Does Violence Deter Investment and Hinder Economic Growth?*

Paulo R. A. Loureiro**

Emilson Caputo Delfino Silva***

Abstract

Using a panel of developed and developing countries, we investigate whether a country's investment and economic growth rate are negatively related to its violence level. Using GMM and Arellano-Bond procedures we found that violence is a strong deterrent to investment and thus hinders economic growth. Furthermore, we use a broader measure of violence that is able to account for civil war and violent deaths not reported as homicides. This broader measure of violence outperforms intentional homicides in explaining the effect of violence on both investment and economic growth.

Keywords: Violence, Life Expectancies, Developing Countries, Investment and Economic Growth.

JEL Codes: C23, O1, O11, O5.

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**Department of Economics, Universidade de Brasilia, Brasilia, D.F. 70190-045, Brazil.
E-mail: pauloloureiro@unb.br

***School of Economics, Georgia Institute of Technology, Atlanta, GA 30309-0615, USA.
E-mail: emilson.silva@econ.gatech.edu

1. Introduction

Does violence deter investment and subsequently hinder economic growth? According to conventional wisdom, the answer is affirmative. The higher the level of violence experienced by a region, the lower the region's investment attractiveness should be. Since economic growth is an increasing function of investment, violence should be harmful to economic growth. Using a panel of developed and developing countries, this paper investigates whether a country's investment level and economic growth rate are negatively related to its level of violence.

The connection between violence and economic performance is not new in economics. A pioneering study by Enders and Sandler (1991) estimates the relationship between terrorism and tourism for Spain and finds that terrorist events have had a significant negative impact on the number of tourists visiting Spain. Gaibulloev and Sandler (2008) presented panel estimates for 18 Western European countries to verify the impact of terrorism upon income per capita growth. They conclude that each additional transnational terrorist incident per million people reduces economic growth by about 0.4 percentage points. However, domestic terrorism had a much smaller effect on growth. More recently, Gries et al. (2009) verify the causal linkages between domestic terrorism and economic growth. Their findings indicate that the role of economic performance in determining terrorist violence appears to have been important for some countries. Furthermore, all attacked economies have been successful in adjusting to the threat of terrorism.

Suarez and Pshiva (2006) measure the impact of crime on firm investment by exploiting variation in kidnappings in Colombia from 1996 to 2002. Their central result is that firms invest less when kidnappings directly target firms, affecting both firms that sell in local markets and firms that sell in foreign markets. Broader forms of crime (homicides, guerrilla attacks, and general kidnappings), however, have no significant effects on investment.

Grun (2009) proposes a model in which households subject to violence decide jointly on migration and saving. The basic idea is that a higher asset stock is more difficult to carry over to a new place. When confronted with exogenous violence, households are expected to consider migration and to reduce their assets, both in order to reduce their exposure to violence and to make migration easier. Empirical evidence from rich Colombian microdata supports the conceptual framework for violence that carries a displacement threat, such as guerrilla attacks.

These studies inform us that some of the key reasons for the negative relationship between investment and violence are related to the fact that economic agents (firms and individuals) are sensitive to the set of environmental and institutional amenities offered by each competing prospective region when they make production or consumption location choices. With everything else being equal, a positive amenity, such as high quality public infrastructure, should attract firms, while a negative amenity, such as high violence, should inhibit or expel firms and consumers. As with the quality of regional public infrastructure, the level of re-

gional violence should depend partly on public policy.¹ The greater the amount of resources expended by a region in its law enforcement system, the lower its crime and violence should be. Crime and violence deterrence should also be higher where the penal system is stricter or more efficacious.

Although a country's level of violence may be sensitive to a flow of resources spent on law enforcement and to the strictness or efficacy of its penal system, one does not generally observe much variance in a country's violence levels over time. There appears to be considerable persistence in violence: not only highly violent countries seem to remain highly violent for a long period of time, but also peaceful countries do not typically become highly violent very rapidly. Such inertia in violence may help us to understand why violence is deemed to be a significant deterrent to investment. Some investors may not believe that a country's violence characteristic can be very much influenced by public policy even in the long run.

Our preferred measure of violence consists of the square of the difference between female and male life expectancies. Even though females are the main victims of domestic violence, such an arithmetic distance in life expectancies seems to make sense as a descriptor of widespread societal violence because males are more likely to be the suppliers and victims of generalized violence. Everything else the same, the distance between female and male life expectancies should increase with the level of violence experienced by a country. One should note, however, that this measure may be very misleading in explaining violence in countries caught in the first stage of the demographic transition, in which female and male life expectancies are comparably low.

The two main contributions of this paper to the literature are, first, to provide econometric support to the hypothesis that violence is a significant deterrent to investment and thus harmful to economic growth and, second, to demonstrate that the arithmetic distance in life expectancies performs better than intentional homicides in explaining the behavior of investment and economic growth. The literature typically uses intentional homicides as a proxy for violence. This statistic is quite useful in studies such as ours in which the dataset is built mostly with country level data from developed and developing countries (see, e.g. Fajnzylber et al., 2002, Soares, 2004). One of its main advantages comes from the fact that it is less likely to suffer from underreporting than other measures of violent criminal activity. But, "life expectancy distance" is likely to be at least as advantageous since it is built from a broader spectrum of factors that affect mortality rates, ranging from natural causes to intentional homicides. Hence, it captures deaths originating from violent behavior but not categorized as intentional homicides (e.g., car fatalities, fatalities following instances of police brutality or related to civil wars, etc.).

¹See, for example, Ehrlich (1973, 1975), Fajnzylber et al. (2002), Levitt (1996, 1997), Mathieson and Passell (1976) and Taylor (1978) for evidence that policing and punishment have significant effects on crime reduction.

2. Data

The dataset used in this study was obtained from four sources:

- (i) Pan American Health Organization / World Health Organization (PAHO/WHO);
- (ii) United Nations' *Human Development Reports*;
- (iii) World Bank's World Development Reports; and
- (iv) International Monetary Fund's publications.

The data enabled us to form an unbalanced panel covering a sample of 115 countries for 35 years, from 1970 to 2004. See Table 1 for a list of countries included in this study.

The variables of interest in this paper are:

- (a) gross fixed capital formation; namely, investment ratio (I);
- (b) annual real GDP growth rate (G);
- (c) intentional homicides per 100,000 people (H);
- (d) life expectancy distance (D), calculated as the square of the difference between female and male life expectancies;
- (e) prime interest rate (P); and
- (f) real domestic interest rate (R).

We also constructed six different dummy variables:

- (1) Latin America and Caribbean – it equals one for all Latin and Caribbean countries except Mexico, and zero otherwise;
- (2) Eastern Europe – it equals one for all Eastern European countries in the sample excluding OECD members, and zero otherwise;
- (3) Asia – it equals one for all Asian countries in the sample except Japan and Korea, and zero otherwise;
- (4) Africa – it equals one for all African countries in the sample, and zero otherwise;
- (5) OECD – it equals one for all OECD countries in the sample, and zero otherwise; and
- (6) Democrats – it equals one for all years in which the United States of America (USA) was governed by democrat presidents, and zero otherwise.

Table 1
Regions and Countries included in our sample

Groups	Countries
Africa	Algeria, Botswana, Burundi, Cape Verde, Egypt, Ethiopia, Lebanon, Liberia, Madagascar, Malawi, Maldives, Mauritius, Morocco, Oman, Papua New Guinea, Rwanda, Senegal, Seychelles, South Africa, Sudan, Swaziland, Tunisia, Zambia, Zimbabwe
Asia	Bahrain, Bangladesh, China, Hong Kong, India, Indonesia, Iran, Iraq, Israel, Jordan, Kuwait, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Qatar, Saudi Arabia, Singapore, Sri Lanka, Syrian Arab Republic, Thailand, United Arab Emirates
Eastern Europe	Albania, Azerbaijan, Bulgaria, Croatia, Cyprus, Estonia, Lithuania, Malta, Romania, Russia, Tajikistan, Ukraine, Former Yugoslavia
OECD	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea Republic, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States
Latin America and Caribbean	Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Vincent and the Gren, Suriname, Trinidad and Tobago, Uruguay, Venezuela

The idea here is that republican governments in the US are more prone to adopt pro-market, pro-economic-expansion, policies. The variable “democrats” is used to reflect this hypothesis.

Table 2 displays key descriptive statistics for investment ratios, annual GDP growth rates, life expectancy distances and intentional homicide rates, the last two statistics being given in logs. Close inspection of the table reveals that when we consider the entire period of analysis:

- (i) Asia presented the highest average growth rate and lowest life expectancy distance while Eastern Europe featured the lowest average growth rate and highest life expectancy distance;
- (ii) there is large variance in investment ratios within each group, except in OECD; and
- (iii) OECD and Latin America and Caribbean presented the lowest and highest average homicide rates, respectively.

Considering five-year life expectancy distance averages for Asia and Eastern Europe, we observe that they were highly constant for the first four periods and then again for the last three periods, indicating that there were significant breaks in trends during the first half of the 1990s. The averages jumped from 1.96 (Asia) and 3.68 (Eastern Europe) to 2.46 and 4.11, respectively. Considering five-year homicide rate averages, we see that OECD and Latin America and Caribbean consistently featured the lowest and highest rates, respectively. For Latin America and Caribbean, the rates have been rising steadily since the second half of the 1970s. Hence, while life expectancy distance suggests that Eastern Europe was the most violent region during the period of analysis, the intentional homicide rate indicates instead that Latin America and Caribbean was the leading region in violence.

Table 3 provides us with information about correlation coefficients. Four important points must be taken into account. First, the annual GDP growth rate is not highly correlated with any of the independent variables. The highest correlation coefficient in the first column is -0.202 (Eastern Europe). Second, the correlation coefficients for the log of life expectancy distance and other independent variables are also very low, including the small positive coefficient, 0.104 , for the correlation with the other proxy for violence, the log of intentional homicide rate. Third, the two highest correlation coefficients in the third column, 0.549 (Latin America and Caribbean) and -0.596 (OECD), are not problematic, but once again inform us that the Latin America and Caribbean and OECD country groupings are the most and least violent ones, respectively, if one uses homicide rates as indicative of violence. Fourth, we note that the correlation coefficient between the prime and domestic interest rates is positive but small (0.010). This result is not surprising, since domestic interest rates tend to follow movements in

Table 2
Descriptive statistics

Year	Variable	Africa	Asia	Eastern Europe	OECD	L.America Caribbean
		Mean(S.D.)	Mean(S.D.)	Mean(S.D.)	Mean(S.D.)	Mean(S.D.)
1970/1974	I	8.99(19.77)	14.45(28.86)	4.34(10.28)	6.70(10.05)	5.80(16.39)
	G	5.57(6.61)	9.75(22.12)	6.72(6.04)	5.2 (2.94)	4.10(5.82)
	Log D	2.01(0.82)	1.91(2.01)	3.38(0.86)	3.60(0.49)	2.77(0.70)
	Log H	0.54(0.42)	1.55(0.88)	0.24(0.92)	0.22(0.83)	1.79(0.76)
1975/1979	I	6.79(23.85)	15.23(24.41)	9.70(15.33)	2.1(8.47)	8.85(26.58)
	G	5.39(11.97)	6.71(7.18)	7.50(6.24)	3.31(3.09)	3.85(6.17)
	Log D	2.13(0.71)	2.12(1.66)	3.58(0.82)	3.68(0.48)	3.03(0.72)
	Log H	-0.01(0.74)	1.20(1.36)	0.52(0.7)	0.35(0.75)	1.47(0.81)
1980/1984	I	4.94(19.20)	5.01(14.03)	2.85(8.44)	-0.09(9.06)	0.50(22.8)
	G	3.85(8.06)	3.53(6.85)	3.58(2.48)	2.01(2.81)	1.46(5.53)
	Log D	2.24(0.69)	1.98(1.94)	3.66(0.73)	3.73(0.39)	3.24(0.71)
	Log H	0.71(1.20)	0.90(1.68)	1.00(0.99)	0.45(0.71)	1.66(0.98)
1985/1989	I	5.49(58.24)	0.48(14.19)	1.43(9.16)	5.18(7.23)	6.52(25.92)
	G	3.87(7.71)	3.53(6.62)	2.90(3.41)	3.37(2.37)	2.72(4.87)
	Log D	2.44(1.22)	1.96(1.92)	3.68(0.54)	3.72(0.39)	3.19(0.67)
	Log H	0.70(0.92)	0.94(1.69)	0.92(0.75)	0.46(0.68)	1.72(0.79)
1990/1994	I	1.38(18.75)	7.84(20.31)	3.05(125.41)	1.14(9.26)	5.00(20.07)
	G	1.57(10.59)	5.18(13.18)	-9.12(10.83)	1.75(3.84)	2.76(4.88)
	Log D	2.49(1.01)	2.46(1.33)	4.11(0.66)	3.72(0.41)	3.22(0.55)
	Log H	0.64(1.22)	1.10(1.68)	1.89(1.18)	0.52(0.74)	2.10(0.85)
1995/1999	I	9.31(22.73)	3.92(23.96)	5.37(23.76)	6.18(8.04)	7.27(21.18)
	G	5.5(10.71)	4.97(8.8)	2.04(6.19)	3.57(2.56)	3.43(3.02)
	Log D	2.42(1.08)	2.40(1.39)	4.17(0.63)	3.63(0.39)	3.51(0.46)
	Log H	2.11(1.73)	1.48(1.4)	2.09(0.87)	0.38(0.72)	2.58(0.71)
2000/2004	I	4.70(18.65)	5.95(12.09)	8.50(13.51)	2.68(6.92)	0.87(13.65)
	G	3.11(5.31)	4.17(5.83)	5.61(3.05)	2.95(2.38)	2.36(3.84)
	Log D	1.81(1.78)	2.54(1.42)	4.06(0.69)	3.51(0.53)	3.47(0.65)
	Log H	1.61(1.61)	1.98(1.73)	1.83(0.87)	0.39(0.72)	2.62(0.77)
1970/2004	I	5.88(29.53)	7.36(20.94)	5.35(59.67)	3.27(8.74)	5.03(21.78)
	G	4.10(9.18)	5.3(11.19)	1.40(8.75)	3.08(3.04)	2.93(5.03)
	Log D	2.26(1.19)	2.25(1.64)	4.00(0.71)	3.65(0.45)	3.29(0.64)
	Log H	0.88(1.35)	1.24(1.54)	1.69(1.08)	0.40(0.74)	1.97(0.91)

the international interest rate and loan offerings in domestic financial markets of developing countries are not close substitutes for loan offerings in international financial markets.

3. Model and Results

We postulate that violence deters investment and the reduction in investment activity lowers economic growth. In order to demonstrate that this is a natural way of explaining how violence affects economic growth, we first consider an econometric specification consisting of two stages; in the first stage, we attempt to explain the behavior of a country's investment ratio with a set of explanatory variables, which includes the country's investment ratio in the past period, prime and domestic interest rates, life expectancy distance and intentional homicide rate – see equation (1):

$$I_{it} = \alpha_0 + \alpha_1 I_{it-1} + \alpha_2 P_{ti} + \alpha_3 R_{it} + \alpha_4 \log D_{it} + \alpha_5 \log H_{it} + \varepsilon_{it} \quad (1)$$

where the subscript it denotes country i at time t . Due to inertia in investment, it is expected that a country's current investment is positively related to its investment in the previous period. Current investment should also be negatively related to international and domestic interest rates, since these rates capture the costs of borrowing in international and domestic financial markets. While investments

Table 3
Correlation matrix (1,043 observations)

Variable	G	Log D	Log H	P	R	Demos	Europe	Africa	Latin	OECD	Asia
G	1.000										
Log D	-0.169	1.000									
Log H	-0.090	0.104	1.000								
P	-0.074	0.012	-0.065	1.000							
R	-0.089	-0.070	0.023	0.010	1.000						
Demos	0.092	0.046	0.103	0.141	-0.038	1.000					
E. Europe	-0.202	0.241	0.159	-0.091	-0.011	0.123	1.000				
Africa	0.056	-0.096	-0.023	0.013	-0.007	0.001	-0.036	1.000			
Latin	-0.026	-0.116	0.549	0.019	0.082	-0.018	-0.127	-0.079	1.000		
OECD	-0.017	0.212	-0.596	0.030	-0.055	-0.046	-0.302	-0.189	-0.662	1.000	
Asia	0.193	-0.330	0.106	-0.012	-0.014	0.005	-0.077	-0.048	-0.170	-0.404	1.000

made by large corporations and foreign investors should be highly influenced by the prime rate, investments made by small and medium enterprises should be largely influenced by domestic interest rates, particularly in developing countries. As for the violence proxies, the hypothesis is that the variables are significant deterrents to investment.

In the second stage, we run a regression consisting of a country's annual growth rate as the dependent variable and a set of explanatory variables, which includes the country's annual growth rate in the past period, its investment ratio and dummies for country groupings and democrat presidential years in the USA – see equation (2):

$$\begin{aligned} G_{it} &= \beta_0 + \beta_1 G_{it-1} + \beta_2 I_{it} + \beta_3 Africa_{it} + \beta_4 EE_{it} + \beta_5 LAC_{it} + \beta_6 OECD_{it} \\ &+ \beta_7 Democrat_t + \mu_{it} \end{aligned} \quad (2)$$

A country's current growth rate should be positively related to both its growth rate in the previous period and its investment ratio. As for the dummies, all of the estimated coefficients should be negative. We expect to obtain negative signs for the coefficients of the country grouping dummies because the country grouping dummy left out is Asia, that is, the country grouping with the highest economic growth rate average, as we pointed out in the previous section. As for the sign of the Democrat dummy, it is hard to tell whether it should be positive or negative, since there were two significant booms during the period of analysis, one under Reagan and another under Clinton.

The econometric results reveal, first, that the coefficients of the violence proxies in equation (1) are negative and statistically significant and, second, that the coefficient of the investment ratio in equation (2) is positive and statistically significant. Therefore, we will establish that violence is a statistically significant hindrance to economic growth, although its harmful effect occurs indirectly through investment deterrence. Given this, we will be in good position to consider a reduced formulation in which the channel which connects violence to economic growth is suppressed and the effect promoted by violence on economic growth is estimated. This is the rationale for the reduced formulation shown in equation (3):

$$\begin{aligned} G_{it} &= \delta_0 + \delta_1 G_{it-1} + \delta_2 \log D_{it} + \delta_3 P_{it} + \delta_4 R_{it} + \delta_5 Africa_{it} + \delta_6 EE_{it} \\ &+ \delta_7 LAC_{it} + \delta_8 OECD_{it} + \delta_9 Democrat_t + v_{it} \end{aligned} \quad (3)$$

For each explanatory variable, the estimated coefficient sign in (3) should be equivalent to the estimated sign we obtain in the two-stage specification.

For each specification type, we run regressions in levels and in differences. While the methodology utilized in levels is GMM, in differences we follow the methodology advanced by Arellano and Bover (1995) and Blundell and Bond

(1998). The latter assumes that there is no autocorrelation in error terms. To be more precise, consider the simple model:

$$y_{it} = \rho y_{it-1} + \beta x'_{it} + \varepsilon_{it} \quad (4)$$

where β is a vector of unknown coefficients, $\varepsilon_{it} = \mu_{it} + v_{it}$ is a random error term, μ_{it} it is an individual specific effect, v_{it} it is not autocorrelated over time and $E[(\mu_{it} + v_{it})x_{it}] = 0$. The structure for the error terms is as follows: $\varepsilon_{it} \sim iid(0, \sigma_\varepsilon^2)$; $v_{it} \sim iid(0, \sigma_v^2)$; $\mu_{it} \sim iid(0, \sigma_\mu^2)$; $E[v_{it}\varepsilon_{it}] = 0$; and $E[v_{it}\mu_{it}] = 0$. The indices $i = 1, \dots, N$ and $t = 1, \dots, T$ indicate the cross-section unit and the time period of the observation, respectively. The vectors of dependent and explanatory variables are denoted y_{it} and x_{it} , respectively. From (4) we obtain:

$$\begin{aligned} y_{it} - y_{it-1} &= \rho(y_{it-1} - y_{it-2}) + \beta(x_{it} - x_{it-1}) + (v_{it} - v_{it-1}) \Rightarrow \Delta y_{it} \\ &= \rho \Delta y_{it-1} + \beta \Delta x_{it} + \Delta v_{it} \end{aligned} \quad (5)$$

for $t = 2, \dots, T$ Equation (5) provides us with the format of the equations to be estimated using the dynamic methodology.

In order to compare the performances of our two violence measures, life expectancy distance and intentional homicide rate are used separately in the regressions in levels and in differences. In Table 4, life expectancy distance is an explanatory variable in models (1) and (3) and intentional homicide rate is an explanatory variable in models (2) and (4). Focusing first on the regressions in levels, we see that life expectancy distance is a statistically significant estimator, but intentional homicide rate is not.² For the regressions in differences, we again find that life expectancy distance outperforms intentional homicide rate in statistical significance, since the margin of error for the former is less than 1% while for the latter it is more than 5%. These results strongly suggest that we should choose life expectancy distance as our measure of violence.

Further inspection of models (1) and (3) reveals that:

- (i) if a country's life expectancy distance rises by 10%, its investment ratio should decrease by 12.8% – see model (1);
- (ii) if the lagged difference in a country's life expectancy distance increases by 10%, its lagged difference in investment ratio should fall by 10.2% – see model (3); and
- (iii) lagged investment ratio and prime and domestic interest rates are all statistically significant estimators.

²In a closely related study, by Fajnzylber et al. (2002), the authors find evidence that GDP growth rate reduces the intentional homicide rate, suggesting, therefore, that homicide rates are countercyclical. Unlike Fajnzylber et al. (2002), we postulate that a country's economic performance is determined in part by its level of violence. Our econometric results seem to support our postulate.

From the first two items, we conclude that violence appears to be a strong deterrent to investment, but its deterrence effect seems to diminish over time.

Models (5) and (6) represent the regressions in levels in the second stage. Model (7) is the regression in differences. In model (5), the estimated coefficients for both lagged growth rate and investment ratio are shown to be positive and statistically significant, as anticipated. These findings are also present in model (6); but, in addition, we observe that Africa, Latin America and Caribbean and OECD country groupings grew significantly less than Asia during the period of study. For example, the growth rate for Asia was on average 150% larger than in Latin America and Caribbean. For the regression in differences, we again see that the estimates for both lagged growth rate and investment ratio are positive and statistically significant. In addition, all dummies are statistically significant. The positive signs for the country grouping dummies indicate that Asia expanded relatively more over time than the other country groups. Finally, the negative sign for Democrats suggests that there is convergence in the overall impacts of Democrat and Republican presidential years on the growth rate of an average country.

Table 4 also provides information about three important tests, namely Sargan, and autoregression orders 1 and 2. The consistency of the GMM estimators depends on whether lagged values of the explanatory variables are valid instruments in explaining investment ratio and GDP growth rate, on whether residual levels are serially uncorrelated and also on whether the explanatory variables are exogenous. The overall validity of the moment conditions is checked by the Sargan test. The results inform us that the validity of the instruments in all models cannot be rejected. The second test of the validity of the estimator examines the hypothesis that error terms are not serially correlated. In this case, the null hypothesis of no second-order serial correlation in first differenced residuals cannot be rejected.

Table 5 displays the econometric results for the reduced equations. As it will become clear, the results for the reduced equations mimic very closely those for the two-stage specification. In model (1), we notice that all estimates are statistically significant. Since investment ratio was seen to be negatively affected by violence (i.e., life expectancy distance) and both types of interest rate, and the growth rate was shown to be positively related to investment ratio, one concludes that growth rate was negatively related to violence and interest rates. Hence, the signs of the estimates in model (1) are consistent with those implied by the two-step procedure. Of particular relevance in this model, a 10% increase in a country's violence should reduce its economic growth rate by 3.6%.

Expanding model (1) in order to include dummies does not change the signs of the estimated coefficients for the original explanatory variables, but it does reduce the absolute value of the violence estimated coefficient. In model (2), a 10% rise in a country's violence should lower its economic growth rate by 2.6%. As for the country grouping dummies, we again see that Asia contributed more to the

Table 4
Econometric results for the two-stage specification

Independent variables	Dependent variable						
	Investment ratio				GDP growth rate		
	GMM (levels)		Arelano-Bond (dynamic)		GMM (levels)		A-B (dynamic)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	9.58* (3.81)	7.12* (4.47)	0.28* (23.51)	0.10* (4.86)	1.19* (3.22)	3.43* (13.04)	-0.05* (-6.90)
Lagged investment ratio	0.22* (8.10)	0.23* (8.33)	0.35* (47.98)	0.30* (516.95)			
Life expectancy distance	- 1.28* (- 2.03)		- 1.02* (- 4.78)				
International homicide rate		- 0.30		- 1.84***	(- 1.81)		
Prime interest rate	- 0.29* (- 2.12)	- 0.50* (- 2.97)	- 0.15* (- 17.16)	- 0.41* (- 30.20)			
Domestic interest rate	- 3×10^{-5} * (- 2.59)	- 3×10^{-5} * (- 2.30)	- 10^{-5} * (- 112.40)	- 10^{-5} * (- 66.95)			
Lagged GDP growth rate					0.58* (5.59)	0.16* (10.13)	0.21* (3.52)
Investment ratio					0.06** (2.00)	0.11* (22.61)	0.05* (22.76)
Africa						- 0.67* (- 2.09)	0.13* (13.69)
Eastern Europe						- 0.59 (- 1.44)	0.68* (32.55)
Latin America and Caribbean						- 1.50* (- 4.85)	0.18* (19.98)
OECD						- 1.28* (- 4.23)	0.84* (12.62)
Democrats						- 0.15 (- 0.54)	- 0.22* (- 54.99)
Number of observations	868	868	957	881	3,650	3,384	3,650
Sargan text <i>p</i> -value	0.25	0.15	0.23	0.17	0.30	0.11	0.47
Autoregression order 1 test			0.0000	0.0000			0.0005
Autoregression order 2 test			0.32	0.44			0.66
Wu-Hausman <i>F</i> test	0.75	0.32			0.29	0.32	

In this table and in the next ones, *t* statistics are given in parentheses.
The significance levels are 10% (***), 5% (**) and 1% (*).

economic growth rate of an average country than did OECD and Latin America and Caribbean. We also observe that, relative to Republican presidential years, Democrat presidential years contributed 41% more to the economic growth rate of an average country.

Finally, since the results for the dynamic regressions and validity tests are qualitatively identical to those displayed in Table 4, they do not merit additional comment.

Table 5
Econometric results for the reduced formulation

Independent variables	Dependent variable: GDP growth rate			
	GMM (levels)		Arelano-Bond (dynamic)	
	(1)	(2)	(3)	(4)
Constant	3.85* (6.82)	4.38* (6.80)	0.04* (22.52)	- 0.23 (- 1.24)
Lagged GDP growth rate	0.48* (13.21)	0.48* (20.64)	0.17* (49.90)	0.11* (4.94)
Life expectancy distance	- 0.36* (- 2.90)	- 0.26* (- 2.07)	- 0.14* (- 2.44)	- 0.46* (- 2.11)
Prime interest rate	- 0.11* (3.52)	- 0.16* (2.98)	- 0.14* (30.70)	- 0.08* (3.66)
Domestic interest rate	- 6.2×10^{-6} * (- 3.01)	- 5.7×10^{-6} * (- 2.53)	- 3×10^{-7} * (- 9.41)	- 1.4×10^{-7} * (0.64)
Africa		- 0.29 (- 0.63)		0.35 (1.41)
Eastern Europe		- 0.81 (- 1.36)		1.90* (2.95)
Latin America and Caribbean		- 0.89* (- 2.37)		0.63* (3.36)
OECD		- 0.80* (- 2.27)		0.40* (2.05)
Democrats		0.41* (2.02)		- 0.25* (- 3.25)
Number of observations	1,136	1,240	940	861
Sargan test <i>p</i> -value	0.11	0.23	0.67	0.19
Autoregression order 1 test			0.0000	0.0001
Autoregression order 2 test			0.25	0.31

4. Conclusion

This paper provides solid empirical evidence that violence, as measured by the distance between female and male life expectancies, is a strong deterrent to investment and thus hinders economic growth. Investment deterrence, however, diminishes over time, perhaps indicating that some investors tend to adapt to violent environments. In addition, we show that the least violent country grouping, Asia, was also the one that featured the highest average annual growth rate during the period of analysis. The average Asian country grew 89% more than the average Latin American and Caribbean country and 80% more than the average OECD country.

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