The Interplay between Organized Crime, Foreign Direct Investment and Economic Growth: The Latin American Case

Silvia C. Gómez Soler

Abstract

Latin America has been seen over the years as a violent region. Organized crime has been a major factor contributing to that perception. Crime not only makes daily life more dangerous for citizens of a country, but can even challenge the viability of governments. Crime fighting efforts drain state resources, threaten the delivery of public services, and might have a negative influence on institutional stability and business environment. The purpose of this paper is to extend the empirical framework of Bengoa and Sanchez-Robles (2002) to cover the relationship between organized crime, foreign direct investment and growth. Although the relationship between organized crime and foreign direct investment is not widely discussed in the literature, it can be argued that there is a very important channel through which this relationship might exist: institutional instability of states and viability of governments. The paper finds that there is not a significant correlation between organized crime and foreign direct investment flows. The results also show that there is a negative relationship between FDI and growth. The relationship between FDI and growth was explored cautiously because the economic literature suggests that there is a two-way causal link between these two variables. That possible source of endogeneity in the analysis is addressed econometrically in this paper using the Two Stage Least Squares (2SLS) technique. The use of 2SLS was not originally considered by Bengoa and Sanchez-Robles (2002), and therefore it is an additional contribution of this paper to the literature.

Keywords: organized crime, foreign direct investment, Economic growth, Latin America

JEL Classification: F21, F36, O40

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La Interacción entre Crimen Organizado, Inversión Extranjera Directa, y Crecimiento Económico: El Caso Latinoamericano†

Silvia C. Gómez Soler

Resumen
A lo largo de los años, América Latina ha sido considerada como una región con problemas de violencia. El crimen organizado ha sido un factor importante que ha contribuido a tal percepción. El crimen no sólo hace que el día a día de los ciudadanos de un país sea más peligroso, sino que también puede comprometer la viabilidad de los gobiernos. Los esfuerzos realizados para luchar contra el crimen organizado absorben una parte significativa de los recursos del Estado, amenazan la provisión de servicios públicos, y pueden llegar a tener un efecto negativo sobre la estabilidad institucional y el clima de negocios. El objetivo de este trabajo es extender la estrategia empírica de Bengoa y Sanchez-Robles (2002) para analizar la relación entre el crimen organizado, la inversión extranjera directa y el crecimiento económico. Aunque la relación entre el crimen organizado y la inversión extranjera directa no ha sido discutida ampliamente en la literatura, es posible argumentar que hay un canal muy importante por medio del cual tal relación podría existir: inestabilidad institucional de los Estados y viabilidad de los Gobiernos. Este trabajo encuentra que no hay una correlación significativa entre el crimen organizado y los flujos de inversión extranjera directa (IED). Los resultados también muestran que existe una relación negativa entre la IED y el crecimiento económico. La relación entre la IED y el crecimiento fue explorada con cautela porque la literatura económica sugiere que existe una relación causal de dos vías entre estas dos variables. Esta posible fuente de endogeneidad se aborda econométricamente utilizando la técnica Mínimos Cuadrados Ordinarios en Dos Etapas (2SLS). El uso de 2SLS no fue considerada inicialmente por Bengoa y Sanchez-Robles (2002), y por tanto es una contribución adicional de este trabajo a la literatura.

Palabras Clave: crimen organizado, inversión extranjera directa, crecimiento económico, Latinoamérica

Clasificación JEL: F21, F36, O40

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I. Introduction

For many years, Latin America has been seen as a violent region. Organized crime has been a major factor contributing to that perception. The fact that some countries from the area are major producers of drugs or are routes for the international drug traffic cartels has important implications for organized crime, and has increased the concern over the negative repercussions of this phenomena in regional growth (Soares and Naritomi 2010). Pion-Berlin and Trikunas (2011) highlight that high levels of criminal violence not only make daily life more dangerous for citizens of a country, but can even challenge the viability of governments. In fact, crime fighting efforts drain state resources and threaten the delivery of other public services (Pion-Berlin and Trikunas 2011). Furthermore, Soares and Naritomi (2010), highlight the impact of organized crime on institutional stability and business environment.

Some years ago, Bengoa and Sanchez-Robles (2002) explored the interplay between economic freedom, foreign direct investment (FDI) and economic growth using panel data analysis for a sample of 18 Latin American countries. The purpose of this paper is to extend the empirical framework of Bengoa and Sanchez-Robles (2002) to cover the relationship between organized crime, foreign direct investment and growth. Considering that organized crime has an important impact on institutional stability and business environment, it makes sense to analyze the interplay between these variables.

The literature that studies the relationship between crime and foreign direct investment is very limited. In fact, only one paper directly examines this relationship in Latin America. Manrique (2006) analyzes the relationship between organized crime and foreign direct investment. According to his research, organized crime intimidates civil society, and the social and economic costs of insecurity affect foreign investment, as infrastructure is destroyed and additional security services are needed. Daniele and Mariani (2010) also contribute to the analysis, but using the Italian case. They analyze the geography of organized crime in Italy and estimate its impact on the distribution of FDI inflows at the provincial level using different kinds of crime data. The results show that the correlation between organized crime and FDI inflows into the Italian provinces is negative and significant (Daniele and Mariani 2010).

Although the relationship between organized crime and foreign direct investment is not widely discussed in the literature, I argue that there is a very important channel through which this relationship might exist: institutional instability of states and viability of governments.

Pion-Berlin and Trinkunas (2011), highlight that the real risk to both individual and national security can be found in violent, well-organized nonstate actors. These actors include youth gangs, transnational criminal-trafficking organizations, and terrorists. Pion-Berlin and Trinkunas (2011) add that these groups are very violent, well armed, and well funded. As part of their illegal activities, they are ready to compete with each other for control over drugs and contraband (Pion-Berlin and Trinkunas 2011). According to Bagley (2004), patterns of patrimonial rule, clientelism, and bureaucratic corruption in Latin America have encouraged organized crime groups to use tactics of bribery, blackmail and intimidation to maintain their illicit businesses. In fact, as Buscaglia and van Dijk (2003) highlight, organized crime is more than an isolated criminal phenomenon; there are links between the political, socio-economic, criminal justice and legal domains.

Research carried out by Buscaglia and van Dijk (2003) shows that levels of organized crime and corruption in the public sector are primarily determined by the quality of core public state institutions,
such as the police, prosecution and the courts. According to these authors, this relationship holds for countries at all levels of development. Additionally, this study highlights that independently from these institutional determinants, high levels of organized crime and corruption are linked to low levels of human development, generating a vicious circle of poverty exploited and compounded by organized crime. In fact, Buscaglia and van Dijk (2003) show that organized crime and corruption prosper in an environment of bad governance.

Nagle (2002) points out that organized crime was part of the fabric of Latin American governments for most of the twentieth century, and despite efforts to combat it, transnational criminal activities are thriving in the hemisphere. In fact, the fragility of the rule of law in Latin America has allowed organized criminal enterprises to take root (Nagle 2002). Buscaglia and van Dijk (2003) also highlight that poverty and unemployment do not just provide a greater supply of potential illegal labor for organized criminal activities, but they also create a favorable environment for criminals to exploit the social fabric of countries as a foundation for organized crime. This is indeed a big problem in Latin America where the levels of poverty and unemployment are high.

This paper finds that there is not a significant correlation between organized crime and foreign direct investment flows. The results also show that there is a negative relationship between FDI and growth. The relationship between FDI and growth was explored cautiously because the economic literature suggests that there is a two-way causal link between these two variables. That possible source of endogeneity in the analysis is addressed econometrically in this paper using the Two Stage Least Squares (2SLS) technique. The use of 2SLS was not originally considered by Bengoa and Sanchez-Robles (2002), and therefore it is an additional contribution of this paper to the literature.

The paper is organized as follows: in section 2 a review of the literature is presented; the conceptual framework is presented in section 3; in section 4 the model specification is introduced; the data is presented in section 4; econometric strategy and results are presented in section 5; and section 6 concludes.

II. Literature Review

There are a number of papers that have explored the determinants of foreign direct investment for the Latin American case. Those studies have pointed out the importance of variables like market size, macroeconomic stability and capital liberalization as determinants of foreign direct investment. But yet, as mentioned earlier, only one directly examines the relationship in Latin America (Manrique 2006). In what follows, a brief review of the literature of the determinants of foreign direct investment in Latin America, and of the relationship between FDI and growth will be examined. This overview of previous literature is relevant because it gives an outlook of the variables that should be included in the econometric model. The review of the literature is limited to the Latin American case given the focus of the paper. For a general survey of the determinants of foreign direct investment, and the relationship between FDI and economic growth refer to Nunnenkamp and Spatz (2002), Borensztein, Lee and De Gregorio (1998), and Agarwal (1980).
A. Determinants of Foreign Direct Investment in Latin America

Montero (2008) uses panel data for fifteen countries to study the determinants of foreign direct investment in Latin America. Montero (2008) argues that foreign investors view current account surpluses or low deficits as credible signs of a commitment to good macroeconomic management. Additionally, this study finds that infringements of political and civil rights and the relative level of political terror are not consistent predictors of foreign direct investment.

Biglaiser and DeRouen (2006) analyze the effect of different economic reforms for attracting foreign direct investment using a panel-corrected standard error procedure. In contrast to Montero (2008), this paper highlights that attempts to minimize expropriation risk enhances foreign investor interest. Additionally, good governance is argued to be an important factor for attracting foreign direct investment. However, according to Biglaiser and DeRouen (2006), most economic reforms including international capital liberalization, tax reform and privatization, have a limited effect on foreign direct investment.

Fukumi and Nishijima (2010) use panel data of 19 countries in Latin America and the Caribbean to show the relationship between Foreign Direct Investment (FDI) and institutional quality. They use the average of three indexes (law and order, bureaucratic efficiency and corruption) to create an index that assesses institutional quality. Fukumi and Nishijima (2010) find that FDI could improve the quality of institutions, while better institutions could attract more FDI into the region. They show that factors such as the improvement of macroeconomic performance, liberalization and reform of institutions attract investors (Fukumi and Nishijima 2010). The results of this empirical analysis indicate that an increase in FDI inflows, accompanied by easing of capital controls can play a crucial role in improving institutional quality. Fukumi and Nishijima (2010) highlight that the region is in urgent need of institutional reform.

In sum, the papers mentioned above highlight the importance of including variables related to macroeconomic performance and institutional background in the specification used to analyze the determinants of foreign direct investment.

B. Foreign Direct Investment and Growth in Latin America

Using a panel data econometric approach, Zhang (2001) analyses eleven economies in Latin America and East Asia to show that the extent to which foreign direct investment enhances growth depends on country specific characteristics. He uses Granger causality tests to establish the causal relationship between FDI and GDP. In fact, Zhang (2001) shows that there are significant differences between East Asia and Latin America when patterns of foreign direct investment growth are compared. The country specific characteristics that Zhang (2001) highlights are education, macroeconomic stability, liberalization of the trade regime, and incentives for export oriented foreign direct investment.

Mengistu and Adams (2007) use a cross-section dataset of 88 developing countries to show that foreign direct investment is positively and significantly correlated with economic growth. Additionally, they show that a country’s institutional infrastructure is positively and significantly correlated with economic growth. In this paper a political risk measure is taken as a proxy of institutional or governance infrastructure. In the same line of analysis as Mengistu and Adams (2007), Hsiao and Chen (2003)
explore the importance of institutions and urbanization in the analysis of the relationship between foreign direct investment and economic growth. They use a panel of 23 developing countries covering a time period between 1976 and 1997 to analyze the factors that determine FDI. The results of this study show that economic growth, predictable behavior, trustworthiness and commitment from governing institutions, infrastructural development of cities, and lower tax rates are important factors that attract foreign direct investment. Additionally, Hsiao and Chen (2003) argue that there is a feedback relation between FDI and economic growth.

Sylwester (2005) explores how foreign direct investment affect economic growth in 29 less developed countries using a cross section that covers the period between 1970 and 1989. He uses proxies of economic openness, political instability, and schooling as control variables. Sylwester (2005) finds a positive relation between foreign direct investment and economic growth, and further claims that there is no evidence that FDI raises income inequality. His main argument is that finding ways to attract foreign direct investment can promote growth without skewing income distributions.

Contrary to the other papers referenced in this literature review, Tsai (1994) does not find any strong effects from FDI on growth in a sample of LDCs taken from the 1970s and 1980s. Tsai (1994) argues that ignoring the simultaneity between determinants and consequences of FDI is very likely to lead to unreliable results, and therefore he uses a simultaneous equation model with economic growth and FDI per capita as dependent variables.

In sum, the papers mentioned above highlight the importance of including variables related to macroeconomic performance, institutional background, and educational levels in the specification used to determine the relationship between foreign direct investment and growth.

To close this literature review, it is important to mention the contribution of De Mello (1997), who surveys the latest developments in the literature that relates foreign direct investment and growth in developing countries. De Mello’s work is a great reference for those interested in a more complete perspective of the literature in this area.

### III. Conceptual Framework

Following Manrique (2006) it is argued that organized crime, through its effects on the social and economic costs of insecurity, affects foreign investment. Organized crime is associated with high costs as infrastructure is destroyed and additional security services are needed, affecting the flow of foreign direct investment. Therefore, we argue that there is a one-way relationship between organized crime and foreign direct investment. Organized crime might have a direct influence over economic growth as well. In this paper I am not going to explore the direct relationship that might exist between organized crime and economic growth because it goes beyond my scope, but it can be considered for future research.

*Figure 1*
Economic theory has pointed to a causal relationship between economic growth and FDI that can run in either direction (Tsai 1994). On one direction, foreign direct investment flows can be induced by host country economic growth if the host country offers a sizeable consumer market. According to Dhakal et al (2007), foreign direct investment serves as a substitute for commodity trade, and leads to greater economies of scale and cost efficiency in the host country. On the other direction, foreign direct investment can contribute to host country economic growth, by increasing the country’s capital stock. According to Dhakal et al (2007), this is done by introducing complementary inputs, inducing technology transfer and skill acquisition, or increasing competition in the local industry.

IV. Model Specification

In this empirical exercise, two different models are used to analyze the interplay between organized crime, foreign direct investment and economic growth. One model is used to estimate the determinants of foreign direct investment and another model is used to determine the relationship between foreign direct investment and economic growth. In what follows the economic rationale of these two models will be explored.

A. Determinants of Foreign Direct Investment

Following Montero (2008), the following foreign direct investment function will be estimated:

\[(FDI)_{it} = f[(LGDP)_{it-1}, REX_{it}, DS_{it}, AIRT_{it}, GED_{it}, CR_{it}, EF_{it}, OC_{it}, O_{it}] + \epsilon_{it}\]

Where:

FDI is the ratio of FDI inflows to real GDP (constant 2000 US$); LGDP is the lagged log of real GDP (constant 2000 US$); REX is the real exchange rate; DS is the ratio of debt service payments to exports of goods and services; AIRT is the air transport freight as ratio to country size; GED is the government expenditures on education as a percentage of GNI (constant 2000 US$); CR is the credit channeled by
the banking system to the private sector as a percentage of GDP; EF is the economic freedom index generated by the Fraser Institute; OC is a proxy for organized crime; and CO is a proxy for corruption.

**B. Economic Rationale for the Foreign Direct Investment Model**

This section presents the economic rationale for the variables included in the model. The focus of this empirical paper is on the relationship between organized crime and foreign direct investment. Therefore, the variable that takes most of our attention is organized crime. It is not easy to quantify organized crime. Data are often lacking and the number of observations tends to under-report the effective dimension of the problem. Notwithstanding these limitations, the variable organized crime (OC) is quantified using survey data from the World Economic Forum's Executive Opinion Survey about the costs of organized crime on businesses. This variable makes a good proxy of organized crime in this case. Organized crime has an important negative impact on institutional stability and business environment. Therefore, it follows that when companies perceive high costs associated with organized crime, the levels of foreign direct investment should be lower. It would be expected that the coefficient of this variable is negative.

The lagged log of real GDP (LGDP) is used as proxy of Latin America’s potential market size because foreign investors make their investment decisions based on expectations generated, in part, by what the level of real GDP was in the preceding year. This variable was lagged to avoid the simultaneity problem that might arise when incorporating this variable as a regressor (Ramirez 2010). It would be expected that the coefficient of this variable is positive.

The real exchange rate is included in the model because it relates economic policy and international competitiveness. According to Ramirez (2010), a real depreciation of the domestic currency should increase the profitability of these sectors and, ceteris paribus, induce FDI flows to them. A real depreciation of the domestic currency reduces the (dollar) value of the profits and dividends sent back to the host company, thereby reducing the real rate of the investment. The variable is lagged because the decision to invest in capital in a foreign country takes time due to implementation and institutional-legal delays (Ramirez 2010). It would be expected that the coefficient of this variable is negative. The standard deviation of the real exchange rate, is also included to capture the impact of exchange rate volatility on FDI flows. It would be expected that the coefficient of this variable is negative because the more volatile REX is, the greater the uncertainty for foreign investors.

The debt service payments to exports ratio (DS), is included to measure country risk. The higher the ratio, the greater the probability that a balance of payments crisis will emerge which would hinder FDI flows to the country (Ramirez 2010). It would be expected that the coefficient of this variable is negative.

The air transport freight as ratio to country size (AIRT) is included in the model. It is hypothesized that countries with better infrastructure are more attractive to foreign investors because they tend to have lower transportation costs. It would be expected that the coefficient of this variable is positive.

Government expenditures on education as a percentage of GNI (GED) are included as proxy for human capital. It would have been preferable to use the secondary or tertiary enrollment ratio, but these
variables were not available for every year of this study. The rationale for using this variable is that the higher the level of education, the more attractive it is to foreign investors both from a cost standpoint (lower unit labor costs) and a demand-side perspective (greater purchasing power and more informed consumers) (Ramirez 2010). It would be expected that the coefficient of this variable is positive.

The credit channeled by the banking system to the private sector as a percentage of GDP (CR) is expected to have a positive impact on foreign direct investment flows (positive coefficient). The credit constraint can be problematic in terms of financing the construction of new plant, machinery, and equipment (Ramirez 2010).

The variable corruption (CO) is quantified using survey data from the World Economic Forum's Executive Opinion Survey about the costs of corruption on businesses. When companies perceive high costs associated with corruption, the levels of foreign direct investment should be lower. It would be expected that the coefficient of this variable is negative.

The Index of Economic Freedom (EF) is a composite index, designed by the Heritage Foundation, which ranges from 0 to 100. It is based on an aggregation of 10 equally weighted component measures of freedom: business freedom, trade freedom, monetary freedom, freedom from government, fiscal freedom, property rights, investment freedom, financial freedom, freedom from corruption and labor freedom. This variable can help us assess whether the countries in the sample have conditions consistent with economic liberalization that are perceived as incentives for business activity, and are thus attractive to investors. It would be expected that the coefficient of this variable is positive.

C. Relationship between FDI and Growth

Tsai (1994) highlights that not only can the inflow of FDI affect the host country's economic growth, but economic growth can in turn affect the direction and volume of FDI. This suggests that the simultaneity between the determinants and the consequences of FDI should not be dismissed. A model that fails to capture the interdependence of the determinants and the consequences of FDI is flawed. As Tsai (1994) mentions, using ordinary least squares (OLS) estimates of a single regression equation are very likely to be biased and inconsistent. According to Zhang (2001) “countries with fast economic growth, not only generating more demand for FDI but also providing better opportunities for making profits, attract greater FDI […] On the other hand, FDI inflows may foster economic growth of host countries through positive direct effects.” Considering the potential biased results that this bidirectional causality might generate in an OLS estimation, a Two Stages Least Squares (2SLS) methodology will be implemented in the econometric section of this paper.

Following Barro (1996) we use the following growth equation in this empirical exercise:

\[ G_{it} = \beta_0 + \beta_1 \ln y_{i,72} + \beta_2 POP_{i,t} + \beta_3 SCH_{i,72} + \beta_4 INV_{i,t} + \beta_5 FDI_{i,t} + \beta_6 RULE_{i,t} + \epsilon_{it} \]

where \( G_{it} \) is the real GDP per capita growth of country i; \( \ln y_{i,72} \) is the initial level of real GDP per capita (1972); \( POP_{i,t} \) is the population growth; and \( SCH_{i,72} \) is the initial level of secondary school enrollment (1972); \( INV_{i,t} \) is the ratio of gross domestic investment to GDP; \( RULE_{i,t} \) is the rule of law index; and \( FDI_{i,t} \) is the ratio of FDI inflow to GDP.
V. Data

To build the country panel for this empirical paper, information from the Inter American Development Bank’s Governance Indicators base (DataGov), the ECLAC Databases and Statistics Website, and the World Bank’s World Development Indicators (WDI) were used. The variables included were discussed in detail in the previous section. Data for nineteen Latin-American countries is contained in the sample: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. The panel includes country level data from 2002 to 2010.

Table 1, included in the annex, provides summary statistics of the variables included in the econometric models estimated in this paper. A key feature of this dataset is that very few observations are missing; observations about infrastructure (AIRT) are missing for a few countries (Dominican Republic, Guatemala, Honduras, Nicaragua, and Paraguay) and information about the real exchange rate (REX) is only missing for Argentina.

VI. Econometric Strategy

In this empirical exercise panel data is used to understand the relationship between organized crime and FDI, and the relationship between FDI and growth. Panel data provides both a spatial and temporal dimension to the analysis. According to Yaffee (2003), this combination of time series with cross-sections can enhance the quality and quantity of data in ways that would not be possible by only using one of these two dimensions.

A. Econometric Approach – Determinants of Foreign Direct Investment

In the first part of this econometric section, fixed effects and random effects models are estimated to study the determinants of foreign direct investment. A fixed effect model assumes differences in intercepts across groups or time periods. According to Yaffee (2003), in this model the slope is constant but intercepts differ according to the cross-section, in this case, the country. Although there are no significant temporal effects, there are significant differences among countries in this type of model. While the intercept in this case differs from country to country, it may or may not differ over time. Torres (2007) highlights that when using a fixed effects model it is assumed that something within the individual may impact or bias the predictor or outcome variables and is necessary to control for this. This model removes the effect of time-invariant characteristics from the predictor variables so that it is possible to assess the net effect of the predictor. The equation for the fixed effects model is:

$$ FDI_{it} = \alpha_i + \beta_1 (LGD)_{it-1} + \beta_2 REX_{it} + \beta_3 DS_{it} + \beta_4 RAIL_{it} + \beta_5 GED_{it} + \beta_6 CR_{it} + \beta_7 EF_{it} + \beta_8 OC_{it} + \beta_9 CO_{it} + \epsilon_{it} $$

Where $\alpha_i$ is the unknown intercept for each country and $\epsilon_{it}$ is the error term.
On the other hand, a random effect model explores differences in error variances. Torres (2007) mentions that the rationale behind random effects model is that, unlike the fixed effects model, the variation across countries is assumed to be random and uncorrelated with the predictor or independent variables included in the model. This model should be used if there are reasons to believe that differences across countries have some influence on foreign direct investment. The random outcome is a function of a mean value plus a random error (Torres 2007). The equation for the random effects model is:

$$ FDI_{it} = \alpha + \beta_1 (LGDP)_{it-1} + \beta_2 REX_{it} + \beta_3 DS_{it} + \beta_4 RAIL_{it} + \beta_5 GED_{it} + \beta_6 CR_{it} + \beta_7 EF_{it} + \beta_8 OC_{it} + \beta_9 CO_{it} + u_{it} + \epsilon_{it} $$

Where $\alpha$ is the intercept, $u_{it}$ is the between country error, and $\epsilon_{it}$ is the within country error term.

The Hausman test is used to identify which model is appropriate in this case. The Hausman specification test is the classical test of whether the fixed or random effects model should be used (Yaffee 2003).

1. Determinants of Foreign Direct Investment: Results

The results of the econometric analysis are summarized in Table 2. Three different specifications were estimated (1), (2) and (3). According to the Hausman test, the model should be estimated using fixed effects. The results with random effects are also included in the table in columns (1b), (2b) and (3b).

The organized crime variable is significant at a 90% level in regressions (2b) and (3b). In these two regressions the model was estimated with random effects. These results are not very conclusive, because as mentioned earlier, according to the Hausman Test the model should be estimated with fixed effects. The coefficient obtained from this regression is positive, but it was expected for the sign to be negative. This result seems contradictory because one would expect that if companies perceive high costs associated with organized crime, the levels of foreign direct investment would be lower. However, the organized crime variable is not significant in any of the regressions that were run using fixed effects. According to these results, organized crime is not a significant determinant of flows of foreign direct investment to Latin American countries.
Table 2
Organized Crime and Foreign Direct Investment in Latin America

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<td>(0.0189692)***</td>
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<td>R^2 Within</td>
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<td>0.4469</td>
<td>0.1461</td>
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<td>R^2 Overall</td>
<td>0.0754</td>
<td>0.2389</td>
<td>0.0745</td>
<td>0.1517</td>
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<td>10.52</td>
<td>25.78</td>
<td>25.78</td>
<td>28.81</td>
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<td>0.1042*</td>
<td>0.0011***</td>
<td>0.0011***</td>
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Dependent Variable is the Ratio of Foreign Direct Investment Inflows to GDP
Std. Err. under coefficients (*: significant at 90%; **: significant at 95%; ***: significant at 99%).

According to the results, the lagged log of real GDP (LGDP), the credit channeled by the banking system to the private sector as a percentage of GDP (CR) and the ratio of debt service payments to exports of goods and services (DS) are important determinants of FDI flows in Latin America. LGDP has a positive and very significant (at a 99% level) effect on FDI flows in regressions (2) and (3). This variable is used as proxy of Latin America’s potential market size, and as expected, the observed
The coefficient is positive. The bigger the potential market size, the more likely a country is to receive flows of foreign direct investment. CR has a negative and very significant (at a 99% and 95% level, respectively) effect on FDI flows in regressions (2) and (3). This result contradicts the expected coefficient; it was expected for it to be positive. It could be argued that this result is reflecting the possibility that credit in Latin America is not being adequately used for financing production related activities, like the construction of new plants, machinery, and equipment. The debt service payments to exports ratio variable (DS), has a positive and significant (at a 90% level) effect on foreign direct investment flows in regressions (2) and (3). As mentioned previously, this variable is included to measure country risk; the higher the ratio, the greater the probability that a balance of payments crisis will emerge which would likely hinder FDI flows to the country. It was expected for the coefficient of this variable to be negative. However, the results of this empirical exercise show a different story. It could be argued that investors are risk loving, and are willing to invest under risky conditions if there are expectations of really high returns. This possibility could be explored in more detail in future research.

The estimations made by Bengoa and Sanchez-Robles (2002), show that the index of economic freedom has a positive and very significant effect on capital flows. However, the results presented in Table 2 contradict their findings. Economic freedom is only significant at 90% in specification (2b). Furthermore, according to the Hausman test that specification (random effects) is not adequate. The results of these two empirical exercises might differ because of two factors that are worth mentioning. First, the time period considered by Bengoa and Sanchez-Robles (2002) is much longer (1970 to 1999) than the time period considered in this paper (2002 to 2010), and the years studied don’t overlap. Because of that, this paper might be capturing different time specific effects. Second, this paper considers more control variables than Bengoa and Sanchez-Robles (2002).

B. Econometric Approach – Relationship between Foreign Direct Investment and Growth

An important source of endogeneity‡ is reverse causality. As mentioned previously, in this empirical exercise reverse causality is a problem because it is possible that not only foreign direct investment has an impact on growth, but at the same time growth has an impact on FDI. Using conventional methods to estimate this model, can lead to biased results. To address this problem and identify the effect of FDI on growth, a Two Stage Least Squares (2SLS) econometric strategy is used.

The goal of 2SLS in this case is to find a proxy for FDI that will not be correlated with the error term. We call this proxy \( \tilde{FDI} \). The purpose of the first stage of the two stage strategy is to generate the proxy, and the second stage is to substitute the proxy for FDI, and estimate the resulting equation with a pooled regression.

1. Relationship between Foreign Direct Investment and Growth: Results

The results of the econometric analysis are summarized in Table 3. The Sargan test signals that the null hypothesis that the instruments are uncorrelated with the error term cannot be rejected, and suggests that the specification of the equation is adequate. Additionally, both the Anderson and Cragg-Donald Wald

‡ Endogeneity occurs because an independent variable included in the model is potentially a choice variable, correlated with unobservables (error term).
statistics suggest that we can reject the null hypothesis of underidentification.

<table>
<thead>
<tr>
<th>Table 3</th>
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<td>Foreign Direct Investment and Growth in Latin America</td>
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<table>
<thead>
<tr>
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<tr>
<td>Intercept</td>
<td>-1.21311</td>
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<td>(6.53372)</td>
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<td>FDI</td>
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<td>POP</td>
<td>1.31870</td>
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<td>(0.7919)*</td>
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<td>ln y</td>
<td>-0.69200</td>
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<td></td>
<td>(0.8626)</td>
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<td>SCH</td>
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<tr>
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<td>(0.0520)**</td>
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<tr>
<td>RULE</td>
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<td>(0.5911)</td>
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<tr>
<td>INV</td>
<td>0.24232</td>
</tr>
<tr>
<td></td>
<td>(0.12850)**</td>
</tr>
</tbody>
</table>

Underidentification test (Anderson canon. corr. LM statistic): 39.452
Chi-sq(9) P-val = 0.000

Weak identification test (Cragg-Donald Wald F statistic): 6.097
Stock-Yogo weak ID test critical values: 5%
maximal IV relative bias 20.53

Sargan statistic (overidentification test of all instruments): 11.015
Chi-sq(8) P-val = 0.2008

Std. Err. under coefficients (*: significant at 90%; **: significant at 95%; ***: significant at 99%).

In the two stages least squares regression, the variable that quantifies the flows of foreign direct investment (FDI) has a negative and significant (at a 90% level) effect on growth, casting doubt on the overall general benefit of FDI inflows. This result confirms theories that predict that FDI will hurt resource allocation, and actually slows growth in the presence of preexisting trade, price, financial, and other distortions (Boyd and Smith 1992). There are important policy implications rising from this result. Developing countries in Latin America might need to reconsider the extensive use of subsidies, incentives and exemptions to attract foreign direct investment. But before taking any policy actions it is important to examine in more detail the specific case of the particular country, as the results of this empirical exercise are based on a cross section of countries.
Other variables included as controls are also significant. The initial level of secondary school enrollment (SCH), population growth (POP) and the ratio of gross domestic investment to GDP (INV) have a positive and significant effect on growth. This means that higher levels of education and gross domestic investment lead to higher economic growth. Economic theory supports these results.

VII. Conclusions

Organized crime has been a major factor contributing to the perception that Latin America is a violent region. The purpose of this paper is to extend the empirical framework of Bengoa and Sanchez-Robles (2002) to cover the relationship between organized crime, foreign direct investment and growth. Considering that organized crime has an important impact on institutional stability and business environment, it makes sense to analyze the interplay between these variables.

This paper finds that there is not a significant correlation between organized crime and foreign direct investment flows. The results also show that there is a negative relationship between FDI and growth. The relationship between FDI and growth was explored cautiously because the economic literature suggests that there is a two-way causal link between these two variables. That possible source of endogeneity in the analysis was addressed econometrically in this paper using the Two Stage Least Squares (2SLS) technique.

A problem encountered in this empirical exercise was the limited availability of information regarding costs of organized crime. The information for this variable is only available from 2002 to 2008. It is worth exploring the relationship between FDI and organized crime again when a longer series of data becomes available. The two stage least square technique might also be problematic because it is often difficult to find instruments that are both good at predicting the variable of concern, and yet are not determinants of the dependent variable. Consequently, it is possible that the 2SLS estimates are not robust to the choice of instrument. This issue was thoroughly explored in this paper using different tests. Results show that the instruments used are adequate. The issues analyzed in this empirical exercise are of great relevance to all countries in Latin America, and therefore researchers should be encouraged to consider the limitations mentioned above, and try to address them in their future research agenda.

This paper contributes to the literature by exploring a new methodology to understand the relationship between crime and foreign direct investment. The availability of related literature is very limited, and therefore it is suggested that researchers should further explore this topic in future research.
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