to migrate are those which were persecuted before, whereas those in power tend to remain in the country of origin and do not seek to emigrate for better economic prospects. This phenomenon can lead to diasporas supporting initiatives in their home country which could improve the conditions of those they left behind, as the migrants are in a safe haven and can exert their influence on the politics of the home country. The author notes that the effect of governance and migration can verge on the tautological, as poor governance can lead to migration, but migration can also affect the quality of governance.¹¹

Collier also notes that one of the consequences of migration is that the ones who leave their country are usually the most skilled as they will be able to find work in the developed world more easily, leading to a “brain drain”, which means that more productive individuals who would pay higher taxes are no longer contributing to the government revenue directly.¹² He notes that education is key in this, as a better education will result in better chances of emigrating and maintaining a steady flow of remittances to the home country, which counteracts the “brain drain”

¹⁰ Paul Collier, *Exodus: How Migration Is Changing Our World* (Oxford ; New York: Oxford University Press, 2013). 179

¹¹ Collier. 182

¹² Collier. 196

as there is also an incentive to educate a society but not everyone will be successful at migrating.¹³ It is noted however, that this is contingent upon the size of the country, as larger countries will be able to more successfully replenish their stock of talented workers and will be able to retain these with ease.

Germano in *Outsourcing Welfare: How the Money Immigrants Send Home Contributes to Stability in Developing Countries* talks about the social effects that remittances can have on a country, during times of crises and as a provider of goods that the state would usually have to supply.¹⁴ The book outlines the fact that remittances have an incredibly important economic effect in developing countries, as the formal amount of money sent through remittances opaquely the amount sent as aid by foreign countries. What is meant by formal amount of money is the amount that can be counted through institutions such as Western Union, bank transfers, or mobile applications and does not include informal transfers sent physically via acquaintances or through the mail.¹⁵ Germano notes that when remittances tend to increase when there is a crisis in the home country, as migrants' cash flows are more stable and are not subject to the same economic conditions as in the home country, noting that the same is true for "human-made crisis" such as the upheaval in Yemen between 2011 and 2012.¹⁶ The author notes that in the developed world, citizens and residents enjoy many social welfare nets such as unemployment assistance and security but in the developing world, these assistances are often inadequate or completely void and so remittances help to compensate for the lack of social structures, and act as "transnational safety nets".¹⁷ The reduced economic grievances of the local population mean that there is a reduced risk of civil unrest and greater political stability.

Germano also provides a distinction between different types of remittances, which can be useful to understand the effect that these have in the country. On one hand, there are family remittances from the migrant to their family members in the home country; on the other hand, there are "collective remittances" which are used to fund projects that improve social conditions in the home country, such as building schools and roads in the migrants' villages of origin.¹⁸ It is

¹³ Collier. 197

¹⁴ Germano, *Outsourcing Welfare: How the Money Immigrants Send Home Contributes to Stability in Developing Countries*.

¹⁵ Germano. 5

¹⁶ Germano. 9

¹⁷ Germano. 11

¹⁸ Germano. 19

also argued in the book that the social phenomenon of migration and remittances is often one which follows an economic shock, such as the decrease in prices of a country that is largely dependent on agriculture.¹⁹ Finally, Germano notes that even though remittances are a useful tool for helping bring economic stability to a country's population, it is also contingent upon the remittances being possible, as developed countries may impose harsh migration controls which means that migrants who pay significant sums of money to smugglers end up being deported back to their countries, another factor which may significantly affect the social fabric of a country and affect crime.²⁰

Orozco in *Globalization and Migration: The Impact of Family Remittances in Latin America* notes that remittances are a key part of Latin American economies, as countries like El Salvador have even become dollarized to maximize the utility obtained from these.²¹ The author also notes that remittances are heavily linked with periods of crisis, such as when the agricultural sector suffers a downturn or when the country is embroiled in civil conflict.

Vargas-Silva in *Crime and Remittance Transfers* surveys Colombian residents to analyze the impact of crime on remittance transfers. The author finds that crime has an adverse effect on these transfers and causes remittances to be lower, especially those that are for investment purposes and not self-sustenance.²² Vargas-Silva notes that for the majority of remittances, altruism is usually prescribed as the motive, as people will remit money to their families or communities based on their needs of consumption; consequently, crime may create additional needs and thus increase the amount of remittances.²³ In their microeconomic analysis, the author notes that there are factors which decrease remittance transfers such as better working conditions and then the family owns the house they live in. Overall, crime and remittance transfers are positively correlated before controlling for other variables; once control variables are added, then crime and remittance transfers are negatively correlated.²⁴

Coon in "*Walking ATMS*": *Do Crime Rates Affect Remittances of Mexican Migrants in the United States?* Provides an overview of the effect that crime can have on remittance holders in the United States, i.e., the people who emigrated and now carry cash with them which they intend to

¹⁹ Germano. 38

²⁰ Germano. 150

²¹ Manuel Orozco, "Globalization and Migration: The Impact of Family Remittances in Latin America," *Latin American Politics and Society* 44, no. 2 (2002): 41–66.

²² Carlos Vargas-Silva, "Crime and Remittance Transfers," *Eastern Economic Journal* 35, no. 2 (2009): 232–47.

²³ Vargas-Silva. 236

²⁴ Vargas-Silva. 243

send back to their families.²⁵ The author notes that Mexican immigrants are targeted by criminals in the United States as they are seen as easy victims to mug because they carry cash around with them since they are unable to use bank accounts and use financial intermediaries as many of them are illegal immigrants. He notes that increased robbery (theft from the person) rates will lead to migrants sending money in smaller batches at a lower frequency, whilst increased burglary (theft from their home) rates will cause the migrants to send money in larger batches and at a higher frequency.²⁶

Martí i Puig and Sánchez-Ancochea perform an analysis of Central American development in the recent decades, noting that the region transitioned politically and economically.²⁷ In economic terms, countries became dependent on remittances and started to expand their non-traditional export sectors. However, this transition did not result in socioeconomic improvement necessarily because the inequality in the region is still significant and the gains from export have not been properly transformed into social goods as they have been amassed by the elites.

Briscoe and Martínez explore another interesting aspect related to migration and crime, as in their paper they note that one of the major causes of crime in Latin American countries, particularly in Central America, is deportation from the United States back to the home country.²⁸ In their paper they also note that criminality in countries like El Salvador thrives on extortion to businesses, with as much as USD 756 million being collected annually by criminal organizations and is one of the main reasons behind emigration to safer countries.²⁹

Levitt and Lamba-Nieves in *Rethinking social remittances and the migration-development nexus from the perspective of time* outline that migrant send much more than just economic remittances in the form of social remittances. These social remittances are ideas which can change the values, needs, and mind-frames of non-migrants as they receive ideas from the country that the remittances are being sent from.³⁰ The authors note that these remittances have the potential to

²⁵ Michael Coon, “‘Walking ATMs’: Do Crime Rates Affect Remittances of Mexican Migrants in the United States?,” *Eastern Economic Journal* 41, no. 1 (2015): 6–23.

²⁶ Coon. 22

²⁷ Salvador Martí i Puig and Diego Sánchez-Ancochea, “LA TRANSFORMACIÓN CONTRADICTORIA: DEMOCRACIA ELITISTA Y MERCADO EXCLUYENTE EN CENTROAMÉRICA,” *Anuario de Estudios Centroamericanos* 40 (2014): 149–71.

²⁸ Ivan Briscoe and Sofía Martínez, “El Bumerán de La Seguridad En Centroamérica,” *Política Exterior* 31, no. 177 (2017): 133.

²⁹ Briscoe and Martínez. 135

³⁰ Levitt and Lamba-Nieves, “Rethinking Social Remittances and the Migration-Development Nexus from the Perspective of Time.”

impact at a national or regional level and are not merely constrained to the household which receives them.³¹

Kelly in *Inequality and Crime* provides an analysis on the impact caused by inequality on crime rates. His studies find that inequality does not increase property theft such as burglary but does lead to an increase to violent crime, such as homicides and theft.³² He notes that “property crime is well explained by the economic theory of crime, while violent crime is better explained by strain and social disorganization theories.”³³ Becker in *Crime and Punishment: An Economic Approach* is lauded as the creator of the economic theory of crime. In their paper, the author notes that the variables which affect the decision to commit a crime (and to expend resources on law enforcement institutions) is affected by the probability of being caught and punished, and the severity of the punishment.³⁴

³¹ Levitt and Lamba-Nieves. 20

³² Morgan Kelly, “Inequality and Crime,” *Review of Economics and Statistics* 82, no. 4 (November 2000): 538.

³³ Kelly. 530

³⁴ Gary S. Becker, “Crime and Punishment: An Economic Approach,” *Journal of Political Economy* 76, no. 2 (March 1968): 207.

Theoretical Framework

This paper's theoretical framework is based on different sources and theories which have previously analyzed the socioeconomic effect of remittances on each country, as there are no dominating theories on the particular relationship between remittances received and crime. The foundation for this paper's hypothesis is that remittances affect crime through two different multifaceted ways; the social and economic influences the migrant can have on the home country. The theoretical flowchart outlining the logic behind this paper's reasoning for the premise that remittances decrease crime rates can be found in Diagram 1.

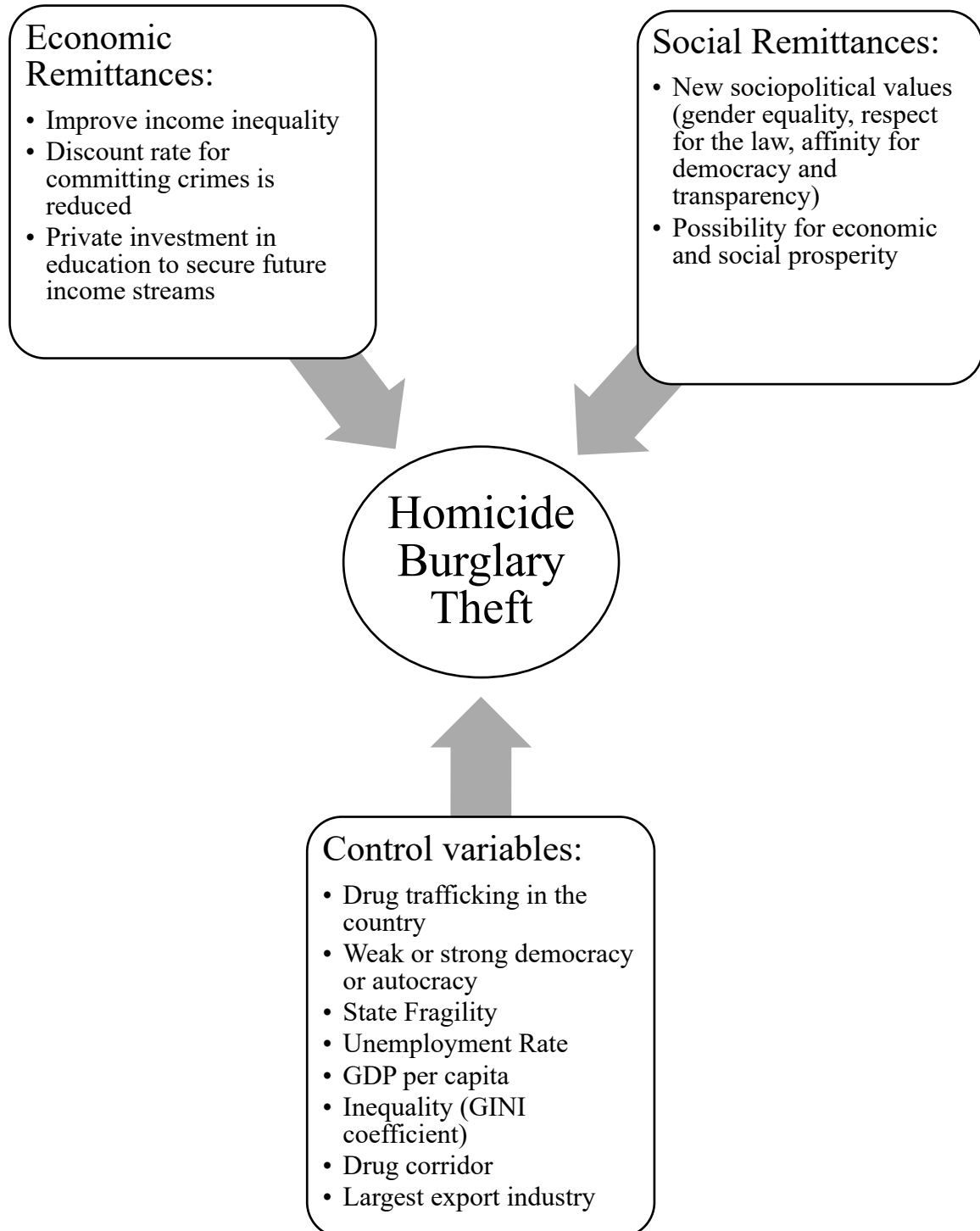
Socially, the migrant can send back values such as gender equality, respect for life, and an adherence to democratic principles which may not be observed in the home country due to lack of education, political instability, and/or economic crises.³⁵ The social aspects of remittances are hard to capture isolated from the economic remittances as these overlap in many different areas. An example of a recent development in social remittances, or values that have been transmitted from western countries to Latin America, is the movement called "Ni una más, ni una menos" which is a political movement that seeks to reduce the number of feminicides in Latin America. An example of the magnitude of this movement which has spread like wildfire through Latin America is the fact that one of the region's most important newspapers "El País" has dedicated an entire section to it.³⁶ These are the sort of social remittances that can shape the criminality in a country, as it puts pressure on the governments of Latin America to treat these problems seriously, as they might be in more socially developed countries.

Furthermore, the economic improvements in the migrants' life may also influence the receivers of remittances to focus on education and stray away from crime as a more prosperous life abroad is possible. Economically, remittances and remittance dependency also impact the country's crime rates through multiple mechanisms. The first mechanism is that inequality is improved since the receivers of remittances have access to larger revenue streams and as a result, they do not have to resort to violent crime as a means of subsistence.

³⁵ Levitt and Lamba-Nieves, "Rethinking Social Remittances and the Migration-Development Nexus from the Perspective of Time." 20

³⁶ El País, "Ni Una Menos," El País, March 7, 2022, <https://elpais.com/noticias/ni-una-menos/>.

Diagram 1: Variables' effect on crime



Furthermore, and most importantly, is the fact that remittances dependency creates a demand for education, as migrants will be able to access better job opportunities abroad with better education. This education has a two-pronged effect. First of all, the people who educate themselves and manage to leave the country have less incentives to resort to crime as the risk-reward ratio is altered. Whereas before these people might have committed crime as a way of achieving economic needs, the possibility of acquiring non-criminal (at least in the home country) revenue means that they have incentives to not commit crime as that could jeopardize their ability to migrate. Secondly, the people who educate themselves but do not manage to leave the country also have access to better job possibilities in the home country, even if their revenue streams might not be as high as they would be abroad.³⁷

Moreover, with regards to the largest export industries present in the country, people in the home country are no longer as susceptible to economic shocks such as a change in the agricultural cycle due to natural disasters or as susceptible to foreign demand for any of their exports.³⁸ This means that with remittances, they are able to maintain steady revenue streams which are, to a greater degree, insulated from economic shocks in the home country. These economic shocks might otherwise force people into crime as a way of living. An example of that vulnerability can be seen in 2020, when Panama's GDP shrunk by 17.95% due to the COVID pandemic whilst El Salvador, another country with a dominating service sector made up of mostly transport, only suffered a 7.94% decrease in GDP.³⁹ The difference is that Panama's service sector makes up 74.53% of their export basket, whilst El Salvador's is only 35.48%, according to 2019 data.⁴⁰

There are also other factors included into this model which can have an effect on the crime rates, such as whether the country is part of a drug corridor. Countries like El Salvador, Mexico, Colombia, and Panama, amongst others, are crucial parts of drug corridors into the United States and as such they may be susceptible to higher levels of crime. The level of democracy in a country can also directly relate to the level of crime experienced in it, as countries with strong democracies and strong autocracies tend to have lower levels of crime through different factors. However, countries with weak democracies are more susceptible to crime as the institutions in the country

³⁷ Collier, *Exodus*. 196

³⁸ Orozco, "Globalization and Migration." 21

³⁹ World Bank, "World Bank Open Data | Data," accessed January 24, 2022, <https://data.worldbank.org/>.

⁴⁰ The Growth Lab at Harvard University, "The Atlas of Economic Complexity," 2019, <https://atlas.cid.harvard.edu/>.

for fighting it are not adequate.⁴¹ Per this paper's data, there are no autocracies in Latin America and as such the index utilized will only measure the strength of democracies and not the strength of autocracies, as would have been the case in countries like the United Arab Emirates and Kuwait which exhibit extremely low rates of crime.

Furthermore, remittances may have a different impact amongst countries with different GDP per capita levels and inequalities, as remittances might be significantly more impactful on countries with high inequality and low GDP per capita levels and thus this is also a control variable in this thesis.

It must be noted that whilst remittances can act as a transnational safety net and provide goods which would otherwise be provided publicly, such as education and healthcare, security is difficult to provide through international money transfers. Hence, the premise for this paper is not that remittances are able to provide security to people but rather entice them away from crime as a way of subsistence, especially for countries which have a high remittance dependency. However, in countries with low remittance dependency, these may hold little influence as they are not as important to the social fabric.

Finally, as noted in studies, property crime (non-violent) is not necessarily reduced when inequality is reduced and so burglary may be susceptible to different outcomes, particularly if the institutions responsible for punishing burglars do not improve.⁴²

⁴¹ Ted Piccone, "Democracy and Violent Crime" (Brookings, September 2017). 1

⁴² Becker, "Crime and Punishment." 207

Methodology

This paper is based on an econometric analysis utilizing a plethora of variables collected from different sources. The analysis is based on how remittances affect three different types of crimes, burglary, as measured by instances of reported burglaries per 100,000 inhabitants; homicides, measured by total homicides per 100,000 inhabitants; theft, as measured per theft rates per 100,000 inhabitants. It is important to note the distinction between theft and burglary as it may not be discernible initially. Burglary is defined by the United States Congress as “the unlawful entry of a structure to commit a felony or theft”, whereas theft (or robbery as it is referred to in some sources) is defined as “the taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or threat of force or violence and/or by putting the victim in fear.”

⁴³The difference between burglary and theft is crucial to understanding the different outcomes as one involves violence and the other involves (to a greater amount) premeditation. For the purposes of this paper, homicides and theft will be classified as violent crime and burglary as non-violent crime.

The time span utilized for this analysis is from 2000-2018 as that is the period for which most data is available, especially considering the wide array of control variables utilized to account for endogeneity. However, the data on homicides, theft, and burglary is not equally available as the latter two only have approximately 156 data points whereas the former has 322. This is due to the difficulties in collecting data on non-lethal crime as opposed to homicides; non-lethal crime rates depend on the willingness of the victim to report and the capability of law enforcement institutions to collect, collate, and share these crime rates. Adversely, homicide rates are easier to collect due to the presence of a dead body that displays evidence of being murdered.

These three crime types were chosen as international monetary flows may have different effects on these. Since remittances might occur in times of economic instability, burglaries and theft rates might also change differently during these periods. As a result, during times of economic instability, burglaries, theft, and homicide might increase as people are more desperate in the home country. The statistics on theft and burglary were obtained from the UNODC database, whilst the statistics on homicide were obtained from the Institute for Health Metrics and Evaluation which

⁴³ US Department of Education, “Violence Against Women Act,” October 20, 2014, 62752–90.

compiles country data based on cause of death and provides a more complete dataset than the UNODC's homicide statistics.^{44,45}

The models utilize data from 17 countries in Latin America, as follows: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, El Salvador, and Uruguay. These countries, in addition to Cuba and Venezuela, were chosen because they have similar cultures and are all geographically continuously interconnected from Mexico to Chile, meaning one can trace a direct line from Mexico and Chile without excluding any major geographical area. As for Cuba and Venezuela, these would have been interesting cases to analyze due to their strenuous conflict with the United States (an important source of remittances) but, unfortunately, the data for these was not available to the extent that it was for other countries. Additionally, countries which are part of Latin America but do not share similar cultures and speak different languages were not included in the analysis, such as most countries in the Caribbean or the French colonies on the eastern coast of South America.

In total, 8 kinds of regressions were run for each type of crime (24 total); half were run to measure the effect of total remittances (log) and half to measure the effect of remittance dependency of the economy, measured by share of total GDP which comes from remittances. The first 6 regressions were run utilizing the pooled OLS method, however in order to control for endogeneity issues, 6 more regressions were run using time fixed effects, 6 with country fixed effects, and 6 using the between model. The fixed effects and between models are useful as these do not suffer from the same endogeneity issues as the pooled OLS regressions, which can have issues with endogeneity in a panel analysis involving this kind of data.⁴⁶ The between model computes time averages of the data and can help analyze long-run relationships between variables.⁴⁷

The model specification for the OLS regressions is as follows, where α is the intercept, β is the coefficient of the remittance variable (either as the share of GDP or log total remittances), $Z_t\Delta_t$ is the vector of control variables (list and descriptions below) and the error term.

⁴⁴ UNODC, "Homicide Country Data | DataUNODC."

⁴⁵ IHME, "Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2019" (Institute for Health Metrics and Evaluation, 2021), <https://ghdx.healthdata.org/gbd-results-tool>.

⁴⁶ Jeffrey M. Wooldridge, *Introduction to Econometrics*, Europe, Middle East and Africa ed (Andover: Cengage Learning, 2014). 372

⁴⁷ Croissant and Millo. 3

$$Y_t = \alpha + \beta_t X_t + Z_t \Delta_t + \varepsilon_t$$

The final list of control variables is as follows:

- GDP per capita (log)
- Unemployment rate (%)
- Polity IV Democracy Index
- GINI Coefficient
- State Fragility Index
- Drug corridor (dummy)
- Poor country (dummy)
- % GDP captured by largest export industry
- Largest export industry (categories below):
 - Agricultural (base)
 - Electronics
 - Machinery
 - Metals
 - Services
 - Textiles
 - Vehicles

The data on remittances was obtained from the World Bank database and is utilized in two different ways. First, the total amount of remittances in current US dollars to see whether there is a trend between the absolute quantity of money inflows and crime. The total amount of remittances is in a log variable in order to account for % increases in these so it is easier to interpret and to allow for an easy comparison between the amount of money sent to the home country.

The model will also utilize remittances as a percentage of GDP, as 30 billion dollars in remittances for Mexico would be greater than the total GDP of El Salvador and thus the effects may be different when the model utilizes remittances within the context of total GDP.⁴⁸ The share of GDP which is due to remittances will allow for an analysis of remittance dependency (hereafter remittance dependency will always refer to models that utilize this variable), to see how much a country's economic dependency on remittances affects the crime in the same. Countries with higher dependency may be more susceptible to changes in the economic and social effects of remittances as a greater remittance dependency means that remittances hold greater influence on the institutions present in a country. The remittance dependency variable is arguably more relevant to the research as it encapsulates the main hypothesis which is that a dependency on remittances leads to less crime.

⁴⁸ World Bank, "World Bank Open Data | Data."

There are multiple control variables which are utilized to measure whether different social conditions in the country mean that remittances have a different effect on crime. These are important to this analysis as they help control for endogeneity between crime and remittances, as there are some factors which may also affect both and including them in the analysis is a way of isolating the effect that remittances have on the different types of crime. The variables have been chosen in a way that avoids perfect multicollinearity.

Unemployment is used as a control variable as it is one of the factors which can affect the need for emigration to the developed world to provide families with the necessary transnational safety net through remittances. Unemployment can have a significant impact on crime, particularly that which is done as a revenue source and so it is an important variable since it can influence burglary and theft rates.⁴⁹ A country with low unemployment would arguably have a lower dependency of remittances and as such the impact on crime would be lower than it would be in a country with high unemployment, wherein many citizens may resort to crime in order to fulfill their basic needs. Data on unemployment is also retrieved from the World Bank database and is measured in percentage.⁵⁰

GDP per capita (current USD) is also controlled for to see whether remittances' impact on crime increases or decreases as the population's wealth increases. This is to analyze whether there are different effects which remittances have on countries wherein the population is richer than in others, as there are significantly different levels of wealth in Latin America with countries like Panama having GDP per capita as high as \$15,000 and countries like Nicaragua having GDP per capita as low as \$2,000 in 2018 and \$1,000 in 2002. The data on GDP per capita was also retrieved from the World Bank database and is measure in current US dollars which is useful to compare relative wealth across time periods.⁵¹

The time fixed effects analysis does not utilize a GDP per capita variable but instead a dummy variable named *poor* which measures whether country is in the lowest 25th percentage in terms of GDP per capita, which allows us to isolate the effect that poverty has on the crime rates of a country. This threshold was chosen for symmetrical reasons and is based on Sen's book which states that poverty markers set by international organizations (such as the UN's poverty threshold)

⁴⁹ Steven Raphael and Rudolf Winter-Ebmer, "Identifying the Effect of Unemployment on Crime," *The Journal of Law and Economics* 44, no. 1 (April 2001): 259

⁵⁰ World Bank, "World Bank Open Data | Data."

⁵¹ World Bank.

may not be useful to judge wealth, as people's economic wellbeing is better when compared to the other people they live with or nearby.⁵²

The GINI coefficient is also included in the analysis as inequality might have an impact on violent crime and as such it is important to determine whether more unequal countries' crime rates are altered when they obtain remittances. This metric is not without its deficits, as it is difficult to interpret what an increase or decrease in one unit (0.01) of GINI coefficient means, as it is composed of many factors. The data on the GINI coefficient was also collected from the World Bank database and can be interpreted as follows: a country exhibiting perfect equality has a GINI coefficient of 0, whilst a country with a coefficient of 100 has perfect inequality. This is of the utmost importance in Latin America as the countries range from 38 to 61 in their GINI scores, hence some are significantly more unequal than others.^{53,54}

Another control variable will be democracy, as measured per the Centre for Systemic Peace's Polity IV index which compiles historical data for most countries in the world and includes full data for all countries in Latin America.⁵⁵ This data is utilized to determine whether a country is a democracy, autocracy, or anocracy (a mixture of both). This is important for this analysis as the political composition of a country can have a huge effect on crime, as strong democracies have, on average, stronger institutions which can properly incentivize citizens to stray from crime such as unemployment benefits and strong law enforcement agencies that ensure crime does not go unpunished.⁵⁶ This is equally true of strong autocracies, however there are no autocracies included in this paper's selected data. The maximum score for a democracy is 10 and goes down to -10 which would signify a strong autocracy. The data compiled however has a minimum of 4, meaning there are no autocracies but there are a variety of weak democracies.

Another one of the control variables chosen to account for crime rates was the State Fragility Index, also developed by the Center for Systemic Peace, which measures country's "effectiveness and legitimacy in four performance dimensions: security, political, economic, and social".⁵⁷ This variable was chosen as it can account for the effectiveness of the state to operate

⁵² Sen, *Development as Freedom*. 21

⁵³ World Bank, "World Bank Open Data | Data."

⁵⁴ Jeffrey Sachs, *The Age of Sustainable Development* (New York: Columbia University Press, 2015). 56

⁵⁵ Monty G. Marshall, "Polity 5: Political Regime Characteristics and Transitions, 1800-2018. Dataset Users' Manual," User Manual (Center for Systemic Peace, 2020). 10

⁵⁶ Piccone, "Democracy and Violent Crime."

⁵⁷ Monty G. Marshall and Gabrielle Elzinga-Marshall, "State Fragility Index and Matrix," User Manual (Center for Systemic Peace, 2018). 7

against crime which could also affect the choices that people make, as they may be more willing to commit crime if the state's security apparatus is not effective or if the economic situation is fragile and necessities are not secured in the medium- and long-term. This variable is of importance as it measures whether the state has effective institutions for controlling crime. The maximum score is 25 and the minimum is 1 and is made up of two parts, a state's effectiveness score and their legitimacy score, with their respective total scores' ranging from 0 to 13 and 12. The effectiveness and legitimacy scores are comprised of economic, social, political, and security effectiveness and legitimacy respectively. As for the interpretation, a state with a score 0 has "no fragility" going up to a 3 which is "high fragility", with the exception that economic effectiveness goes up to 4 meaning "extreme fragility".⁵⁸ This implies that a state with a score of 25 has extreme fragility and a state with 0 has no fragility.

There is also another variable included which is the *corridor* dummy, that determines whether a country is part of a major drug route to the United States.⁵⁹ These countries may be susceptible to larger amounts of crime due to the nature of the drug trafficking industry and as such, the results may be skewed if this dummy is not included. Drug trade volume through the country would be a more adequate control variable, however there is no such data available to the public and as such, this is the next best alternative. Trade routes to Europe and Asia were not included in this analysis as the trade routes for these countries are mostly through the ocean and as such might not traverse much Latin American territory.

Another control variable used is one which determines the largest export industry in the country, i.e., agriculture, manufacturing, services, metals such as gold, and minerals such as oil and gas. It must be noted that the entire manufacturing sector is accounted for but rather their largest subsectors. The subsectors which are present in this analysis are agriculture (base sector, i.e., 0 in the regression analysis), machinery, metals, minerals, electronics, services, textiles, and vehicles. These classifications are based on the HS 1992 code which classifies the different products exported and was obtained from the Growth Lab at Harvard University's Atlas of Economic Complexity, which measures and categorizes each country's export basket and trade partners.⁶⁰

⁵⁸ Marshall and Elzinga-Marshall. 7

⁵⁹ Cécile Marin, "Major Drug Routes in Latin America," *Le Monde Diplomatique*, January 1998, <https://mondediplo.com/maps/drugs>.

⁶⁰ The Growth Lab at Harvard University, "The Atlas of Economic Complexity."

The industry variables discerns whether there are differences in countries with different dominating industries, as there may be different economic realities for countries where the leading industry is the textile industry versus ones where the leading industry is the electronics industry as these can lead to vastly different economic conditions. As mentioned by Orozco, remittance increases are linked to agricultural shocks and as such, a country which has a dominating agricultural sector may be more susceptible to having a large quantity of remittances and depend on the steady revenue streams more than other countries.⁶¹ It must be noted that in the models, agricultural societies are the base category and as such all regression results only include the differences between other export industries vis-à-vis agricultural societies, i.e., a coefficient of 0.10 for service sectors in the (log) theft regression implies that, holding all other variables constant, countries with a dominating service sector have 10% more theft than agricultural societies, on average.

Finally, there is also a variable to measure the percentage of the largest industry which contributes to the country's export basket and total GDP to see the differences between countries with similar industrial compositions. This data was also obtained from the Atlas of Economic Complexity.

The control variables were chosen to alleviate endogeneity within the model as they help dissect the different issues that may cause crime and help isolate the effect that remittances have.

Despite the similarities in cultures and common colonial heritage shared by these countries, they have, since independence, traversed different paths and now there are significant differences in their economies as countries like Brazil and Argentina are much wealthier than Central American countries like Honduras and Nicaragua, meaning that the effect that remittances have on crime may be completely different.

⁶¹ Orozco, "Globalization and Migration." 21

Table 1: Summary of all data collected

Statistic	N	Mean	St. Dev.	Min	Max
Total Remittances (Thousands, current USD)	318	3,074,720.000	5,486,703.000	6.038	35,768,417.000
Remittances as % share of GDP	318	4.806	5.766	0.00003	21.803
GDP per capita (Current USD)	322	5,766.242	4,085.287	904.226	18,703.860
Homicides per 100,000	322	21.431	20.272	3.399	106.821
Theft count per 100,000	158	342.448	259.741	19.440	1,125.940
Burglary count per 100,000	156	535.508	770.147	17.260	3,179.510
Unemployment Rate (%)	322	6.167	3.163	2.020	20.520
Polity IV Democracy Index	322	8.134	1.227	4	10
State Fragility Index	322	6.761	3.699	1	16
Drug Corridor (Dummy)	322	0.590	0.493	0	1
Largest Export Industry (% of total exports)	322	40.133	11.375	4.170	73.950
GINI Coefficient	256	49.454	4.722	38.000	61.600

Results and Analysis

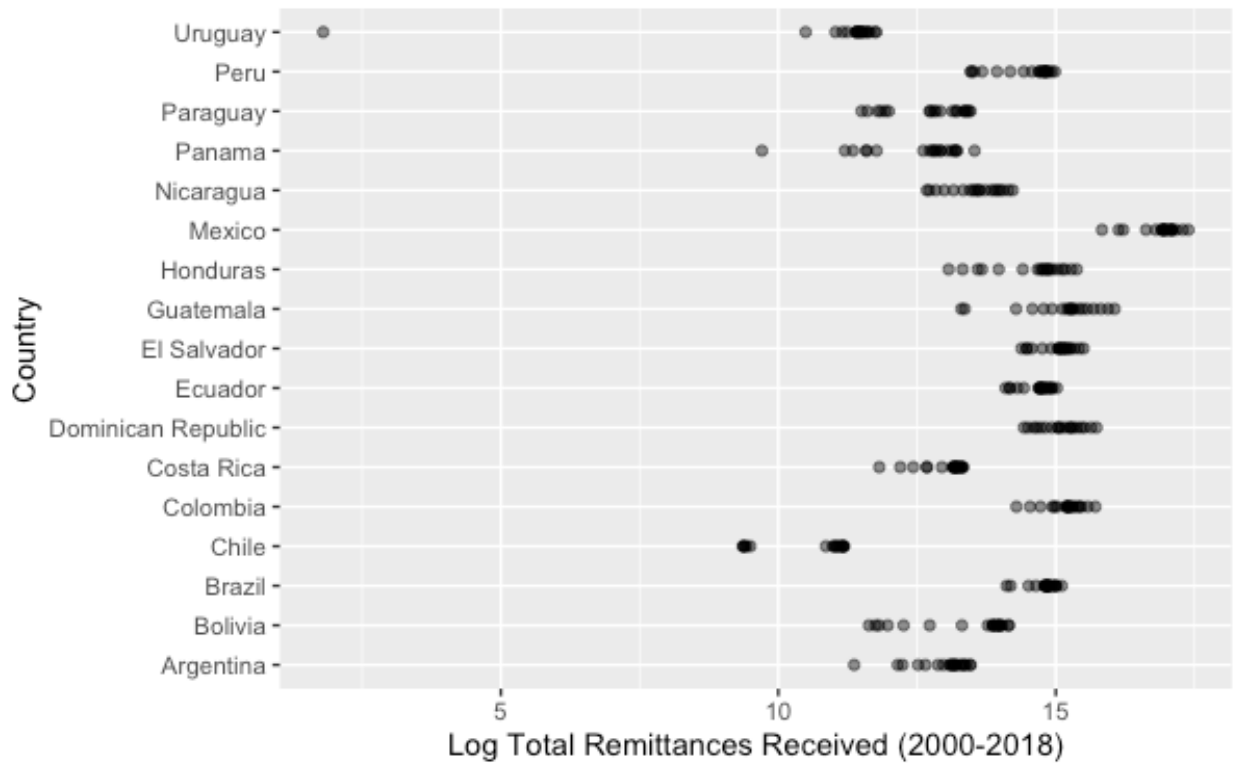
Descriptive Results

Table 1 shows the summary of all the data obtained. The differences in remittances received by Latin American countries are significant, with some countries only receiving approximately \$6,000,000 in remittances as per the World Bank, whereas others like Mexico obtained 35 billion in remittance transfers in 2018.⁶² This discrepancy is noteworthy as the total amount of remittances sent to Mexico is equal or greater to the GDP of a small nation such as El Salvador, whose GDP is significantly less than \$35 billion. Another important statistic is that the share of remittances in Latin America is approximately 4.8%, meaning that almost 5% of the entire region's wealth comes from abroad. The enormous remittance dependency is a reason why these money flows are able to affect so many of the socioeconomic and political realities of the home country's citizens. This is particularly true for countries such as El Salvador whose remittance dependency is oscillates around the 20% of GDP mark.

Furthermore, there are also significant differences in the crime rates experienced in these countries, but the mean for Latin America is still relatively high with the region suffering from 21

⁶² World Bank, "World Bank Open Data | Data."

Figure 1: Remittances Received

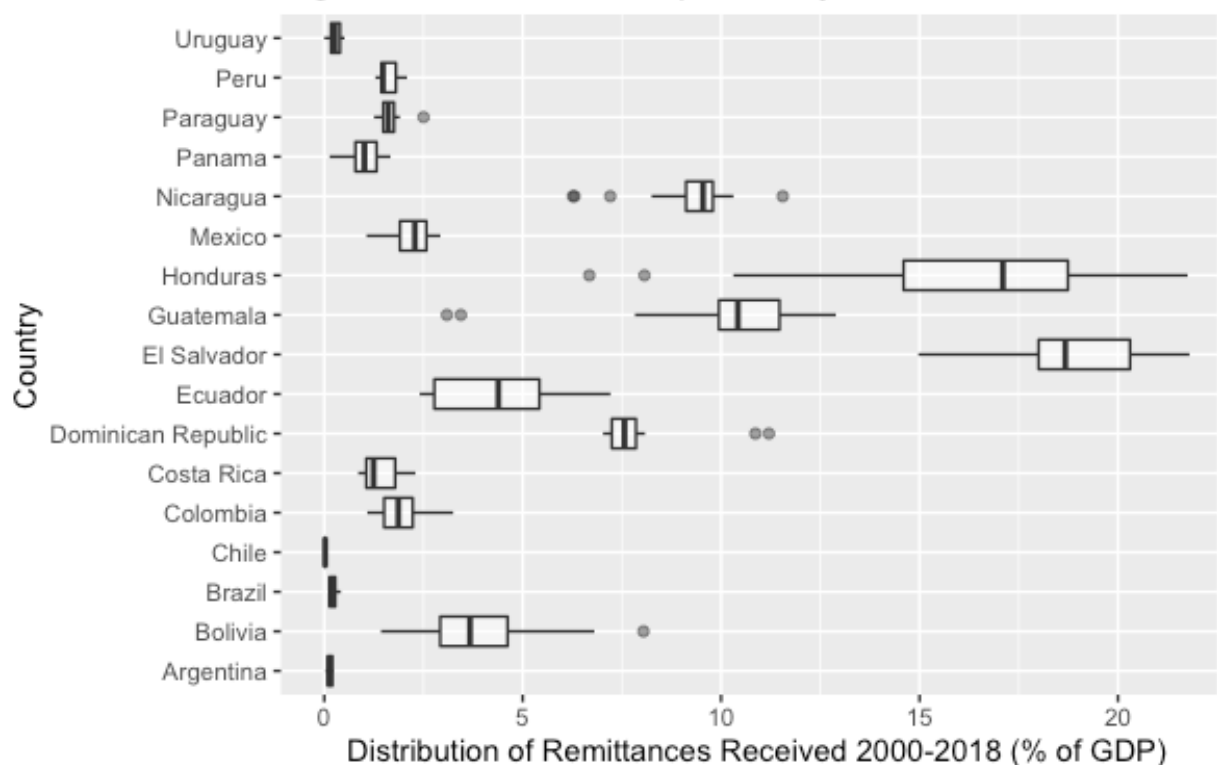


daily homicides between 2000 and 2018 and an average of 342 thefts daily and 535 burglaries. The significance of this research is encapsulated when looking at the maximum values, as there are countries which have suffered annual homicide rates of over 100 per 100,000, i.e., 0.1% of the population died due to homicide. Hence, any research which examines a causal mechanism that could potentially reduce crime could be significant to the understanding and alleviating of these.

Table 1 also displays important information regarding the socioeconomic and political situation in Latin America, as it reflects the inequality of the region as 49 per the GINI coefficient. It also mentions that the region as a whole has a State Fragility Index of 6.7, which is not as high as other regions such as Sub-Saharan Africa, but it is far from being as strong as Western Europe.⁶³ It also notes that 59% of Latin American countries are part of a drug corridor, i.e., 10/17 of the countries in this study. Furthermore, the unemployment rate is 6% which is not extremely high, but it has occasionally been as high as 20% (Colombia in 2000) which means that at times it has had profound impacts on the economic wellbeing of countries. Finally, Table 1 shows that Latin American countries' largest industries are on average 40% of the country's export basket which means that there is diversification in the economy but a shock to the industry could also be

⁶³ Marshall and Elzinga-Marshall, "State Fragility Index and Matrix."

Figure 2: Remittance Dependency



disastrous to the economy, especially for those with export industries that account for as high as 73.95% of the total export basket, i.e., Panama’s service sector, which is mostly transportation, i.e., the Panama Canal.⁶⁴

Figure 1 displays the log distribution of remittances received by the different countries in Latin America. The figure displays some important information as there are some countries which receive significantly more remittances than others, with countries like Mexico, Guatemala, and the Dominican Republic receiving significantly more than countries like Panama or Chile. However, it must be noted that countries like Panama and Chile boast significantly higher GDPs than Guatemala and the DR as well, despite receiving less remittances.

Figure 2 displays the distribution of all remittances received by Latin American countries from 2000 to 2018 as a share of their total GDP. The figure shows that certain countries have experienced significantly different amounts of remittance dependency from 2000 to 2018. There are also countries like Uruguay, Peru, and even Mexico to a certain extent who have remained at similar levels of remittance dependency, meaning that their remittances have increased almost at

⁶⁴ The Growth Lab at Harvard University, “The Atlas of Economic Complexity.”

Figure 3: Impact of remittance dependency on crime

Figure 3.1: Homicides

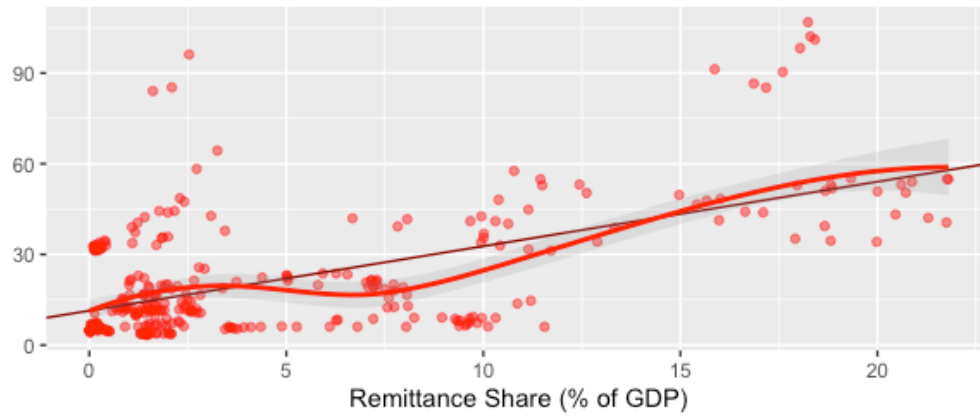


Figure 3.2: Theft

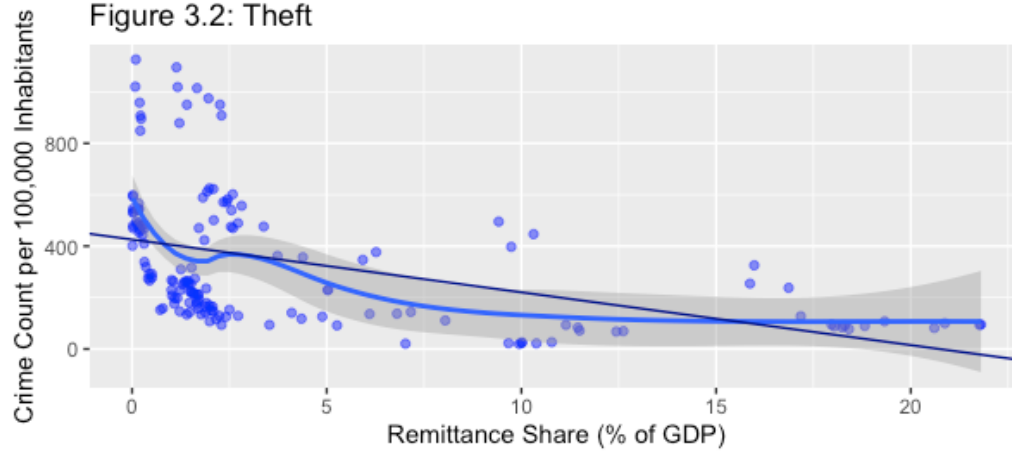
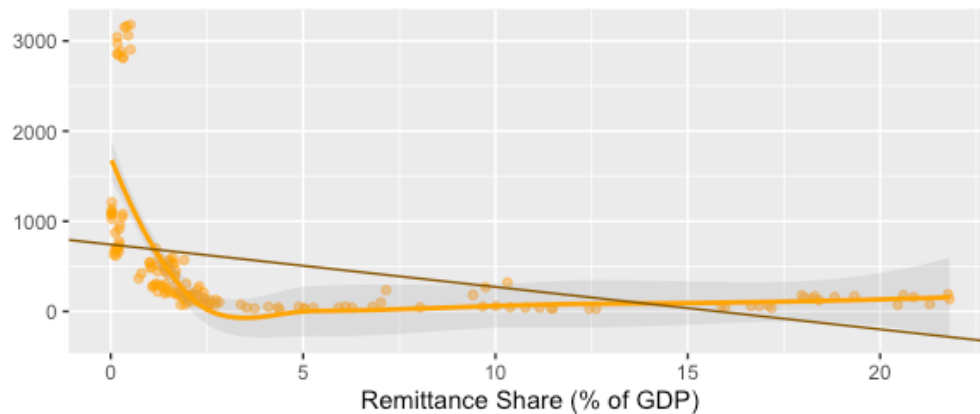


Figure 3.3: Burglary



the same rate as their GDP and have maintained the same ratio. It is important to note that Figure 2 does not display the time trend for remittances from left to right, as the data shows that Ecuador

Table 2: Pooled OLS - Effect of % increases of Remittance Share (% of GDP) on % Crime

	Homicide	Theft	Burglary
Remittances as % share of GDP	0.106*** (0.012)	-0.093*** (0.024)	-0.065*** (0.023)
Log GDP per capita (Current USD)	0.878*** (0.080)	-0.008 (0.136)	0.610*** (0.129)
Polity IV Democracy Index	-0.151*** (0.035)	-0.223*** (0.055)	0.400*** (0.051)
State Fragility Index	0.089*** (0.019)	-0.153*** (0.029)	-0.0003 (0.027)
Metals	-0.705** (0.278)	0.029 (0.295)	-0.796*** (0.273)
Minerals	-0.264*** (0.099)	-0.092 (0.161)	-0.627*** (0.155)
Textiles	0.390** (0.190)	0.389 (0.347)	0.741** (0.325)
Unemployment Rate (%)	0.064*** (0.011)	-0.040* (0.021)	0.114*** (0.018)
GINI Coefficient	0.086*** (0.010)	0.026 (0.017)	-0.013 (0.014)
Adjusted R ²	0.740	0.680	0.882
Breusch Pagan test results (p-value)	0.000	0.024	0.001

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

has grown less remittance dependent, going from 7.21% in 2000 to 2.82% in 2018; whilst Honduras has gone from 6.67% to 19.98% in the respective period.

Figure 3 is a consolidation of the effect of remittances and the three different crimes in Latin America. The figure is composed of a basic regression of remittances onto crime, without control variables, from which the coefficient and intercept of the straight line is made up of. Secondly, the figures also include a local/moving regression which helps visualize the data's points in an easier manner but must not be interpreted statistically. The figure was created as a way to visualize the simple correlation between remittance dependency and crime statistics, but since it does not include control variables it cannot be taken as statistically accurate.

Figure 3.1 shows an image that is counterintuitive to the hypothesis stated in this paper, as it shows that remittance dependency actually increases homicide rates. This may be due to the fact

Table 3: Pooled OLS - Effect of % increases of Total Remittances on % Crime

	Homicide	Theft	Burglary
Log total remittances	0.219*** (0.035)	-0.263*** (0.062)	-0.136** (0.058)
Log GDP per capita (Current USD)	0.410*** (0.077)	0.491*** (0.122)	0.928*** (0.117)
Polity IV Democracy Index	-0.103* (0.042)	-0.307*** (0.064)	0.373*** (0.061)
State Fragility Index	0.089*** (0.020)	-0.128*** (0.029)	0.016 (0.027)
Electronics	-0.185 (0.166)	0.544** (0.191)	-1.202*** (0.185)
Unemployment Rate (%)	0.063*** (0.011)	-0.049** (0.021)	0.113*** (0.019)
Drug Corridor (Dummy)	0.090 (0.114)	-0.130 (0.161)	-0.225 (0.156)
GINI Coefficient	0.056*** (0.009)	0.050*** (0.016)	0.0002 (0.014)
Adjusted R ²	0.707	0.689	0.880
Breusch Pagan test results (p-value)	0.001	0.001	0.000

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

that homicides may not be economically motivated necessarily. Hence, an increase in remittance dependency might reduce inequality and foster education but these may not sufficiently affect the motivators for homicide. This may be the case for countries wherein there have been many race- or class- based conflicts, or there is a strong presence of gang violence. Future research could classify homicides by motivation to see if most of the homicides stem from a certain group of people who are not affected by remittances. These could be groups such as gang members or historically disenfranchised people who have no access to the basic education needed to migrate and send remittances to the home country. However, the reason for the positive correlation may also be due to the issue of endogeneity wherein homicides cause people to migrate which increases remittances. This issue is addressed in the regression results.

Figures 3.2 and 3.3 better reflect the hypothesis in this paper, which implies that an increase in remittance dependency decreases crime rates. It must be noted that for Figure 3.3 there is a

Table 4: Time Fixed Effects - Effect of % increases of Remittance Share (% of GDP) on % Crime

	Homicide	Theft	Burglary
Remittances as % share of GDP	0.093*** (0.009)	-0.078*** (0.011)	-0.003 (0.016)
Polity IV Democracy Index	-0.193*** (0.040)	-0.252*** (0.055)	0.481*** (0.080)
State Fragility Index	-0.026 (0.016)	-0.170*** (0.021)	-0.068** (0.030)
Largest Export Industry (% of total exports)	-0.003 (0.003)	-0.009** (0.004)	0.008 (0.007)
Drug Corridor (Dummy)	0.132 (0.088)	-0.306** (0.124)	-0.759*** (0.178)
Poor Country (Dummy)	-0.554*** (0.123)	0.387** (0.175)	-0.813*** (0.251)
GINI Coefficient	0.116*** (0.011)	-0.001 (0.016)	0.027 (0.022)
Adjusted R ²	0.617	0.597	0.621

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

cluster of data points which suffered extremely high rates of burglary. The country which is displayed in those data points is the highest GDP country in Latin America, Uruguay. The explanation might be that wealth causes criminals to shift from theft to burglary as people are more likely to have their money at home rather than with them.

Regression Results

The tables presented in this section are the multiple variable regression analysis using the four different types of estimators, in order, the pooled OLS method, time fixed-effects, country fixed-effects, and the between model. Note: all crime rates have been converted to log in order to provide an easier interpretation.

The results obtained from the first six pooled OLS regressions can be found in Tables 2 and 3. There are some important considerations to be learned from these simple OLS regressions, such as the fact that homicides tend to increase by 10% for every percentage increase in remittance

Table 5: Time Fixed Effect Regressions - Effect of % increases of Remittance on % Crime

	Homicide	Theft	Burglary
Log total remittances	0.121** (0.052)	0.017 (0.071)	-0.232*** (0.081)
Polity IV Democracy Index	-0.322*** (0.055)	-0.057 (0.075)	0.334*** (0.085)
State Fragility Index	-0.068*** (0.019)	-0.157*** (0.026)	-0.049 (0.030)
Largest Export Industry (% of total exports)	0.001 (0.005)	-0.008 (0.006)	-0.003 (0.007)
Drug Corridor (Dummy)	0.479*** (0.109)	-0.734*** (0.147)	-0.562*** (0.166)
Poor Country (Dummy)	0.216 (0.132)	-0.175 (0.188)	-0.982*** (0.203)
GINI Coefficient	0.084*** (0.013)	0.050*** (0.017)	0.031 (0.019)
Adjusted R ²	0.434	0.416	0.648

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

dependency, with thefts and burglaries decreasing by 9.3% and 6.5% respectively as well, as seen in Table 2.

Table 3 provides another set of results which match the ones in Table 2 and Figure 3, as it the regressions show that, on average, and keeping all other variables constant, homicides increase by 0.21% for every percentage increase in remittances, whereas theft and burglary go down by 0.09% and 0.06% respectively.

Regarding the State Fragility Index, both tables 2 and 3 show that it increases the homicide rate but decreases the theft rate. With regards to the GDP per capita, all countries show that for every % increase in GDP per capita, all types of crime increase. This could be related to the fact that whilst GDP increases, it does not mean that everyone benefits from it equally (or at all). Hence, it is also important to look at the GINI coefficient, for which the results show that an increase in 1 GINI unity (however that may be interpreted) leads to an increase in homicides and theft.

Tables 2 and 3 in general show similar results to Figure 3 and have other important statistics regarding the impact of state fragility, unemployment, GDP, and democracy on crime rates.

Table 6: Country Fixed Effects - Effect of % increases of Remittance Share (% of GDP) on % Crime

	Homicide	Theft	Burglary
Remittances as % share of GDP	0.011 (0.010)	0.037 (0.037)	-0.031 (0.031)
Log GDP per capita (Current USD)	0.109* (0.061)	0.546*** (0.149)	0.397** (0.155)
Polity IV Democracy Index	0.039 (0.030)	-0.021 (0.085)	-0.113 (0.086)
State Fragility Index	0.023* (0.013)	0.022 (0.029)	-0.041 (0.029)
Largest Export Industry (% of total exports)	-0.005** (0.002)	-0.001 (0.005)	0.002 (0.005)
Unemployment Rate	0.039*** (0.009)	-0.013 (0.026)	0.016 (0.024)
Adjusted R ²	0.025	0.125	0.061

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

However, the results shown in Tables 2 and 3 present a large amount of heteroskedasticity, reflected in the Breusch Pagan tests at the bottom of each table. This means that it is crucial to utilize other regression models such as fixed effects and the between model; by utilizing these other models, endogeneity issues are alleviated in addition to resolving issues of having unobserved effects that are correlated with the regressors.⁶⁵

The time fixed effects models shown in Tables 4 and 5 only include time invariant variables and as such do not include GDP per capita or unemployment. The GDP per capita variable was replaced with the poor country dummy to capture the differences between poor and non-poor countries, i.e, the bottom 25% and the top 75%. These results also display some significant results, but since they do not include differences for countries these have to interpreted for the region as a whole.

Table 4 shows the most promising results of the entire paper, as it shows that for every percentage increase in remittance share, homicides increase by 0.09% and theft decreases by 0.07%. The regression for burglary is insignificant which means that, regionally, remittances do

⁶⁵ Yves Croissant and Giovanni Millo, "Panel Data Econometrics in R: The **Plm** Package," *Journal of Statistical Software* 27, no. 2 (2008). 34

Table 7: Country Fixed Effect Regressions - Effect of % increases of Remittances on the % of Crime Rates

	Homicide	Theft	Burglary
Log total remittances	0.082** (0.039)	0.067 (0.133)	-0.108 (0.131)
Log GDP per capita (Current USD)	0.057 (0.065)	0.499*** (0.163)	0.471*** (0.168)
Unemployment Rate	0.039*** (0.009)	-0.013 (0.026)	0.020 (0.024)
GINI Coefficient	-0.001 (0.008)	-0.004 (0.018)	0.025 (0.018)
Adjusted R ²	0.037	0.118	0.058

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

not impact the burglary rate displayed. The results also display that the strength of a democracy significantly affects all crime rates. In stronger democracies, violent crime like homicide and theft are lower whilst burglaries (property crime) are higher. The state fragility index also shows that as states become more fragile, theft and burglary decrease; this is counterintuitive but could mean that the states' apparatus to collect crime statistics is diminished as fragility increases.

Furthermore, table 4 also shows that poor countries have higher theft rates but lower homicide and burglary rates, whilst countries that are part of drug corridors have lower theft and burglary rates. Another key takeaway from table 4 is that more unequal countries have higher homicide rates on average, keeping all other factors constant.

Table 5 also has significant results for homicide and burglary, as it shows that for every percentage increase in total remittances received, the homicide rate goes up by 0.121% and the burglary rate decreases by 0.232%. These results also corroborate the results in Table 4 as the GINI coefficient has a significant positive correlation with the theft and homicide rates, which go up as countries become more unequal. For both tables 4 and 5, the largest export industry coefficients are mostly insignificant, except for Table 4 which shows that, as a country's largest export industry grows, their theft rate decreases.

Tables 6 and 7 concern country fixed effects and 5 of the 6 regression coefficients are insignificant. These models were only created using time variant effects and so the drug corridor variable and the industry categorical variable were not included. The effects seen in the country

Table 8: Between Model Regressions - Effect of % increases of Remittance Share (% of GDP) on % Crime

	Homicide	Theft	Burglary
Remittances as % share of GDP	0.193*** (0.029)	-0.166*** (0.050)	-0.026 (0.056)
Log GDP per capita (Current USD)	1.440*** (0.329)	-1.246** (0.524)	0.087 (0.608)
State Fragility Index	0.152** (0.060)	-0.272** (0.111)	-0.044 (0.123)
Largest Export Industry (% of total exports)	0.007 (0.010)	-0.019 (0.018)	0.024 (0.021)
Drug Corridor (Dummy)	0.074* (0.038)	0.044 (0.089)	0.217* (0.108)
Poor Country (Dummy)	0.148*** (0.031)	0.001 (0.065)	-0.029 (0.073)
GINI Coefficient	-19.479*** (4.251)	22.038** (6.900)	0.678 (7.564)
Adjusted R ²	0.843	0.458	0.601

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

fixed effect model can be interpreted as the differences between each country, however the only significant variable with regards to remittances is that, for every percentage increase in total remittances received, the homicide rate goes up by 0.08%.

What this means is that there is no discernible difference for all other 5 remittance regressors when controlling for country differences. However, some of the control variables show significant results. For instance, in Table 6 (remittance dependency), GDP per capita increases the crime rate in all countries, meaning that as countries get 1% richer their homicide, theft, and burglary rates go up by 0.1%, 0.54%, and 0.39% respectively. Another key takeaway from both tables is that percentage increase in the unemployment rate is related to a 0.03% increase in homicide rates.

Tables 8 and 9 are the final regressions done in this study and are the ones which utilized the between model estimator. These regressions also hold significant results for some of the remittance regressors, as 3 of the 6 coefficients are statistically significant.

Table 9: Between Model Regressions - Effect of % increases of Remittance on % Crime

	Homicide	Theft	Burglary
Log total remittances	0.251 (0.219)	-0.444* (0.232)	-0.283 (0.205)
Log GDP per capita (Current USD)	-0.304 (0.490)	0.159 (0.510)	0.443 (0.441)
Polity IV Democracy Index	-0.179 (0.297)	-0.435 (0.320)	0.248 (0.276)
State Fragility Index	-0.074 (0.115)	-0.127 (0.133)	-0.005 (0.110)
Largest Export Industry (% of total exports)	0.006 (0.026)	-0.028 (0.026)	0.008 (0.023)
Unemployment Rate	0.053 (0.087)	0.040 (0.114)	0.197* (0.100)
GINI Coefficient	0.100 (0.070)	0.070 (0.078)	-0.020 (0.066)
Adjusted R ²	0.189	0.151	0.663

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 8 shows that as remittance dependency increases, so does the homicide rate; the theft rate however is decreased whilst the results for burglary rates are not statistically significant. Another key takeaway is that for every percentage of increase in GDP per capita, homicide rates also increase by 1.44% whilst theft rates go down by 1.24%.

A key statistic highlighted in table 8 is that as inequality increases, homicide rates decrease whilst theft rates increase. This is counterintuitive and goes against the results shown in table 4, which stated that inequality increased the homicide rate across the region. Poor countries are also shown to have 14% higher homicide rates than those which are in the top 75% of wealth.

Table 9 displays the relationship between total remittances received and the crime rate. The only significant remittance regressor in this model is theft, as it shows that for every percentage increase in remittances received, the theft rate goes down by 0.44%. Besides this result, the only other significant result in this model is the effect of unemployment on burglary. On average,

keeping all other variables constant, a percentage increase in the unemployment rate causes the burglary rate to go up by 0.19%.

Interpretation

The results seen in the regressions have some important takeaways, even if they were not all statistically significant, particularly the country fixed effects which yielded largely insignificant results and the pooled OLS regressions which suffered from heteroskedasticity. However, the time fixed effects model which was a regional model did have significant effects and the between model also yielded significant takeaways in respect to the effect that remittances have on crime.

As both the time fixed effects and the between model for remittance dependency showed that an increase in remittances as part of a GDP led to a decrease in theft, there is strong evidence that remittance dependency leads to a decrease of theft. These results are noteworthy because they go against endogeneity concerns that an increase in crime could lead to migration and so increase remittances. However, due to the negative relationship between the variables, it can be said that remittance dependency decreases theft and as such any mechanisms employed by Latin American governments to facilitate remittances could be vital to the wellbeing of peoples in these countries. Such measures might include negotiating deals with developed nations to allow for legal migration to these countries to access revenue streams that could lower theft in the home country. Furthermore, banking regulations might also be changed to allow people to access these revenue streams with more ease, as many of the mechanisms for remittance transfers charge a fee to the sender or receiver which diminishes the impact of these money flows.

An example of this is that El Salvador recently legalized Bitcoin and one of the key motivations was that it allowed for an easy way for migrants to send money in real time to their home country without having mandatory fees. However, that mechanism is not perfect as the energy consumption generated by Bitcoin is enormous and the lack of regulation also enables black market transactions to take place more easily. The critics have noted that the country is not yet ready for such mechanisms however, due to the fact that it is costly for them to utilize mobile applications and there is a distrust in technology like Bitcoin, mostly due to a lack of understanding.⁶⁶

⁶⁶ Eric Flood, "El Salvador and the Potential for Low-Fee Crypto-Remittances," *Tufts Institute for Business in the Global Context*, February 25, 2022, <https://sites.tufts.edu/ibgc/el-salvador-and-the-potential-for-low-fee-crypto-remittances/>.

Another key statistic from this paper which could have significant repercussions is that democracies diminish theft and homicide rates whilst increasing burglary rates. The increase in burglary is an uninspiring result but it must be noted that it is not a violent crime and so any reduction to the theft and homicide rates, both of which are considered violent by nature, would lead to an increase in the wellbeing of people in Latin America.

In the same vein, foreign aid received by Latin American governments or domestic taxation which had previously been purposed for fighting crime might be better suited if it goes towards the strengthening of democratic institutions as these can have a positive effect on the economic wellbeing of the country in addition to reducing violent crime.

Inequality also increases violent crime as noted in Table 5, and as such Latin American countries might achieve better standards of living if revenue streams were distributed with the purpose of diminishing inequality. This is particularly important for reducing homicide rates as these crimes significantly affect the social fabric of a country much more than theft and burglary.

Table 8 also shows that poor countries suffer from higher homicide rates than rich countries, however it also shows that as GDP increases so do homicide rates which means that some countries might be increasing their GDP, but their law enforcement mechanisms are not being adequately or efficiently supported. This takeaway is incredibly important because it shows that an increase in revenue is not necessarily an increase in development.

Finally, these interpretations are all significant and have strong data to back them but the question which must be asked is whether remittance flows are sustainable over the long term as they depend entirely on migrants' abilities to find employment in foreign countries. Hence, countries in Latin America may also be forced to look at long term alternatives for remittances which provide the same benefits.

In terms of social remittances, these could be obtained via social media as the creation of the internet provides an easy mechanism for the flow of ideas from more developed nations into Latin America. Policies fostering technological education which allow people to utilize social media and telecommunications devices may act as a substitute for social remittances. However, any approach undertaken by Latin American governments must also ensure that the economic aspect of remittances is also replaced.

In terms of economic remittances, what is important is that they provide a motivation for education as an increase in education means people can secure steady revenue streams. An

alternative for this would be outsourcing work from foreign countries to the home country whilst also paying them higher wages than employees would receive working for local firms. An example of this could be multinational companies which set up offices in Latin America to deal with issues that can be dealt with over the internet, such as accounting or customer service. These would provide revenue streams for people in the home country without the need for migration.

With respect to remittances increasing homicides, it could be due to the fact that remittances and the economic and social benefits that they bring have nothing to do with the causes of crime. An increase in economic prosperity might not alleviate old resentments or manage to deal with the subpar social fabric, meaning that it does not reduce homicides. Another interpretation could be that, whilst the time fixed effect and between models alleviate endogeneity, they do not remove it entirely and as such the countries with higher homicide rates are the ones wherein people are forced to migrate resulting in higher remittance flows.

Nevertheless, the reduction of theft by way of remittances is significant especially as it deals with the issue of endogeneity, for it would not make sense that people migrate due to lower theft rates.

Conclusion and limitations

This paper set out to see whether remittances reduced or increased crime, however the only significant results for which endogeneity is not an issue is for theft rates. Remittance dependency reduces theft rates but increases homicide rate and there is no statistically significant relationship with burglary rates. In conclusion, the initial hypothesis that remittances decrease crime was wrong for homicides and burglaries but seems to point to theft decreasing as remittance dependency increases.

The relationship with theft may be attributed the nature of the crime which is more personal and carries more risk with it and, as such, citizens in countries which are dependent on remittances may choose not to rob others as the risk for it is not worth it when they have access to remittance streams. Furthermore, dependency also carries the educational incentive as migrants require some education to leave the country and access these income streams. However, not all those who receive an education in hopes of accessing foreign labor markets end up leaving the country which increases the country's educated population and also unlocks better job prospects for them at home.

There are still however, many steps to be taken for advancing this research. There are many unanswered questions due to a lack of data. One of the questions that needs to be answered is who is migrating to access the income streams; existing literature points towards an educated and skilled migrant but could it also be that those criminals themselves are migrating? Many of the remittances sent by migrants could be sent by illegal migrants who are working without permits. The question is whether those who are willing to take the risk to leave their country are also those who would, if forced to stay in the home country, engage in criminal activities such as theft.

Another variable which must be answered is whether educational expenditure by the state is affected by the remittance dependency but for Latin America there is simply not enough publicly available data on this. As the remittances provide a better income for families in the home country, these may now have the available funds to send children to private schools and as such there may be an inverse relationship between educational expenditure and remittance dependency as the state does not have enough demand for public education. There are studies which have claimed that remittances and foreign aid help prolong authoritarian governments in power as they are able to reduce discontent and give the government an "unearned" revenue source.⁶⁷ Due to this unearned

⁶⁷ Faisal Z. Ahmed, "The Perils of Unearned Foreign Income: Aid, Remittances, and Government Survival," *American Political Science Review* 106, no. 1 (February 2012): 146

revenue and a reduction in discontent, there is less pressure for the government to perform its role as public good provider, hence why remittances may be inversely correlated with public expenditure in healthcare and education.

Furthermore, there is also the question of the gender of the migrant and the gender of those who suffer from criminal offences, currently there is not enough data on this but with new movements such as “ni una más, ni una menos” the data could become available in the future. Some countries do include data on femicides, however the data utilized in this paper did not have sufficient gender separation to be able to incorporate it into the analysis.

This research could also include a behavioral study on the incentives to commit burglary as opposed to theft, because the increase in burglary as remittances increase (Table 5) could also be a shift from thieving as the risk/reward ratio for theft is too small as opposed to burglary which carries a lesser risk. In order to do this, the analysis would have to analyze and classify each state’s individual laws concerning homicide, theft, and burglary; currently the only variable which covers this in a broad manner is the State Fragility Index that gives an overview of the state’s effectiveness and legitimacy.

Furthermore, the variable on homicides must also be questioned in this analysis and cannot be accepted as entirely accurate, as Latin American countries have been known to manipulate data on homicides and classify them as “desaparecidos” or people who have simply disappeared. Further analysis into the impact of remittances on homicide rates would also have to account for disappearances as these often result in the same outcome as homicides, i.e., a person being eliminated from the population. For example, in 2012-2013 there was an alleged drop in homicides in El Salvador as a result of a truce between the government and organized criminal organizations, however the number has come into question as being dishonest because the number of disappearances disproportionately increased during the truce, meaning homicides might have taken place but the killers hid or destroyed the bodies successfully.⁶⁸

Finally, the last variable which would be incredibly significant in this research is the percentage of the population that is unbanked, as that would have a significant effect on the rate of burglary and theft. If people are more prone to keep their money and valuables at home or on

⁶⁸ Carlos Carcach and Evelyn Artola, “Disappeared Persons and Homicide in El Salvador,” *Crime Science* 5, no. 1 (December 2016): 13

their person as opposed to in a bank or financial markets, then there is a greater reward for those who choose to engage in burglary or theft.

Overall, there is strong evidence that remittance dependency reduces theft rates as the opportunity cost of engaging in theft as a way of subsistence is too high for remittance dependent countries. It must be noted that even for theft, the results are not enormous as the decreases in theft rates are low. Nevertheless, if any progress is to be made in Latin America to alleviate the overwhelming crime rates, all attempts must encompass multiple approaches one of which could be to facilitate remittance receipt.

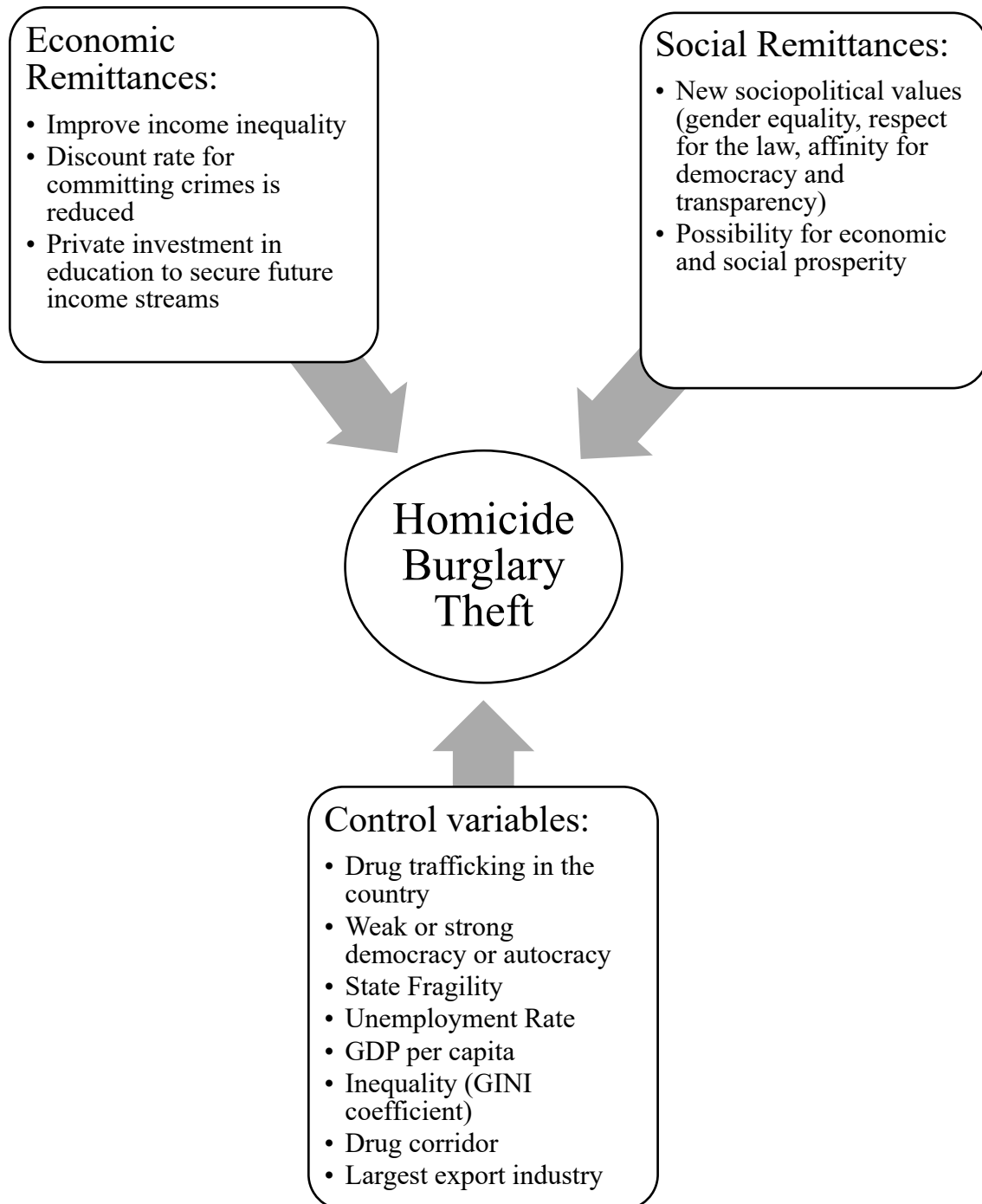
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Appendix A: Diagrams

Diagram 1: Variables' effect on crime



Appendix B: Graphs

Figure 1: Remittances Received

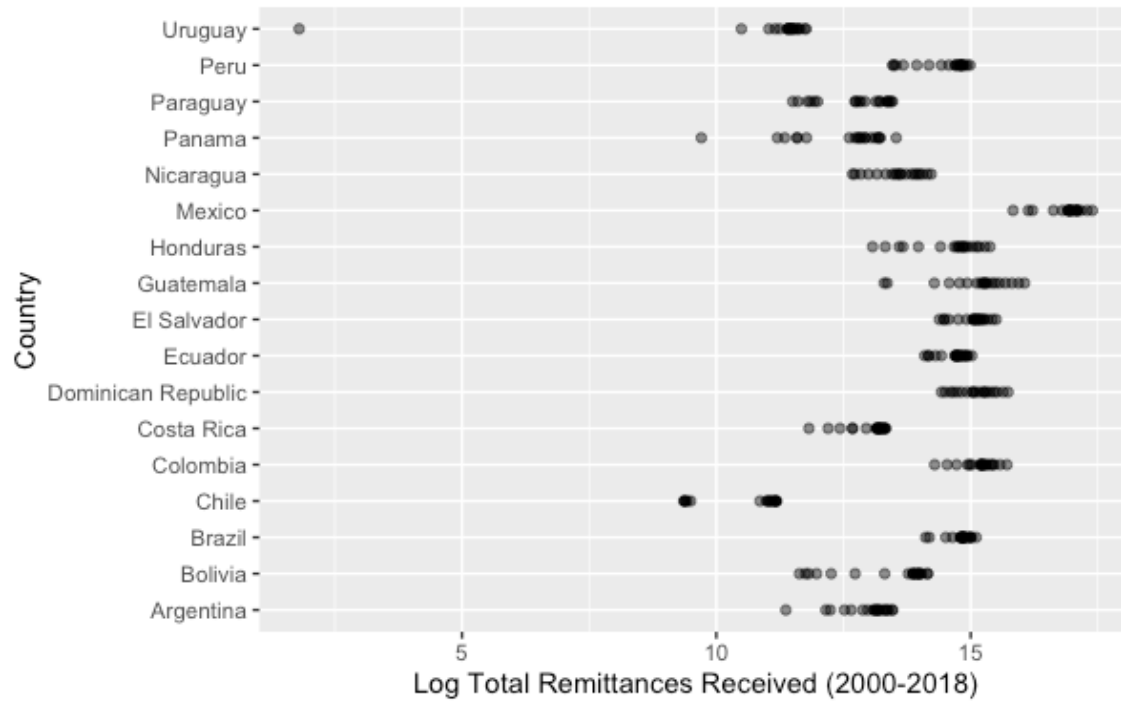


Figure 2: Remittance Dependency

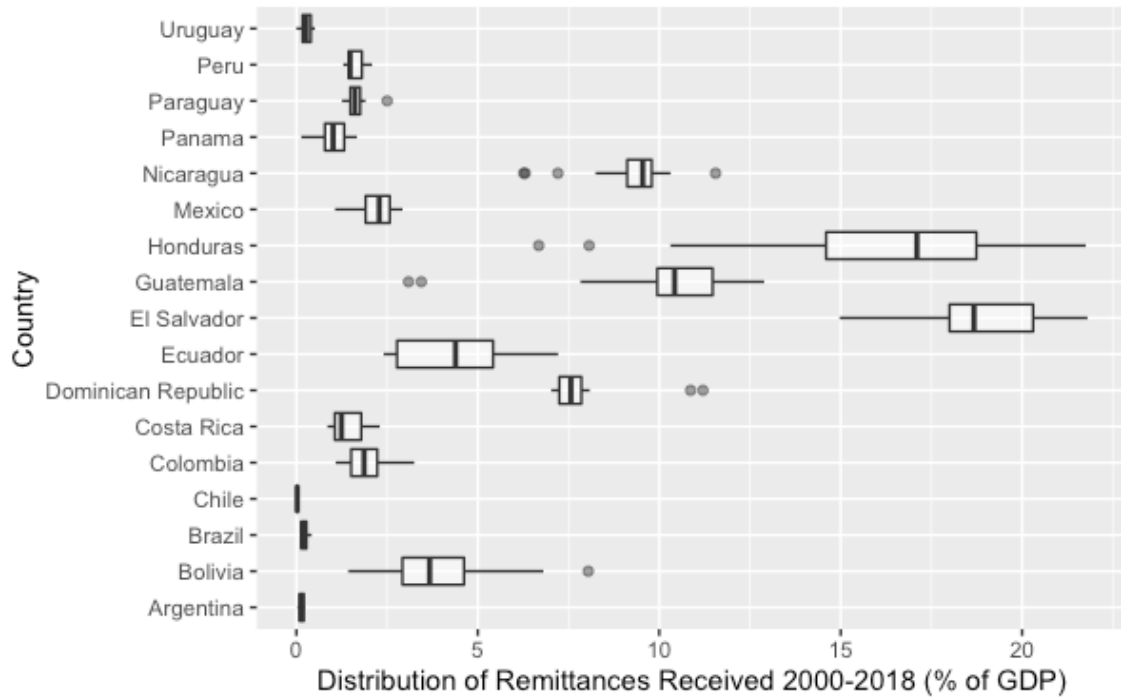


Figure 3: Impact of remittance dependency on crime

Figure 3.1: Homicides



Figure 3.2: Theft

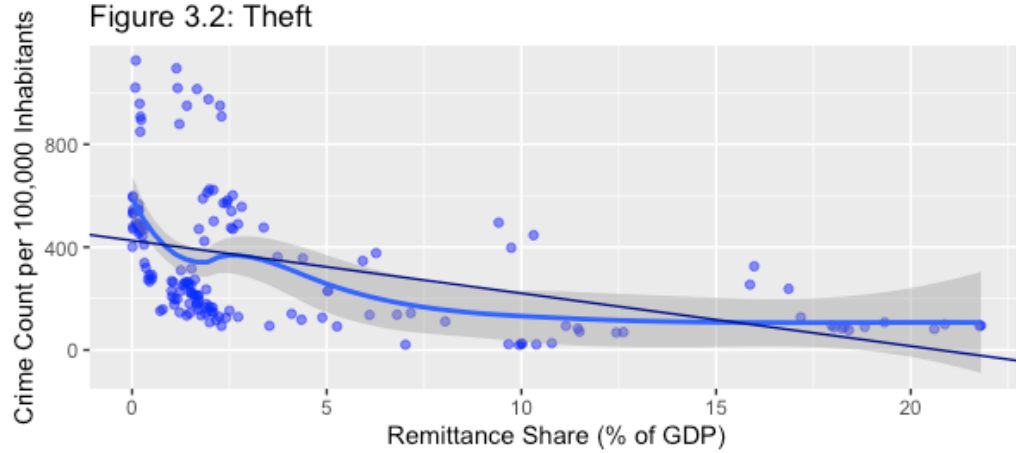
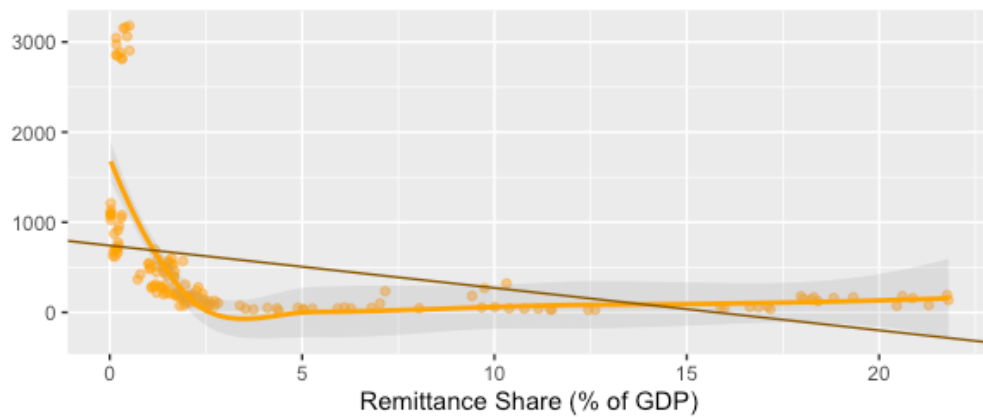


Figure 3.3: Burglary



Appendix C: Tables

Table 1: Summary of all data collected

Statistic	N	Mean	St. Dev.	Min	Max
Total Remittances (Thousands, current USD)	318	3,074,720.000	5,486,703.000	6.038	35,768,417.000
Remittances as % share of GDP	318	4.806	5.766	0.00003	21.803
GDP per capita (Current USD)	322	5,766.242	4,085.287	904.226	18,703.860
Homicides per 100,000	322	21.431	20.272	3.399	106.821
Theft count per 100,000	158	342.448	259.741	19.440	1,125.940
Burglary count per 100,000	156	535.508	770.147	17.260	3,179.510
Unemployment Rate (%)	322	6.167	3.163	2.020	20.520
Polity IV Democracy Index	322	8.134	1.227	4	10
State Fragility Index	322	6.761	3.699	1	16
Drug Corridor (Dummy)	322	0.590	0.493	0	1
Largest Export Industry (% of total exports)	322	40.133	11.375	4.170	73.950
GINI Coefficient	256	49.454	4.722	38.000	61.600

Table 2: Pooled OLS - Effect of % increases of Remittance Share (% of GDP) on % Crime

	Homicide	Theft	Burglary
Remittances as % share of GDP	0.106*** (0.012)	-0.093*** (0.024)	-0.065*** (0.023)
Log GDP per capita (Current USD)	0.878*** (0.080)	-0.008 (0.136)	0.610*** (0.129)
Polity IV Democracy Index	-0.151*** (0.035)	-0.223*** (0.055)	0.400*** (0.051)
State Fragility Index	0.089*** (0.019)	-0.153*** (0.029)	-0.0003 (0.027)
Metals	-0.705** (0.278)	0.029 (0.295)	-0.796*** (0.273)
Minerals	-0.264*** (0.099)	-0.092 (0.161)	-0.627*** (0.155)
Textiles	0.390** (0.190)	0.389 (0.347)	0.741** (0.325)
Unemployment Rate (%)	0.064*** (0.011)	-0.040* (0.021)	0.114*** (0.018)
GINI Coefficient	0.086*** (0.010)	0.026 (0.017)	-0.013 (0.014)
Adjusted R ²	0.740	0.680	0.882
Breusch Pagan test results (p-value)	0.000	0.024	0.001

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 3: Pooled OLS - Effect of % increases of Total Remittances on % Crime

	Homicide	Theft	Burglary
Log total remittances	0.219*** (0.035)	-0.263*** (0.062)	-0.136** (0.058)
Log GDP per capita (Current USD)	0.410*** (0.077)	0.491*** (0.122)	0.928*** (0.117)
Polity IV Democracy Index	-0.103* (0.042)	-0.307*** (0.064)	0.373*** (0.061)
State Fragility Index	0.089*** (0.020)	-0.128*** (0.029)	0.016 (0.027)
Electronics	-0.185 (0.166)	0.544** (0.191)	-1.202*** (0.185)
Unemployment Rate (%)	0.063*** (0.011)	-0.049** (0.021)	0.113*** (0.019)
Drug Corridor (Dummy)	0.090 (0.114)	-0.130 (0.161)	-0.225 (0.156)
GINI Coefficient	0.056*** (0.009)	0.050*** (0.016)	0.0002 (0.014)
Adjusted R ²	0.707	0.689	0.880
Breusch Pagan test results (p-value)	0.001	0.001	0.000

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 4: Time Fixed Effects - Effect of % increases of Remittance Share (% of GDP) on % Crime

	Homicide	Theft	Burglary
Remittances as % share of GDP	0.093*** (0.009)	-0.078*** (0.011)	-0.003 (0.016)
Polity IV Democracy Index	-0.193*** (0.040)	-0.252*** (0.055)	0.481*** (0.080)
State Fragility Index	-0.026 (0.016)	-0.170*** (0.021)	-0.068** (0.030)
Largest Export Industry (% of total exports)	-0.003 (0.003)	-0.009** (0.004)	0.008 (0.007)
Drug Corridor (Dummy)	0.132 (0.088)	-0.306** (0.124)	-0.759*** (0.178)
Poor Country (Dummy)	-0.554*** (0.123)	0.387** (0.175)	-0.813*** (0.251)
GINI Coefficient	0.116*** (0.011)	-0.001 (0.016)	0.027 (0.022)
Adjusted R ²	0.617	0.597	0.621

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 5: Time Fixed Effect Regressions - Effect of % increases of Remittance on % Crime

	Homicide	Theft	Burglary
Log total remittances	0.121** (0.052)	0.017 (0.071)	-0.232*** (0.081)
Polity IV Democracy Index	-0.322*** (0.055)	-0.057 (0.075)	0.334*** (0.085)
State Fragility Index	-0.068*** (0.019)	-0.157*** (0.026)	-0.049 (0.030)
Largest Export Industry (% of total exports)	0.001 (0.005)	-0.008 (0.006)	-0.003 (0.007)
Drug Corridor (Dummy)	0.479*** (0.109)	-0.734*** (0.147)	-0.562*** (0.166)
Poor Country (Dummy)	0.216 (0.132)	-0.175 (0.188)	-0.982*** (0.203)
GINI Coefficient	0.084*** (0.013)	0.050*** (0.017)	0.031 (0.019)
Adjusted R ²	0.434	0.416	0.648

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 5: Time Fixed Effect Regressions - Effect of % increases of Remittance on % Crime

	Homicide	Theft	Burglary
Log total remittances	0.121** (0.052)	0.017 (0.071)	-0.232*** (0.081)
Polity IV Democracy Index	-0.322*** (0.055)	-0.057 (0.075)	0.334*** (0.085)
State Fragility Index	-0.068*** (0.019)	-0.157*** (0.026)	-0.049 (0.030)
Largest Export Industry (% of total exports)	0.001 (0.005)	-0.008 (0.006)	-0.003 (0.007)
Drug Corridor (Dummy)	0.479*** (0.109)	-0.734*** (0.147)	-0.562*** (0.166)
Poor Country (Dummy)	0.216 (0.132)	-0.175 (0.188)	-0.982*** (0.203)
GINI Coefficient	0.084*** (0.013)	0.050*** (0.017)	0.031 (0.019)
Adjusted R ²	0.434	0.416	0.648

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 6: Country Fixed Effects - Effect of % increases of Remittance Share (% of GDP) on % Crime

	Homicide	Theft	Burglary
Remittances as % share of GDP	0.011 (0.010)	0.037 (0.037)	-0.031 (0.031)
Log GDP per capita (Current USD)	0.109* (0.061)	0.546*** (0.149)	0.397** (0.155)
Polity IV Democracy Index	0.039 (0.030)	-0.021 (0.085)	-0.113 (0.086)
State Fragility Index	0.023* (0.013)	0.022 (0.029)	-0.041 (0.029)
Largest Export Industry (% of total exports)	-0.005** (0.002)	-0.001 (0.005)	0.002 (0.005)
Unemployment Rate	0.039*** (0.009)	-0.013 (0.026)	0.016 (0.024)
Adjusted R ²	0.025	0.125	0.061

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Table 7: Country Fixed Effect Regressions - Effect of % increases of Remittances on the % of Crime Rates

	Homicide	Theft	Burglary
Log total remittances	0.082** (0.039)	0.067 (0.133)	-0.108 (0.131)
Log GDP per capita (Current USD)	0.057 (0.065)	0.499*** (0.163)	0.471*** (0.168)
Unemployment Rate	0.039*** (0.009)	-0.013 (0.026)	0.020 (0.024)
GINI Coefficient	-0.001 (0.008)	-0.004 (0.018)	0.025 (0.018)
Adjusted R ²	0.037	0.118	0.058

Notes:

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 8: Between Model Regressions - Effect of % increases of Remittance Share (% of GDP) on % Crime

	Homicide	Theft	Burglary
Remittances as % share of GDP	0.193*** (0.029)	-0.166*** (0.050)	-0.026 (0.056)
Log GDP per capita (Current USD)	1.440*** (0.329)	-1.246** (0.524)	0.087 (0.608)
State Fragility Index	0.152** (0.060)	-0.272** (0.111)	-0.044 (0.123)
Largest Export Industry (% of total exports)	0.007 (0.010)	-0.019 (0.018)	0.024 (0.021)
Drug Corridor (Dummy)	0.074* (0.038)	0.044 (0.089)	0.217* (0.108)
Poor Country (Dummy)	0.148*** (0.031)	0.001 (0.065)	-0.029 (0.073)
GINI Coefficient	-19.479*** (4.251)	22.038** (6.900)	0.678 (7.564)
Adjusted R ²	0.843	0.458	0.601

Notes:

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 9: Between Model Regressions - Effect of % increases of Remittance on % Crime

	Homicide	Theft	Burglary
Log total remittances	0.251 (0.219)	-0.444* (0.232)	-0.283 (0.205)
Log GDP per capita (Current USD)	-0.304 (0.490)	0.159 (0.510)	0.443 (0.441)
Polity IV Democracy Index	-0.179 (0.297)	-0.435 (0.320)	0.248 (0.276)
State Fragility Index	-0.074 (0.115)	-0.127 (0.133)	-0.005 (0.110)
Largest Export Industry (% of total exports)	0.006 (0.026)	-0.028 (0.026)	0.008 (0.023)
Unemployment Rate	0.053 (0.087)	0.040 (0.114)	0.197* (0.100)
GINI Coefficient	0.100 (0.070)	0.070 (0.078)	-0.020 (0.066)
Adjusted R ²	0.189	0.151	0.663

Notes:

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.