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Institutions: Key Variable for Economic Development in Latin America

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Abstract

This article examines economic development from 1996 to 2015 for 192 countries and specifically Latin America. Evidence shows that each 0.1-point increase in institutions impacts a 3.9% improvement in Latin American per capita output versus a 2.6% effect on world development. This new evidence from Latin America shows a missing opportunity to develop at higher annual pace than the 2.14% average, mainly due to the deterioration in rule of law. We conjecture the efficiency of monetary/fiscal policies will improve if policymakers emphasize projects that foster improvements to institutional quality, such as transparency, public spending quality and fiscal responsibility.

Keywords: Economic Development; Institutions; Latin America; Panel Data.

JEL Classification: O47; O43; N16.

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1. Introduction

Institutions have been much discussed in the economic literature and are frequently associated with studies on economic development. Rodrik et al. (2004) observe that, together with geography and international trade, institutions are a key determinant of economic development and are part of one of the three main lines of thoughts in the large literature on the wealth of nations. This article examines the effect of institutions on economic development in Latin America, taking into account trade openness, government size, population growth, investment rate, infrastructure, inflation and human capital, which are key factors in economic development studies. We are also interested in establishing how significant the role of institutions is in the empirical model when controlling for domestic credit to the private sector, a measure that is more commonly associated with financial development.

The research design is as follows. First, we run system generalized method of moments (SGMM) dynamic panel data regressions with 192 countries from 1996 to 2015, adopting a model based on Mankiw, Romer and Weil (1992) with domestic investment and population growth rates, focusing on institutions as our variable of interest.[1] Our model includes government size, which involves an important question dealt with by Lizardo and Mollick (2009) about government size and Latin American prosperity. It also controls for openness, which is assumed to be another key variable to development (Rodrik et al., 2004) that has been implemented by Cabral and Mollick's (2012) globalization model with flows of international capital. Next, we adopt infrastructure, proxied by the number of fixed telephone subscriptions

[1] Islam (1995) advocates for the use of the panel data approach to the Mankiw, Romer and Weil (1992) model in order to allow for differences in the aggregate production function across economies.

per 100 people, a variable that measures the cost reduction in the production of intermediate inputs, fostering specialization (Bougheas et al., 2000). Furthermore, our model controls for inflation, a variable that captures the economic instability of an economy and is negatively associated with economic growth (Fischer, 1993). Human capital is another fundamental variable adopted in our equation, since its growth raises labor productivity and other inputs in production, generating a positive impact on economic development (Becker, 1994). We also include financial depth, proxied by domestic credit to the private sector, inspired by Levine's (1997) empirical evidence of financial development as a good predictor of economic growth, to check whether institutions remain statistically relevant in our empirical model. We then adopt a dummy variable for Latin America and check whether the effect of institutions on economic development is stronger in the region than in the rest of the world.

Latin America is a relatively homogeneous group of countries, where Spanish is the main language[2] and Catholicism is the main religion in most of the region, which supports the panel data methodology of providing a single coefficient for the interaction of the panel of countries with the institutions measure. We perform SGMM dynamic panel data regressions to analyze the effect of changes in institutions on the region's economic development in the last twenty years.

Table 1 ranks the nineteen Latin American countries in this study based on the difference between values of institutions measures in the years 1996 and 2015. While those indicators have contrasting performances among countries, the per capita economic growth in the region follows a robust path until 2013. According to the World Development Indicators (WDI)

[2] An exception is the large economy of Brazil, where Portuguese is the official language.

database, displayed in more details in the data section of this paper, the region's per capita GDP grew at an average rate of 2.14% per annum from 1996 to 2015, showing a smaller growth of 0.21% in 2014 and a decline (-1.21%) in 2015. The Worldwide Governance Indicators (WGI) database, in Table 1, shows that countries that have experienced a higher growth in political stability (PV) such as Peru (+0.59), Nicaragua (+0.58), Colombia (+0.54) and Uruguay (+0.46) have better average per capita growth rates (3.4%, 2.6%, 2.3% and 2.7%, respectively).[3] Other institutions measures such as rule of law have deteriorated in countries such as Venezuela (-1.11), Argentina (-0.83) and Ecuador (-0.52), for which the corresponding per capita growth rate shows lower averages in the period (1.2%, 1.6% and 1.8%, respectively).

[Insert Table 1 about here]

The slowest growing countries in per capita terms in our sample (Haiti at -0.2%, Venezuela at 1.2%, Mexico at 1.3%, Guatemala at 1.4%, Honduras at 1.4% and Paraguay at 1.5%) have declined in the equally-weighted average institutions measure over the period, suggesting the positive relationship between institutions and economic development that this paper reports more formally with dynamic panel data models.

This research therefore complements a recent body of empirical work comparing emerging/developing countries to developed countries, which incorporates institutional variables interacting with business cycles (the output gap) into both policy equations of

[3] Although Ecuador has the highest gains in political stability in the period (PV change of +0.77), the per capita growth rate is below the other four listed countries, which may be associated with an overall negative change in the remaining WGI measures for Ecuador, such as: rule of law (-0.52) and regulatory quality (-0.96).

deviations of either nominal interest rates from trend or real government spending, such as Calderón et al. (2016). There is indeed a vast literature on institutions and economic policies, including Acemoglu et al. (2003), Dollar and Kraay (2003), Bravo-Ortega and De Gregorio (2005), Loayza et al. (2005), Zettelmeyer (2006), and Calderón and Fuentes (2012).

Focusing on long term growth, our study reports results for the role of institutions in Latin America economic development which are consistent with this story. In the last two decades, the academic literature on Latin American growth has put much of its attention on the 2000s commodity boom (e.g., Barbier 2004, Bacha & Fishlow 2011), the impact of the global financial crisis on the region (e.g., Ocampo 2009) and public indebtedness (e.g., Reinhart & Rogoff 2010), leaving a gap in regard to the direct impact of institutional quality on the region's (lack of) development. This paper contributes to the economic development literature by providing new evidence that, for a class of models of economic growth, institutions remain a key variable for economic development in Latin America in the last twenty years: ceteris paribus, each 3.9% improvement in per capita output is associated with a 0.1-point increase in institutions, an impact that is 46% stronger than in the rest of the world. While the average per capita economic growth rate in Latin America was around 2.14% per annum, institutions evolved sluggishly across countries, with improvements in some indicators and declines in others. In fact, since institutions did not usually move towards better governance over time, our results suggest that per capita economic growth would have been higher in the region with improvements in governance! Evidence from regressions on rule of law indicates that this missed opportunity is due to the deterioration in the quality of contract enforcement, property rights, police and courts.

The rest of paper proceeds as follows. Section 2 reviews the previous literature on institutions and governance. Section 3 describes the data. Section 4 explains the methodology. Section 5 provides the results, and the last section brings the conclusions.

2. Previous literature

Up to the mid-1990s, most of the literature on institutions and governance was written without proper metrics. Back then, institutions were considered unmeasurable and, later on, there were some misplaced attempts at measurements. Kaufmann (2003) cites an example of bad measurement in which the researcher would use the number of prisoners as a percentage of the population in an attempt of measuring the quality of rule of law. More recently, the challenge has been to focus on rigorous concepts of institutional governance. The World Bank has developed a tool called Worldwide Governance Indicators (WGI), elaborated by Kaufmann, Kraay and Mastruzzi (2009), which covers 215 countries and measures six broad dimensions of governance since 1996, ranging from -2.5 to 2.5: control of corruption (CC), government effectiveness (GE), political stability and absence of violence (PV), regulatory quality (RQ), rule of law (RL), and voice and accountability (VA). Kaufmann et al. explain that the WGI permits significant cross-country analyses and detecting the evolution of governance over time.[4] More recently, Law et al. (2013) use two different institutions datasets – the publicly-available WGI database and the paid database from the International Country Risk Guide (ICRG) – to study the threshold effect of institutional quality on the finance-growth nexus. Although the resulting threshold values differ due to the different scales of those databases, the regression results and

[4] Some authors have pointed out limitations with the WGI measures. Langbein and Knack (2010) sustain, for example, that these measures appear to be evaluating the same broad concept rather than differentiating among aspects of the quality of governance.

even the coefficients that result from the use of these thresholds are about the same, which is a strong indication that the WGI database provides an important measure of institutions.

Empirical studies have previously indicated a strong relationship between institutions and economic development. Mauro (1995) shows that corruption reduces private investment and, consequently, economic growth, even in countries with heavy bureaucratic regulations. Knack and Keefer (1995) provide evidence that lower income levels can be expected in economies in which economic policy decisions and public investment are inefficient and property rights are not protected. La Porta et al. (1999) recognize the critical role of institutions as well as political history for economic performance. Hall and Jones (1999) examine a dataset of 127 countries and show that institutions and government policies determine a country's long-run economic performance. Acemoglu, Johnson and Robinson (2002) argue that the expansion of European overseas empires since the 15th century created an “institutional reversal” among the colonized societies. These interventions encouraged investment in regions that were previously poor. Engerman et al. (2002) discuss that biases in the paths of institutional development explain the long-run persistence of inequality in Latin America and the new world. Their argument is that in those countries where elites were highly segregated (wealth, human capital, and political influence), they would use their privileged position to curb competition. Calderón et al. (2007) show that labor rigidities are negatively linked with long-run growth but only enforceable labor regulations affect economic progress. Wilson (2016) analyzes the provincial-level data from China’s post-Mao reform era and shows positive causal association between growth and governance, arguing that provincial governments are able to employ the potential generated by economic growth to make improvements to governance. D’Agostino et al. (2016) provide

evidence from a panel of 106 countries that the interactions between investment and corruption as well as between military spending and corruption have solid negative effects on economic growth.

Kaufmann et al. (2002) use the WGI measures to show evidence of a strong causal effect from good governance to economic development and, at the same time, little evidence of an impact from higher economic outputs to better governance, refuting the assumption that governance would be a luxury good that increases with wealth accumulation. On the contrary, strong efforts to enhance institutions and governance are necessary even in times of robust economic growth. Other authors, such as Ritzen et al. (2001) and Meisel and Aoudia (2008), use these WGI institutions measures to demonstrate their direct relationships with per capita GDP, income and government performance, and show a very strong cross-country relationship between institutions and income level for 85 countries. Alonso (2011) uses WGI variables in an eclectic model that considers the role of institutional quality, geography, international trade and human capital as determinants of economic growth and confirms the vital role of institutions in long-term development. Tebaldi and Mohan (2010) use eight alternative indicators of institutions, including the six WGI measures, and show that an economy with an effective government, robust control of corruption and stable political system will promote a favorable environment to higher economic growth and lower conflicts of income distribution and poverty. Aixalá and Fabro (2007) show for a large sample of 165 countries that adding institutional measures greatly increases the explanatory power of Mankiw et al.'s (1992) model of economic growth, especially when adopting measures such as Rule of Law, Control of Corruption and Government Effectiveness.

The findings on institutions and economic per capita output make much sense in the light of La Porta et al. (1998), who make a multidisciplinary study on Law and Finance, showing that common law countries – which happen to be, in general, the most developed ones – have the best legal investors protection, whereas French civil law countries possess the lowest levels of investors protection. Easterly and Levine (2003) provide evidence that tropics, germs, and crops impact development through institutions. They also claim having not found any effect of policies on development once they add institutions to their empirical model. Rodrik et al. (2004) claim that institutions are the most important variable in explaining economic development and show that, once institutions are taken into account, trade is often insignificant and geography has no more than a small effect on income.

Since our analysis focuses on Latin America, geography is a common denominator for all countries. Therefore, we cover other variables, such as government size, international trade, investment, inflation, population growth, infrastructure, human capital and financial development variables, which are recurrently utilized in the economic development literature and check to what extent institutions represent an important variable impacting per capita output.

Furthermore, institutions are documented to have an impact on other economic channels impacting growth. Staats and Biglaser (2012) perform a panel data analysis and find that Latin American economies with stronger institutions, such as judicial strength, tend to attract higher levels of FDI. Davis and Hopkins (2011) argue that the key omitted variable in the unresolved research on the effect of inequality on long-run economic growth is the quality of economic institutions. Du et al. (2017) show that, in the presence of solid institutions, foreign banks

improve the banking sector in developing countries. Another example is Blanco (2013), who examines the impact of financial development on Latin American economic growth. Controlling for the moderating impacts of institutions, she finds that financial development has a positive long-run impact on economic growth, although its short-run influence is negative.

The following articles use the WGI database in cross-countries studies and regional analyses. Chen et al. (2015) find a positive effect of corruption on banks' risk-taking behavior, using bank-level data from 35 emerging markets over the 2000-2012 period. Choi et al. (2016) use the Rule of Law variable from the WGI database to study the effects of institutional distance on foreign direct investment. They show that superior general environmental institutions in the host country are positively associated with FDI inflows, while larger minority-investor protection institutions are negatively related to them. Belkhir et al. (2016) use the WGI database to perform a firm-level study on capital structure in the Middle East and North Africa (MENA) region over the period from 2003 to 2011 and find that better institutional quality affects a larger use of debt by firms. Morrissey and Udomkerdmongkol (2012) find that corruption and political instability have great impacts on investment (FDI plus domestic investment) and that FDI inflows crowd out domestic investment. The authors use WGI variables in a sample with 46 developing countries from 1996 to 2009, which has been revised by Farla et al. (2016) with the interaction between governance and foreign investment actually having a negative mediating effect on investment. Fox (2014) utilizes Rule of Law from the WGI database to provide evidence that investments from the colonial era and institutions have impacts on recent slum incidence in sub-Saharan Africa. Zhu and Fu (2013) analyze a cross-country panel dataset from 1992 to 2006 and show evidence that institutional quality, measured by rule of law, facilitates

the export upgrading of countries, also using the government effectiveness and political stability measures as a robustness check. Groh and Wich (2012) use WGI variables to perform a factor analysis that develops a composite index that allows examining the reasons for the concentration of FDI flows in advanced economies. They argue that foreign investors are less attracted by developing and emerging countries because of their inadequate infrastructures and lower quality of legal and political systems.

Finally, these articles cover WGI data in Latin America. Blanco (2009) examines the relationship between economic growth and financial development in Latin America and shows there is a two-way causality between these variables for the economies with better institutions and for the middle income group of countries. Andrews (2010) uses the government effectiveness index from WGI to show that the more effective governments are usually in more developed countries. Alvarez and Urbano (2011) use the WGI measures to demonstrate that institutions such as control of corruption and political stability are often related to entrepreneurial activity in Latin America. Martinez et al. (2013) use WGI variables as control variables to show that inflation, terms of trade, external debt and international reserves are key drivers of sovereign bond spreads in Latin America. Blanco (2012) analyzes 17 Latin American countries from 1986 to 2006 and shows that control of corruption has a significant positive effect on FDI. More recently, Godinez and Liu (2015) have found an asymmetrical impact of corruption on FDI in Latin America: countries with positive corruption distance experience no significant changes in FDI inflow levels while negative corruption distance is associated with considerably lower inward FDI levels.

3. Data

The study sample is an unbalanced panel of 192 economies including 19 countries from Latin America. The collected annual data relates to per capita GDP, institutions, population growth, investment rate, government expenditure, international trade, infrastructure, inflation, human capital and financial depth from 1996 to 2015.[5]

Besides the annual dataset, we also build a dataset with 5-year period averages for all measures for robustness of results.[6] However, although there are 192 countries in the sample, the second-order autocorrelation Arellano-Bond test – AB(2) test – does not return any results because of the small number of time periods: 4 periods of 5 years each. Moreover, the Hansen test results are usually rejecting the null hypothesis of validity of instruments. For this reason, the robustness of results will not be based on comparing results from different samples (annual vs. 5-year average periods), but from different institutions measures in the same annual data sample. In that sense, we provide evidence in the result section of this paper that rule of law (RL) and political stability and absence of violence (PV) are the drivers of the impact of aggregate measure INST on economic development.

The data sources are the Worldwide Governance Indicators (WGI) database from the World Bank, for the institutions measures, and the World Development Indicators (WDI), for all other variables.

[5] The initial year is due to data availability on institutions from the WGI database and the final year is the last available from both WGI and WDI datasets. Since the institutional measures were made available by WGI in a biannual basis until 2002, we calculate the values for the years of 1997, 1999 and 2001 as the average value between the preceding and following years.

[6] Regression results for the sample with 5-year periods are not reported but are available upon request.

[Insert Table 2 about here]

Table 2 describes the six Worldwide Governance Indicators elaborated by Kaufmann, Kraay and Mastruzzi (2009). The six broad dimensions of governance are constructed as a weighted average, using a statistical technique known as unobserved components model (UCM), which assigns more weight to sources that are more correlated and are based on large number of different data sources in the public and private sectors and NGOs.

We build an aggregate institutions measure that consists of an equally-weighted average of these six WGI indices: Control of Corruption (CC), Government Effectiveness (GE), Political Stability and Absence of Violence/Terrorism (PV), Regulatory Quality (RQ), Rule of Law (RL), and Voice and Accountability (VA). This will enable us to use institutions as a broader concept in the empirical model.

Table 3 displays summary statistics for the full sample and the Latin American region (Panel A) and mean values for each Latin America country in the sample (Panel B). The sample period is from 1996 to 2015. In Panel A, we show that per capita GDP (Y/L) is larger for the full sample (US$ 12,082) than for Latin America (US$ 5,790). The Latin American average growth rate over the period (2.14% p.a.) has also been slower than the world average (2.48% p.a.). The averages for the institutional measures in Latin America seem smaller than the world average, except for Voice in Accountability (VA), which is 0.05 points versus the full sample average of -0.03 points.

In Panel B, we analyze the mean values of the variables of each Latin American economy in the sample. The countries with the highest per capita GDP (Y/L) average in the period are Venezuela (US$ 12,740), Chile (US$ 11,529) and Uruguay (US$ 10,356). The country with the smallest Y/L is Haiti (US$ 722) followed by Nicaragua (US$ 1,462) and Honduras (US$ 1,819). In terms of per capita GDP growth rates over the period, the countries with the highest growth rates are Panama (4.29% p.a.) and Dominican Republic (3.90% p.a.), while the ones with lowest rates are Haiti (-0.17% p.a.) and Venezuela (1.20% p.a.).

[Insert Table 3 about here]

The institutional measures range from –2.5 to 2.5 points. Among the six variables, Chile has the strongest performance on four of them: control of corruption (1.44), government effectiveness (1.20), regulatory quality (1.47) and rule of law (1.26). Uruguay has the highest political stability (0.79), followed by Costa Rica (0.68) and Chile (0.51). Costa Rica has the highest voice and accountability (1.03). Four of the lowest scores on institutional variables are detained by Haiti: control of corruption (-1.33), government effectiveness (-1.52), rule of law (-1.52), and voice and accountability (-0.90). Colombia has the lowest political stability and absence of violence (-1.68), followed by Haiti (-1.11). Venezuela has the lowest regulatory quality (-1.07), followed by Haiti (-1.00).

The aggregate variable for institutions (*INST*), an average of the six institutions indices, shows the highest values for Chile (1.14), Uruguay (0.73) and Costa Rica (0.61), while Haiti (-1.23), Venezuela (-1.02), Paraguay (-0.77) and Ecuador (-0.68) score the lowest values.

The annual rate of population growth in Uruguay (0.29%) is the lowest, followed by El Salvador at 0.56% per annum. Guatemala and Honduras have the highest population growth rate (2.25% p.a.) in the sample. The investment-to-output ratios (I/Y) of each country remain at similar levels from the previous decades (1980s and 1990s). However, large economies as Brazil and Mexico experienced a decline in those ratios, possibly because investment did not keep up with the pace of the sharp rise in those countries' economic growth in the 2000s. Panama (36.56%), Haiti (28.12%), Honduras (27.50%) and Nicaragua (27.42%) have the highest investment rates, while El Salvador (15.48%), Guatemala (16.83%) and Paraguay (16.96%) display the lowest ones.

Regarding international trade, Brazil and Argentina are the economies with the lowest trade openness (24% and 32%, respectively), which is calculated as the total trade (exports plus imports) over GDP. Panama has the highest trade openness (137%), followed by Honduras (117%). In terms of government size, Brazil has the largest government expenditure-to-GDP ratio (19%) while Haiti has the smallest one (7%). For the infrastructure measure, we adopt the number of fixed telephone subscriptions per 100 people as proxy. Uruguay is the country with the highest percentage (28.33%) while bottom country is Haiti with only 0.91%. The inflation levels are often used as proxy for the monetary instability of a country.[7] In Latin America,

[7] An anonymous referee suggested deviations of inflation from a threshold level. Since not all countries adopt inflation targeting, which means that targets may vary across countries (and over time), we adopt inflation itself as a proxy for monetary instability and expect a negative impact of inflation on per capita GDP, although we

Venezuela has the highest mean levels of inflation (35.40% p.a.) while Panama is the economy with a lowest (2.51% p.a.) average levels. In regard to human capital, we adopt the human capital index based on Feenstra et al. (2015), which considers both the average years of schooling from Barro and Lee (2013) and an assumed rate of return to education based on Mincer equation estimates around the world (Psacharopoulos, 1994). Chile shows the highest level of the human capital index (2.88) for Latin America, while Haiti is the last country in that list (1.56).

With respect to the *financial depth* variable, Panama has the highest banking penetration (83.35%), measured by domestic bank credit to the private sector (as percentage of GDP), followed closely by Chile (83.10%), while Haiti (15.47%) and Argentina (15.91%) have the lowest ratios.

[Insert Table 4 about here]

Table 4 shows the correlation coefficients between the series. Panel A reports correlation coefficients for variables in the empirical model. Panel B reports correlations coefficients for all individual institutions measures and the aggregate variable INST. In Panel A, there is a strong correlation between per capita GDP (Y/L, the dependent variable in the empirical model, as shown in the subsequent section of this paper) and the following measures: INST (+0.80),

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acknowledge recent literature findings that the negative effects begin after some threshold has been reached (López-Villavicencio and Mignon, 2011).

human capital (+0.78), infrastructure (+0.88) and financial depth (+0.70). The milder correlation coefficients between Y/L and other measures are all consistent with expected signs from the development literature: Y/L growth rate (-0.05), population growth (-0.26), investment rate (+0.18), government size (+0.30), trade openness (+0.27) and inflation (-0.33).

Most of the remaining correlation coefficients in Panel A are small, but there is a high correlation between human capital and infrastructure (0.83) and a few medium to high correlations between institutions and human capital (0.70), between institutions and infrastructure (0.76), and between institutions and financial depth (0.74). Financial depth has other medium to high correlations with human capital (0.63) and infrastructure (0.71). There are also some medium correlations between institutions and inflation (-0.40), between human capital and population growth (-0.49) and between infrastructure and population growth (-0.46). Panel B shows high coefficients for the correlations among the six institutions measures.

4. Methodology

In this section, we describe the empirical model and provide the expected coefficient signs based on theory and evidence from previous literature. The empirical model below is estimated by SGMM dynamic panel data regressions. We construct a model that takes into account Mankiw et al.'s (1992) empirical approach to the Solow (1956) growth model. From that literature, we adopt the variables investment-to-output rate, population growth and human

capital.[8] In addition, we add government size (Lizardo and Mollick, 2009; Cabral and Mollick, 2012) and trade openness (Rodrik, 1998; Alesina and Wacziarg, 1998; Cabral and Mollick, 2012; Benarroch and Pandey, 2012). Infrastructure is another key variable, as highlighted in Barro (1990) and Bougheas et al. (2000). Given the instability in Latin American region, we also control for inflation (Fischer, 1993). Lastly, we add financial depth to the model as in Levine (1997).

For our variable of interest, institutions, we develop an aggregate index that is calculated by an equally-weighted average of the set of six worldwide governance indicators developed by Kaufmann et al. (2009). With the following model, we analyze the relevance of improvements in institutions to economic development in Latin America:

$$\ln(y_{it}) = \alpha_i + \gamma\ln(y_{it-1}) + \beta_1 INST_{it} + \beta_2 INST_{it} * LATAM_i + \beta_3 n_{it} + \beta_4\ln(s_{it}) + \beta_5\ln(G_{it}) + \beta_6\ln(TO_{it}) + \beta_7\ln(Infra_{it}) + \beta_8\ln(Inflation_{it}) + \beta_9\ln(HC_{it}) + \beta_{10}\ln(Fin\_Depth_{it}) + \varepsilon_{it} \quad (1)$$

where $\ln(y_{it})$ represents the natural log of per capita GDP in constant 2010 US$ prices in country *i* at time *t*, and α_i corresponds to the country's unobserved heterogeneity term. We adopt the lagged dependent variable $\ln(y_{it-1})$ in the right-hand-side of the equation as usual for a SGMM model specification.

The variable $INST_{it}$ corresponds to the aggregate institutional variable, calculated by an equally-weighted average of the six WGI indicators, which vary from -2.5 to +2.5. We measure how much a unit change in that variable relates to a percent change in the dependent variable per capita output. LATAM is a binary variable equal to one if a country is from Latin America;

[8] Lucas (1988) and Becker (1994) also show supportive evidence for the crucial role of human capital in economic development.

otherwise zero. We adopt this measure to check for the coefficient for the interaction term $INST_{it}$ x $LATAM_i$, which represents the additional impact of INST on economic development in the Latin American region.

The variable n_{it} is the rate of population growth, $\Delta\ln(s_{it})$ is the natural log of investment-to-output ratio, $\ln(G_{it})$ is the natural log of government size, $\ln(TO_{it})$ is the natural log of trade openness, $\ln(Infra_{it})$ is the natural log of the number of fixed telephone subscriptions per 100 people, $\ln(Inflation_{it})$ is the annual inflation rate of consumer prices, $\ln(HC_{it})$ is the human capital index, $\ln(Fin\_Depth_{it})$ is the domestic credit to the private sector as percentage of GDP and ε_{it} is the stochastic error term.[9] We assume reverse causation from per capita GDP to investment rate (which is part of GDP according to the expenditure approach), in order to address potential endogeneity in our model, and adopt INST as the exogenous variable in the System GMM regression specification. Institutions represent the regulatory framework and most of this comes from liberty of press, political systems, etc., which have their own dynamics and structure. Specification tests will be employed to verify the validity of instruments.

We expect the sign of β_1 to be positive, in line with Hall and Jones (1999), Acemoglu, Johnson and Robinson (2002) and Kaufmann and Kraay (2003), who show a direct relationship between institutional quality and economic development across countries. The sign of β_2, however, will

[9] Previous versions of this paper had fixed-effect regressions for a sample of only Latin American countries. The main results on the β-coefficients are similar to the ones reported below with one important difference: the coefficient on I/Y appeared statistically significant and close to 0.20, which is near to the sample mean of I/Y for these countries as reported in Table 3 (22.17%). Since I/Y loses statistical significance in the tables reported below corresponding to (1), this suggests that the likely cause of the endogeneity in (1) when we adopt fixed-effects regressions is a reverse causation from changes in per capita output to changes in the investment-to-output ratio, an assumption that we adopt in the current version with SGMM regressions. Full tables with fixed-effects regression results for Latin America are available upon request.

depend on whether Latin American economies show a stronger or weaker effect of institutions on per capita GDP than the world average.

Consistent with the Mankiw et al. (1992) model, we expect the impact of population growth on per capita GDP output (β_3) to be negative and the investment rate coefficient (β_4) to have a positive impact on economic development. The sign of β_5 will depend on whether government spending complements private investment or government size crowds out private sector activities and contributes to lower economic growth. Rodrik (1998) reports a positive sign but Lizardo and Mollick (2009) document a negative relationship for Latin American economies. For trade openness, we expect a positive β_6 based on trade generating more productivity gains in the economy, which matches Cabral and Mollick (2012). For infrastructure, a positive β_7 is expected, in line with Barro (1990) and Bougheas et al. (2000). As in Fischer (1993), we expect inflation (β_8) to be negatively related to economic development. From Mankiw et al. (1992) and more recent seminal papers from Lucas (1988) and Becker (1994), we hypothesize a positive coefficient β_9 for human capital. Lastly, financial depth should have a positive impact (β_{10}) on per capita GDP as in Levine (1997).

5. Results

5.1 Bivariate Regressions

Figure 1 presents bivariate regressions for the Latin America region. The first scatter plot shows the regression of log per capita GDP on aggregate institutions ($INST$). The dependent variable displays a strong positive association with institutions, with an R^2 of 35.95%. There is a negative association between population growth and log of per capita GDP, with an R^2 of 14.74%. The

relationship between the investment-to-output ratio and log per capita output growth is positive with an R^2 of 12.56%.

[Insert Figure 1 about here]

However, we only find this result after we remove the observations from Haiti, Honduras and Nicaragua, which are clearly outliers in the plot. Moreover, there is a positive association between government size and log of per capita GDP with an R^2 of 21.74%. The curve of trade openness versus log of per capita GDP shows a negative link between them with an R^2 of 8.64%. This negative association may be a static result that does not take into account the dynamics of international trade over time. For example, Brazil and Argentina have the lowest trade openness sample means (24% and 32%, respectively) in the region, but those levels have increased around 10 percentage points since the 1990s decade. Infrastructure and human capital have both very strong positive relationships with the dependent variable, with R^2 of 75.42% and 48.42%, respectively. Inflation displays a negative relationship with lop of per capita GDP, after we remove a clear outlier from Venezuela, with an R^2 of 5.60%. Lastly, the association between the dependent variable and financial depth is positive and displays an R^2 of 4.87%. These findings are subject, however, to bias due to endogeneity and "omitted variables", among others.

5.2 Dynamic Panel Data Regressions

Tables 5-7 display results from the SGMM dynamic panel data regressions using the aggregate and individual institutions measures. In all cases the estimations pass the Arellano-Bond test of second-order serial correlation and the Hansen's validity of instruments test.

[Insert Table 5 about here]

In Table 5, the SGMM regressions confirm a positive and highly significant effect of the aggregate institutions measure on the log of per capita GDP, especially in Latin America. The level of significance of β_1 is 5% or better in 12 out of 13 regressions, while β_2 is significant at the 5% level in all three regressions adopting the interaction term INST x LATAM. The coefficients for β_1 range from 0.205 to 0.373, indicating that a change of one point in the aggregate variable *INST* is associated with an annual increase between 20.5% and 37.3% in the world's per capita GDP. It is important to note that annual changes in INST are usually smaller than 0.1 point, therefore the large coefficients are consistent with the notion that a change of a 0.1-point change in the aggregate institutional measure has an impact of around 2.1% to 3.7% (averaging 2.64%) on the world development, ceteris paribus.[10] For Latin America, the marginal effect captured by β_2 corresponds to an additional impact of around 1.04% to 1.44% (averaging 1.22%) of aggregate institutions on per capita GDP. In sum, each 0.1-point increase in institutions impacts an average improvement of 3.86% (= 2.64% + 1.22%) in Latin American per capita output, an impact 46% (= 1.22 divided by 2.64) stronger for the region than for the rest of the world.

[10] In this sample, annual changes in INST are inside of the [-0.10, +0.10] interval in 90.4% of the observations, and inside of the [-0.20, +0.20] interval in 99.4% of the observations.

The positive relationship between institutions and Latin American per capita GDP are consistent with Hall and Jones (1999), Acemoglu, Johnson and Robinson (2002), Kaufmann and Kraay (2003) and Rodrik et al. (2004). Rodrik et al. perform cross-sectional OLS regressions of log per capita GDP on rule of law and find coefficients equal to 1.78 using the Acemoglu et al. sample of 64 countries, 1.98 using an extension of Acemoglu et al. sample with 79 countries (baseline model) and 1.30 using a large sample with 137 countries. However, we need to be careful when comparing results, since Rodrik et al. (2004) use cross-sectional OLS regressions (in the year 1995) that measure a static relationship between variables. Our dynamic panel data regressions measure the relationship between changes in institutions and in the per capita GDP, taking into account country-specific fixed effects.

The next step is to run SGMM regressions alternating the six WGI variables to represent institutions in the model. Rule of Law (RL) and Political Stability/Absence of Violence (PV) are the institutions with larger number of significant coefficients across different regression specifications.[11]

Table 6 displays the results from the SGMM dynamic panel data regressions that use Rule of Law (RL) as the institutions variable. The regressions confirm a rule of law coefficient between 0.166 and 0.424. There is a very strong positive effect of rule of law on the log of per capita GDP in most of the specifications: the β_1 coefficient is significant at the 1% level in 11 out of 13 regressions. The coefficient β_2 captures the interaction RL x LATAM: it is positive in the

[11] Remaining tables are available upon request. Control of Corruption (CC) has 1 significant coefficient to the 5% level and 2 coefficients that are significant to the 10% level out of 5 different regressions. Regulatory Quality (RQ) has only 1 significant coefficient out of 5 regressions. Government Effectiveness (GE) and Voice and Accountability (VA) do not have any significant coefficients out of 5 regressions.

specifications where it is employed and is also significant at the 1% level. This means that Latin American countries with growing rule of law scores improve their per capita GDP, while countries with decreasing rule of law scores deteriorate their levels of economic development. The similarity between the coefficients for Rule of Law (RL) and its interaction with LATAM in tables 6 with the ones from table 5 is consistent with Rule of Law being the institutions measure that "drives" the impact of institutions on per capita GDP. The ratio between β_2 and β_1 in table 6 is almost identical to the one in table 5: the impact of Rule of Law on Latin American economic development is 44% (= 10.5 divided by 23.6) larger than its effect on the rest of the world.

[Insert Table 6 about here]

Table 7 shows the SGMM regression results with Political Stability and Absence of Violence (PV) as the institutions measure. PV displays ten significant coefficients (out of 13) between 0.0596 and 0.129, confirming the positive impact of political stability on Latin American per capita GDP. These β_1 coefficients are significant at the 1% level in 7 out of 13 regressions and at the 5% level in 2 regressions. Evidence is that political stability directly influences output in Latin American countries, in line with Tebaldi and Mohan's (2010) finding on 53 countries around the world. In our paper, the impact of PV on Latin per capita GDP averages 1.6% for each 0.1-point increase in its index, ceteris paribus, as compared to an effect of 0.83% for the rest of the world. This is a smaller impact than the one from Rule of Law, but it is noticeable that the interaction term PV x LATAM doubles the effect in Latin America, a region where most countries experienced an improvement in political stability in the last 20 years as previously described in Table 1 (main exceptions are Venezuela, Bolivia, Argentina and Ecuador).

Finally, we briefly analyze results from control variables. Investment-to-output ratio, trade openness, infrastructure, human capital and financial depth are positively related to Latin American development, with trade openness and financial depth always statistically significant. Population growth, government size and inflation rate show negative coefficients, consistent with current literature.

[Insert Table 7 about here]

Among the control variables, it is therefore worth observing the coefficients of population growth ratio, government size, trade openness, inflation and financial depth. In Table 5, there are 6 out of 13 population growth rate coefficients significant at least at the 5% level, ranging from -0.022 to -0.029. The interpretation is that each percentage-point change in the population growth rate is associated with a decrease of about 2.2 to 2.9 percent in the per capita GDP and adds evidence to the strong relationship observed in Mankiw et al. (1992). The significant government size coefficients range from -0.053 to -0.120 and are evidence that increasing expenditures as percentage of Latin American countries' GDP are detrimental to economic development, consistent with Lizardo and Mollick (2009) and Blanco (2013). Trade openness is significant at the 1% level in 11 out of 11 regressions in table 5 and its coefficients vary between 0.088 and 0.187, providing evidence in line with Rodrik (1998), Alesina and Wacziarg (1998), Cabral and Mollick (2012), and Benarroch and Pandey (2012). Inflation has a negative and significant coefficient in 6 out of 7 regressions in table 5, in line with Fischer (1993). Finally, financial depth coefficients are significant to the 1% level in 3 out of 4 regression

specifications, ranging from 0.385 to 0.684, indicating that each 1-percent increase in the domestic credit to the private sector would be associated with an increase of around 5.2 percent in the per capita GDP.

6. Concluding remarks

This article analyses institutions and their effects on economic development in Latin America. In the period from 1996 to 2015, the evidence in this paper confirms that institutions matter to the region's economies and that this relationship is highly significant. An increase of 0.1 point in the aggregate institutions measure (*INST*) is associated to an average improvement of 3.9% in the per capita GDP. Although institutions measures usually do not change abruptly from one year to another, they have the potential to strongly impact either positively (e.g., increases in political stability in Peru, Colombia and Uruguay) or negatively (e.g., decreases in rule of law in Venezuela and Bolivia) the economic growth rate in Latin America over the years.

The positive impact of institutions on Latin American per capita GDP is consistent with Hall and Jones (1999), Acemoglu, Johnson and Robinson (2002), Kaufmann and Kraay (2003) and Rodrik et al. (2004). However, comparing results should be taken with care, since Rodrik et al. (2004) use cross-sectional OLS regressions in the year 1995, which measure a static relationship between variables. Our SGMM panel data regression measures the dynamic relationship between institutions and per capita GDP, taking into account country-specific fixed effects.

The aggregate institutions measure (*INST*) captures the movements of all six WGI indices. Evidence shows that its statistical significance is higher than most of the individual institutions measures and in a larger number of regressions. Rule of law is the only measure that shows a

larger number of significant coefficients at the 1% level (11 out of 13 regressions) than does the equivalent regression using the aggregate institutions measure (6 out of 13 regressions). This result suggests that the quality of contract enforcement, property rights, police and courts play a crucial role in Latin American economic development. While there are increases in the significance of institutions when inserting rule of law to the model, the coefficients, however, are remarkably similar (positive and statistically significant) and the effects of the controls are preserved in all cases, which support very stable results across models. Additionally, results show that changes in political stability directly influence output in Latin America, in line with Tebaldi and Mohan (2010) study on 53 countries around the world.

This paper reports new results when Latin American average economic growth per capita was close to 2.14% per annum and institutions evolved sluggishly across countries. Since institutions did not usually move towards better governance over time, our results suggest that per capita economic growth would have been higher in the region with improvements in governance!

Important public policy implications arise from our results. First, the finding that strong institutions significantly facilitate economic progress suggests that policy makers should put forward actions that bring advances to institutions in order to boost development. Second, if there is clear evidence that small and frequent changes in institutions significantly impact economic growth, an important share of these policy measures should involve projects that implicate frequent improvements to the quality of institutions. In that sense, recent papers indicate that countries are able to change their policies despite financial imperfections and political-economy conditions and demonstrate that good institutions are associated with – but not limited to – high transparency, public spending quality and fiscal responsibility (Andreula

and Chong, 2016; De la Maisonneuve et al., 2016; Calderón et al., 2016). Future studies could extend the work to different regions of the world, which should enable comparative analyses in a global perspective. Studies focusing on the dynamics of Latin American economies could further investigate rule of law and political stability effects on per capita GDP, especially with their interaction with financial markets.

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Table 1: Change in institutions measures, per country, between 1996 and 2015.

Country	INST
Colombia	0.41
El Salvador	0.33
Uruguay	0.21
Panama	0.19
Paraguay	0.13
Honduras	0.11
Peru	0.08
Guatemala	0.06
Mexico	0.03
Dominican Republic	0.01
Costa Rica	0.00
Chile	-0.05
Nicaragua	-0.05
Haiti	-0.06
Ecuador	-0.07
Brazil	-0.12
Bolivia	-0.39
Argentina	-0.53
Venezuela	-0.83

Country	RL
Colombia	0.59
Haiti	0.51
El Salvador	0.31
Mexico	0.30
Chile	0.28
Uruguay	0.22
Guatemala	0.19
Panama	0.15
Brazil	0.14
Peru	0.12
Paraguay	0.10
Dominican Republic	0.04
Honduras	-0.01
Costa Rica	-0.04
Nicaragua	-0.11
Ecuador	-0.52
Argentina	-0.83
Bolivia	-0.84
Venezuela	-1.11

Country	PV
Ecuador	0.77
Peru	0.59
Nicaragua	0.58
Paraguay	0.56
Colombia	0.54
Uruguay	0.46
Guatemala	0.43
Panama	0.36
Dominican Republic	0.31
El Salvador	0.25
Haiti	0.16
Mexico	0.09
Honduras	0.06
Bolivia	-0.04
Argentina	-0.09
Costa Rica	-0.11
Brazil	-0.13
Chile	-0.22
Venezuela	-0.39

Country	RQ
Colombia	0.37
El Salvador	0.19
Dominican Republic	0.18
Honduras	0.18
Paraguay	0.12
Mexico	0.01
Guatemala	0.00
Nicaragua	-0.07
Haiti	-0.11
Panama	-0.16
Costa Rica	-0.19
Peru	-0.20
Chile	-0.29
Uruguay	-0.40
Brazil	-0.62
Ecuador	-0.96
Bolivia	-1.12
Argentina	-1.58
Venezuela	-1.68

Country	CC
Uruguay	0.58
Honduras	0.47
El Salvador	0.47
Ecuador	0.25
Bolivia	0.22
Colombia	0.20
Costa Rica	0.13
Guatemala	0.11
Panama	0.00
Paraguay	-0.08
Haiti	-0.15
Chile	-0.19
Mexico	-0.30
Brazil	-0.36
Argentina	-0.37
Nicaragua	-0.39
Venezuela	-0.42
Peru	-0.43
Dominican Republic	-0.67

Country	GE
El Salvador	0.48
Panama	0.27
Ecuador	0.19
Colombia	0.16
Mexico	0.14
Costa Rica	0.12
Honduras	0.04
Uruguay	0.04
Dominican Republic	0.02
Nicaragua	0.01
Paraguay	0.00
Brazil	-0.04
Chile	-0.20
Guatemala	-0.21
Peru	-0.23
Argentina	-0.35
Bolivia	-0.47
Venezuela	-0.50
Haiti	-0.79

Country	VA
Peru	0.67
Colombia	0.58
Panama	0.50
Uruguay	0.36
Chile	0.33
Brazil	0.30
El Salvador	0.29
Dominican Republic	0.17
Costa Rica	0.09
Paraguay	0.07
Argentina	0.04
Haiti	0.00
Mexico	-0.04
Bolivia	-0.08
Honduras	-0.10
Guatemala	-0.13
Ecuador	-0.14
Nicaragua	-0.34
Venezuela	-0.87

Notes: This table ranks the 19 Latin American countries in this study based on the difference between the values of each institutions measure in the years 1996 and 2015. INST is an aggregate institutions measure that is calculated as an equally-weighted average of six institutional variables: Control of Corruption (CC), Government Effectiveness (GE), Political Stability and Absence of Violence/Terrorism (PV), Regulatory Quality (RQ), Rule of Law (RL), and Voice and Accountability (VA), which range from -2.5 to +2.5, according to the Worldwide Governance Indicators (WGI) database guidelines.

Table 2: Definitions of the institutions' measures.

Variable name	Description
Control of Corruption (CC)	Perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.
Government Effectiveness (GE)	Perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
Political Stability and Absence of Violence/Terrorism (PV)	Perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism.
Regulatory Quality (RQ)	Perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
Rule of Law (RL)	Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
Voice and Accountability (VA)	Perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.

Source: Worldwide Governance Indicators (WGI).

Table 3: Summary Statistics

Panel A: Full sample vs. Latin America

	Full sample					Latin America				
Variable	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Per capita real GDP (Y/L)	3,752	12,082	17,848	123	111,968	378	5,790	3,747	662	14,907
Y/L growth rate	3,561	2.48	5.75	-62.23	140.50	359	2.14	3.42	-11.88	16.23
Institutions (INST)	3,824	-0.04	0.89	-2.23	1.99	380	-0.26	0.59	-1.62	1.25
Control of Corruption (CC)	3,793	-0.04	0.99	-2.06	2.59	380	-0.36	0.70	-1.82	1.57
Gov. Effectiveness (GE)	3,787	-0.03	0.98	-2.32	2.43	380	-0.29	0.62	-2.03	1.29
Political Stability (PV)	3,767	-0.07	0.98	-3.18	1.66	380	-0.37	0.66	-2.39	1.00
Regulatory Quality (RQ)	3,786	-0.02	0.97	-2.68	2.26	380	-0.05	0.66	-1.86	1.64
Rule of law (RL)	3,815	-0.05	0.98	-2.23	2.12	380	-0.52	0.69	-1.99	1.42
Voice and Accountability (VA)	3,823	-0.03	0.97	-2.22	1.83	380	0.05	0.55	-1.37	1.24
Population growth (n)	3,644	1.53	1.59	-10.38	17.74	361	1.44	0.52	-0.06	2.74
Investment rate (I/Y)	3,418	23.88	10.63	-2.42	219.07	358	22.17	6.18	11.02	47.05
Government size (G/Y)	3,439	16.16	8.12	2.05	156.53	378	12.16	3.40	4.79	22.73
Trade openness (TO)	3,581	89.69	52.92	0.03	531.74	378	65.22	29.30	15.64	165.34
Infrastructure (Infra)	3,750	18.75	19.02	0.00	110.19	380	13.35	7.75	0.05	32.59
Inflation	3,404	17.20	425.62	-35.84	24,411	376	9.17	11.83	-1.17	109.68
Human Capital (HC)	2,679	2.42	0.69	1.05	3.73	361	2.34	0.38	1.44	3.05
Financial depth	3,476	46.59	42.93	0.00	312.12	378	35.33	21.06	8.77	109.88

Panel B: Mean values for each Latin American country.

Country	Per capita real GDP (Y/L)	Y/L growth rate	Institutions (INST)	Control of Corruption (CC)	Government Effectiveness (GE)	Political Stability and Absence of Violence (PV)	Regulatory Quality (RQ)	Rule of Law (RL)	Voice and Accountability (VA)	Population Growth (n)	Investment rate (I/Y)	Trade openness (TO)	Government Size (G/Y)	Infra-Structure (Infra)	Inflation	Human Capital (HC)	Financial depth (Fin_Depth)
Argentina	9,083	1.64	-0.21	-0.41	-0.04	-0.13	-0.45	-0.54	0.28	1.08	17.39	31.74	14.02	22.47	7.07	2.77	15.91
Bolivia	1,839	2.36	-0.45	-0.59	-0.42	-0.50	-0.42	-0.74	-0.01	1.75	17.19	64.67	14.74	6.99	5.50	2.60	48.26
Brazil	9,975	1.49	0.00	-0.07	-0.07	-0.12	0.17	-0.27	0.36	1.18	19.03	24.03	19.20	19.33	6.91	2.28	42.97
Chile	11,529	3.04	1.14	1.44	1.20	0.51	1.47	1.26	0.96	1.07	23.44	65.43	11.66	20.01	3.68	2.88	83.10
Colombia	5,708	2.30	-0.48	-0.31	-0.14	-1.68	0.18	-0.61	-0.31	1.26	21.04	36.12	17.40	16.42	7.51	2.27	36.32
Costa Rica	7,339	2.80	0.61	0.60	0.30	0.68	0.55	0.52	1.03	1.54	n/a	79.77	14.80	24.22	9.35	2.50	36.54
Dominican Rep.	4,662	3.90	-0.32	-0.63	-0.51	-0.09	-0.19	-0.61	0.07	1.44	22.06	67.89	8.34	10.08	9.14	2.31	24.92
Ecuador	4,395	1.83	-0.68	-0.84	-0.71	-0.62	-0.78	-0.90	-0.25	1.72	23.80	54.29	11.74	12.00	17.25	2.57	22.99
El Salvador	3,299	1.65	-0.20	-0.46	-0.30	0.01	0.20	-0.68	0.02	0.56	15.48	68.26	10.27	13.32	3.41	1.95	42.00
Guatemala	2,709	1.37	-0.60	-0.65	-0.59	-0.81	-0.16	-1.07	-0.34	2.25	16.83	58.41	8.73	8.64	6.32	1.69	25.41
Haiti	722	-0.17	-1.23	-1.33	-1.52	-1.11	-1.00	-1.52	-0.90	1.57	28.12	57.21	7.16	0.91	12.65	1.56	15.47
Honduras	1,819	1.44	-0.58	-0.85	-0.65	-0.41	-0.32	-0.95	-0.32	2.25	27.50	116.75	14.63	6.77	9.14	1.99	43.12
Mexico	8,798	1.27	-0.13	-0.36	0.22	-0.56	0.36	-0.52	0.11	1.45	22.01	56.71	11.51	14.77	8.09	2.51	20.84
Nicaragua	1,462	2.57	-0.51	-0.71	-0.79	-0.30	-0.30	-0.74	-0.25	1.37	27.42	80.59	8.07	4.04	8.49	1.99	24.54
Panama	6,995	4.29	0.11	-0.32	0.16	0.06	0.45	-0.16	0.48	1.86	36.56	136.62	12.79	13.96	2.51	2.67	83.35
Paraguay	3,009	1.54	-0.77	-1.11	-0.95	-0.74	-0.54	-0.96	-0.30	1.64	16.96	96.09	10.37	5.39	7.25	2.26	29.40
Peru	4,262	3.38	-0.30	-0.32	-0.25	-0.89	0.40	-0.64	-0.09	1.32	21.61	44.00	11.20	8.63	3.75	2.66	25.51
Uruguay	10,356	2.74	0.73	1.02	0.50	0.79	0.50	0.56	1.00	0.29	18.26	48.77	12.29	28.33	9.97	2.55	32.19
Venezuela	12,740	1.20	-1.02	-1.03	-1.00	-1.05	-1.07	-1.35	-0.62	1.69	24.62	50.28	12.05	17.38	35.40	2.36	16.65

Notes: Panel A reports the summary statistics of the variables from 1996 to 2015 (20 years) for the full samples and the Latin American region as a whole. Panel B reports the mean values from 1996 to 2015 for each of the 19 Latin American countries in the sample. "n/a" means not available at the source database. The variable Y/L corresponds to the per capita GDP in constant 2010 US$ prices. Y/L growth rate is calculated as follows: $[(Y/L_t - Y/L_{t-1}) / Y/L_{t-1}]$. INST is an equally-weighted average of six institutional variables: Control of Corruption (CC), Government Effectiveness (GE), Political Stability and Absence of Violence/Terrorism (PV), Regulatory Quality (RQ), Rule of Law (RL), and Voice and Accountability (VA), which range from -2.5 to +2.5, according to the Worldwide Governance Indicators (WGI) database guidelines. The variable n is the rate of population growth ($\Delta L_{it}/L_{it-1}$) x 100. I/Y is the investment-to-output ratio (s_{it}) x 100. G/Y corresponds to government size (expenditure-to-GDP ratio) x 100. TO is the trade openness variable (total trade over GDP) x 100. Infra is the infrastructure variable proxied by number of fixed telephone subscriptions per 100 people. Inflation is the annual percent change in consumer prices. HC is the human capital variable, for which we adopt the human capital index from Penn World Table 9.0 as in Feenstra et al. (2015). Financial depth is proxied by domestic credit to private sector as percent of GDP x 100.

Table 4: Correlation coefficients

Correlations	ln(Y/L)	Y/L growth	INST	n	ln(I/Y)	ln(G/Y)	ln(TO)	HC	ln(Infra)	ln(Inflation)	ln(Fin. Depth)
ln (Per capital RGDP)	1.00										
Per capita RGDP growth	-0.05	1.00									
Institutions (INST)	0.80	-0.07	1.00								
Pop. growth	-0.26	-0.07	-0.30	1.00							
ln(Investment rate)	0.18	0.29	0.18	-0.05	1.00						
ln(Government size)	0.30	-0.09	0.33	-0.17	0.06	1.00					
ln(Trade openness)	0.27	0.04	0.27	-0.03	0.24	0.16	1.00				
Human Capital	0.78	-0.01	0.70	-0.49	0.20	0.37	0.27	1.00			
ln(Infra)	0.88	-0.03	0.76	-0.46	0.20	0.31	0.26	0.83	1.00		
ln(Inflation)	-0.33	-0.01	-0.40	0.04	-0.11	-0.19	-0.12	-0.27	-0.27	1.00	
ln(Fin. Depth)	0.70	-0.11	0.74	-0.29	0.22	0.24	0.25	0.63	0.71	-0.36	1.00

Panel B: Coefficients of the correlations among Institutions measures

Correlations	INST	CC	GE	PV	RL	RQ	VA
INST	1.00						
Control of Corruption	0.95	1.00					
Government Effectiveness	0.95	0.93	1.00				
Political Stability/Absence of Violence	0.83	0.73	0.69	1.00			
Rule of Law	0.97	0.93	0.93	0.78	1.00		
Regulatory Quality	0.92	0.87	0.93	0.64	0.88	1.00	
Voice and Accountability	0.87	0.76	0.75	0.70	0.81	0.76	1.00

Notes: This table reports the coefficients of the correlations between variables. Panel A reports correlation coefficients for variables in the empirical model. Panel B reports correlations coefficients for all individual institutions measures and the aggregate variable INST. Variables are described in Table 3.

Table 5: System GMM dynamic panel data regressions: analyzing Institutions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
VARIABLES	ln(Y/L)	ln(Y/L)	ln(Y/L)	ln(Y/L)	ln(Y/L)	ln(Y/L)	ln(Y/L)	ln(Y/L)	ln(Y/L)	ln(Y/L)	ln(Y/L)	ln(Y/L)	ln(Y/L)
Per capita real GDP_{it-1}	0.980***	0.979***	0.949***	0.928***	0.919***	0.946***	0.929***	0.962***	0.954***	0.957***	0.922***	0.906***	0.955***
	(0.0102)	(0.0100)	(0.0112)	(0.0142)	(0.0188)	(0.0635)	(0.0716)	(0.018)	(0.020)	(0.023)	(0.0186)	(0.0718)	(0.0179)
INST	**0.241****	**0.233****	**0.256*****	**0.270*****	**0.248****	**0.317*****	**0.285*****	**0.373*****	**0.368*****	**0.238****	**0.205***	**0.243****	**0.289****
	(0.109)	**(0.109)**	**(0.0943)**	**(0.0964)**	**(0.110)**	**(0.0989)**	**(0.0844)**	**(0.130)**	**(0.133)**	**(0.098)**	**(0.119)**	**(0.101)**	**(0.134)**
INST x LATAM											**0.118****	**0.104****	**0.144****
											(0.057)	**(0.045)**	**(0.069)**
Population growth	-0.027***	-0.027***	-0.022***	-0.0103	-0.00320	-0.0105	-0.0140	-0.029***	-0.0279**	-0.0072	-0.00394	-0.0139	-0.025**
	(0.00764)	(0.00741)	(0.00766)	(0.00758)	(0.0107)	(0.00708)	(0.00981)	(0.0096)	(0.0136)	(0.0114)	(0.0103)	(0.00945)	(0.0126)
Investment rate	0.0733***	0.0653***	0.0251*	0.0164	0.0148	0.0187	0.0281*	0.0114	0.0093	0.0133	0.0174	0.0301*	0.00893
	(0.0242)	(0.0235)	(0.0143)	(0.0141)	(0.0152)	(0.0167)	(0.0165)	(0.0157)	(0.0173)	(0.0138)	(0.0156)	(0.0171)	(0.0136)
Government size		-0.084***	-0.076***	-0.053**	-0.11***	-0.0430	-0.0549*	-0.0726*	-0.115**	-0.0492	-0.11***	-0.059**	-0.12***
		(0.0248)	(0.0254)	(0.0241)	(0.0375)	(0.0297)	(0.0287)	(0.0418)	(0.051)	(0.0469)	(0.0375)	(0.0300)	(0.0428)
Trade openness			0.133***	0.147***	0.169***	0.0876***	0.109***	0.165***	0.187***	0.181***	0.148***	0.103***	0.160***
			(0.0332)	(0.0334)	(0.0375)	(0.0284)	(0.0375)	(0.0347)	(0.0388)	(0.042)	(0.0386)	(0.0339)	(0.0392)
Infrastructure				0.0449**	0.0468**					0.0192		0.0225	
				(0.0211)	(0.0226)					(0.0191)		(0.0360)	
Inflation					-0.018**		-0.012**		-0.0201**	-0.0040	-0.016**	-0.0128*	-0.0169*
					(0.00693)		(0.00592)		(0.00915)	(0.0080)	(0.00716)	(0.00661)	(0.00961)
Human Capital						0.0361	0.0251			0.0206	0.0510**		
						(0.0300)	(0.0387)			(0.0497)	(0.0220)		
Financial Depth								0.0511***	0.0500***	0.0684***			0.0385**
								(0.0139)	(0.0158)	(0.0190)			(0.0158)
Constant	0.00176	0.267*	0.0339	-0.00890	0.150	0.0537	-0.0638	0.0087	0.1317	-0.1472	0.177	-0.0652	0.206
	(0.141)	(0.143)	(0.150)	(0.151)	(0.195)	(0.180)	(0.176)	(0.205)	(0.246)	(0.201)	(0.199)	(0.184)	(0.200)
No. of instruments	178	178	178	178	146	132	132	112	112	106	146	132	146
Hansen test p-value	0.38	0.36	0.32	0.30	0.19	0.24	0.25	0.56	0.52	0.51	0.11	0.26	0.17
AB(2) test p-value	0.35	0.28	0.35	0.21	0.52	0.83	0.93	0.17	0.12	0.11	0.18	0.32	0.15
Observations	3,243	3,232	3,230	3,195	2,891	2,286	2,182	3,072	2,824	2,215	2,891	2,182	2,824
Number of countries	180	180	180	180	171	138	137	175	170	136	171	137	170

Notes: This table reports SGMM panel data regressions with country fixed effects from 1996 to 2015 (20 years). Variables are described in Table 3. We adopt INST as the exogenous variable in the regressions and assume reverse causation from Y/L to I/Y to address the endogeneity bias. Robust standard errors are reported in parentheses. Superscripts *, **, and *** refer to levels of significance of 10%, 5%, and 1%.

Table 6: System GMM dynamic panel data regressions: analyzing Rule of Law

VARIABLES	(1) ln(Y/L)	(2) ln(Y/L)	(3) ln(Y/L)	(4) ln(Y/L)	(5) ln(Y/L)	(6) ln(Y/L)	(7) ln(Y/L)	(8) ln(Y/L)	(9) ln(Y/L)	(10) ln(Y/L)	(11) ln(Y/L)	(12) ln(Y/L)	(13) ln(Y/L)
Per capita real GDP_{it-1}	0.979***	0.978***	0.948***	0.924***	0.920***	0.968***	0.947***	0.951***	0.953***	0.957***	0.921***	0.919***	0.952***
	(0.00972)	(0.00954)	(0.0113)	(0.0143)	(0.0190)	(0.0575)	(0.0668)	(0.0183)	(0.0187)	(0.0222)	(0.0195)	(0.0692)	(0.0162)
Rule of Law	**0.226****	**0.229*****	**0.244*****	**0.265*****	**0.246*****	**0.235*****	**0.209*****	**0.424*****	**0.362*****	**0.223*****	**0.224*****	**0.166***	**0.266*****
	(0.0882)	**(0.0853)**	**(0.0651)**	**(0.0671)**	**(0.0775)**	**(0.0761)**	**(0.0727)**	**(0.112)**	**(0.116)**	**(0.0694)**	**(0.0835)**	**(0.0862)**	**(0.102)**
RL x LATAM											**0.099*****	**0.096*****	**0.120*****
											(0.0372)	**(0.0299)**	**(0.0460)**
Population growth	-0.027***	-0.027***	-0.023***	-0.00995	-0.00460	-0.0111	-0.0138	-0.028***	-0.0296**	-0.0110	-0.00550	-0.0143	-0.029***
	(0.00738)	(0.00713)	(0.00727)	(0.0078)	(0.0111)	(0.0067)	(0.0099)	(0.00899)	(0.0122)	(0.0119)	(0.0108)	(0.00955)	(0.0109)
Investment rate	0.073***	0.065***	0.0263*	0.0152	0.0206	0.0206	0.0280*	0.00484	0.00818	0.0149	0.0203	0.0332*	0.0122
	(0.0247)	(0.0231)	(0.0136)	(0.0142)	(0.0146)	(0.0168)	(0.0165)	(0.0177)	(0.0188)	(0.0136)	(0.0155)	(0.0177)	(0.0129)
Government size		-0.081***	-0.073***	-0.0518**	-0.106***	-0.0369	-0.0509*	-0.0672	-0.112**	-0.0412	-0.098***	-0.0578*	-0.116***
		(0.0248)	(0.0242)	(0.0249)	(0.0354)	(0.0285)	(0.0308)	(0.0427)	(0.0483)	(0.0485)	(0.0354)	(0.0317)	(0.0448)
Trade openness			0.136***	0.149***	0.162***	0.084***	0.109***	0.175***	0.191***	0.192***	0.141***	0.099***	0.166***
			(0.0333)	(0.0345)	(0.0393)	(0.0284)	(0.0354)	(0.0378)	(0.0410)	(0.0409)	(0.0415)	(0.0335)	(0.0393)
Infrastructure				0.0434**	0.0478**					0.0192	0.0539**		
				(0.0212)	(0.0231)					(0.0204)	(0.0218)		
Inflation					-0.0140**		-0.0111*		-0.0172*	-0.00196	-0.0124*	-0.0131*	-0.0137
					(0.00654)		(0.0062)		(0.00960)	(0.00752)	(0.00701)	(0.00693)	(0.00927)
Human Capital						0.0341	0.0254			0.000993		0.0189	
						(0.0320)	(0.0352)			(0.0567)		(0.0348)	
Financial Depth								0.065***	0.059***	0.073***			0.045***
								(0.0150)	(0.0182)	(0.0189)			(0.0162)
Constant	0.0128	0.266*	0.0208	0.0165	0.122	0.0650	-0.0511	0.106	0.151	-0.149	0.176	-0.0692	0.203
	(0.136)	(0.139)	(0.148)	(0.153)	(0.177)	(0.171)	(0.186)	(0.204)	(0.219)	(0.190)	(0.193)	(0.183)	(0.191)
No. of instruments	178	178	178	178	146	132	132	112	112	106	146	132	146
Hansen test p-value	0.38	0.36	0.32	0.30	0.19	0.24	0.25	0.56	0.52	0.51	0.11	0.26	0.17
AB(2) test p-value	0.35	0.28	0.35	0.21	0.52	0.83	0.93	0.17	0.12	0.11	0.18	0.32	0.15
Observations	3,243	3,232	3,230	3,195	2,891	2,286	2,182	3,072	2,824	2,215	2,891	2,182	2,824
Number of countries	180	180	180	180	171	138	137	175	170	136	171	137	170

Notes: This table reports SGMM panel data regressions with country fixed effects from 1996 to 2015 (20 years). Variables are described in Table 3. We adopt RL as the exogenous variable in the regressions and assume reverse causation from Y/L to I/Y to address the endogeneity bias. Robust standard errors are reported in parentheses. Superscripts *, **, and *** refer to levels of significance of 10%, 5%, and 1%.

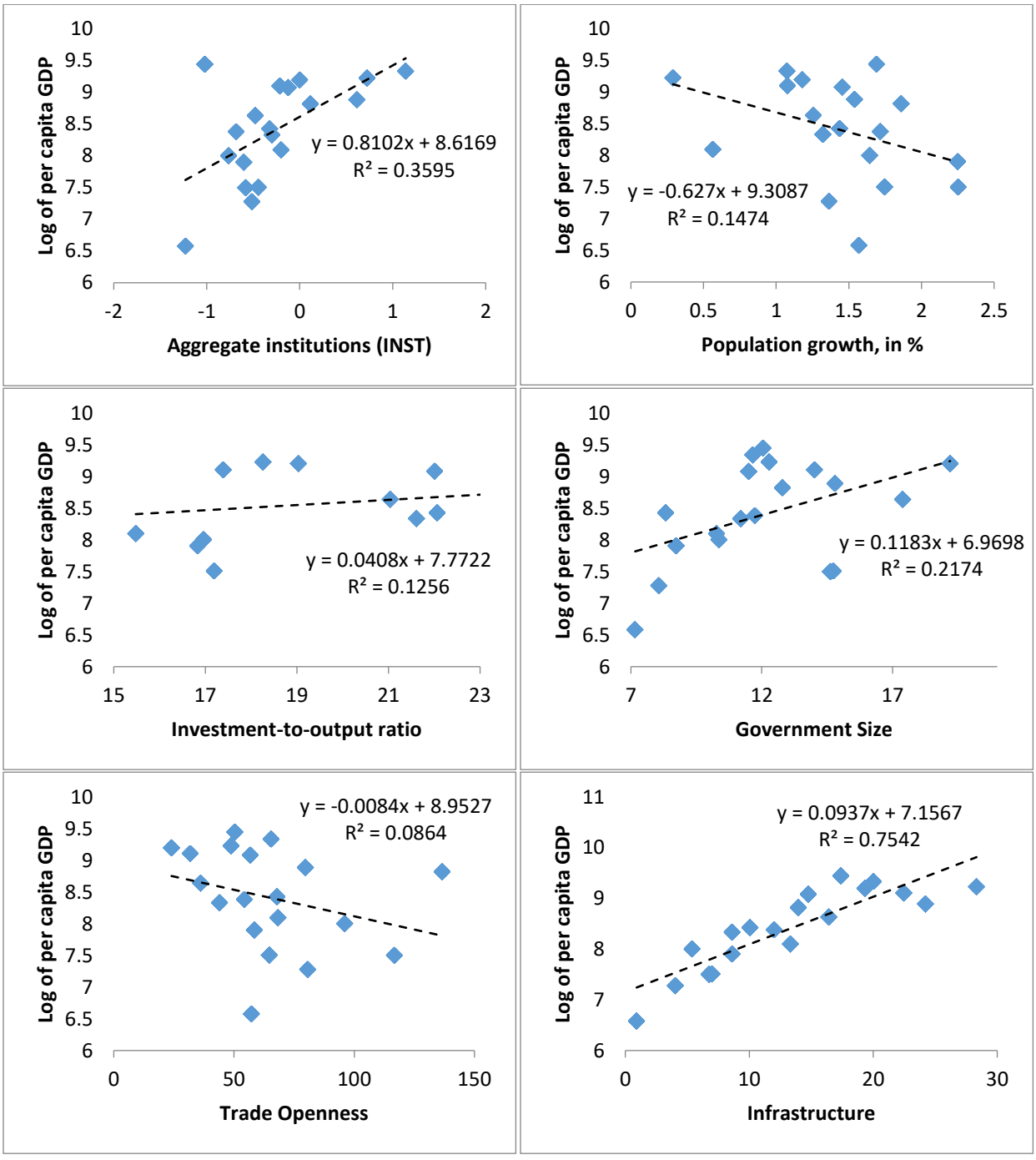
Table 7: System GMM dynamic panel data regressions: analyzing Political Stability / Absence of Violence

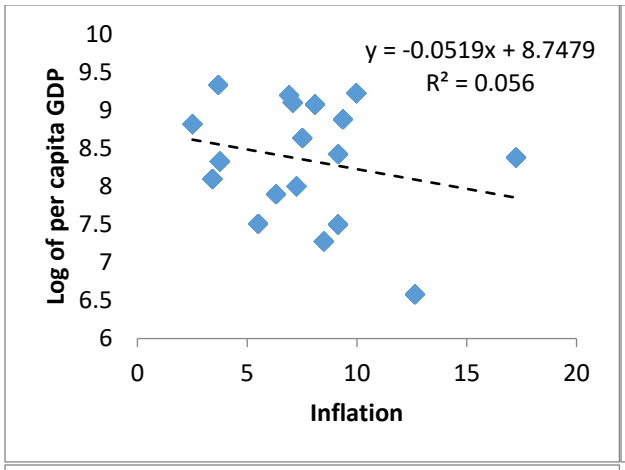
VARIABLES	(1) ln(Y/L)	(2) ln(Y/L)	(3) ln(Y/L)	(4) ln(Y/L)	(5) ln(Y/L)	(6) ln(Y/L)	(7) ln(Y/L)	(8) ln(Y/L)	(9) ln(Y/L)	(10) ln(Y/L)	(11) ln(Y/L)	(12) ln(Y/L)	(13) ln(Y/L)
Per capita real GDP_{it-1}	0.979***	0.977***	0.956***	0.912***	0.905***	0.931***	0.933***	0.972***	0.972***	0.956***	0.904***	0.934***	0.960***
	(0.00812)	(0.00854)	(0.0101)	(0.0165)	(0.0212)	(0.0677)	(0.0779)	(0.0181)	(0.0172)	(0.0254)	(0.0223)	(0.0793)	(0.0174)
Political Stability	**0.129*** **	**0.119*** **	**0.089*** **	**0.085*** **	**0.0596***	**0.103*** **	**0.079*** **	**0.0515**	**0.0609**	**0.00301**	**0.0692** **	**0.079*** **	**0.0678** **
	(0.0338)	**(0.0358)**	**(0.0318)**	**(0.0320)**	**(0.0312)**	**(0.0267)**	**(0.0213)**	**(0.0489)**	**(0.0424)**	**(0.0367)**	**(0.0324)**	**(0.0239)**	**(0.0317)**
PV x LATAM											**0.0759***	**0.0491***	**0.106** **
											(0.0404)	**(0.0278)**	**(0.0456)**
Population growth	-0.029***	-0.028***	-0.026***	-0.00875	-0.000960	-0.0122*	-0.0178	-0.031***	-0.037***	-0.00957	-0.00121	-0.0178	-0.033***
	(0.00804)	(0.00782)	(0.00807)	(0.00805)	(0.0112)	(0.00731)	(0.0114)	(0.00946)	(0.0120)	(0.0139)	(0.0122)	(0.0114)	(0.0114)
Investment rate	0.073***	0.064***	0.0277*	0.0119	0.0175	0.0205	0.0332**	0.0247	0.0296**	0.0242*	0.0160	0.0334**	0.0181
	(0.0208)	(0.0190)	(0.0149)	(0.0154)	(0.0135)	(0.0181)	(0.0144)	(0.0156)	(0.0148)	(0.0145)	(0.0139)	(0.0142)	(0.0136)
Government size		-0.082***	-0.076***	-0.0557*	-0.112***	-0.0439	-0.0557*	-0.0873**	-0.0941*	-0.0576	-0.120***	-0.0553*	-0.121**
		(0.0235)	(0.0290)	(0.0292)	(0.0336)	(0.0301)	(0.0292)	(0.0390)	(0.0533)	(0.0468)	(0.0382)	(0.0286)	(0.0492)
Trade openness			0.122***	0.158***	0.169***	0.088***	0.102***	0.146***	0.162***	0.168***	0.180***	0.102***	0.163***
			(0.0335)	(0.0355)	(0.0368)	(0.0306)	(0.0372)	(0.0320)	(0.0375)	(0.0375)	(0.0406)	(0.0364)	(0.0380)
Infrastructure				0.0629***	0.0715***					0.0335	0.0673***		
				(0.0218)	(0.0231)					(0.0219)	(0.0257)		
Inflation					-0.021***		-0.015**		-0.0218**	-0.00796	-0.023***	-0.015**	-0.024***
					(0.00736)		(0.00655)		(0.00875)	(0.00753)	(0.00772)	(0.00629)	(0.00825)
Human Capital						0.0407	0.0190			0.0151		0.0186	
						(0.0320)	(0.0377)			(0.0565)		(0.0378)	
Financial Depth								-0.043***	-0.044***	-0.068***			-0.032**
								(0.0157)	(0.0167)	(0.0189)			(0.0158)
Constant	0.0202	0.285**	0.0263	0.0480	0.199	0.0275	-0.0573	-0.0215	-0.0371	-0.100	0.193	-0.0586	0.113
	(0.112)	(0.116)	(0.144)	(0.138)	(0.177)	(0.153)	(0.174)	(0.182)	(0.240)	(0.187)	(0.197)	(0.171)	(0.199)
No. of instruments	178	178	178	178	146	132	132	112	112	106	146	132	146
Hansen test p-value	0.38	0.36	0.32	0.30	0.19	0.24	0.25	0.56	0.52	0.51	0.11	0.26	0.17
AB(2) test p-value	0.35	0.28	0.35	0.21	0.52	0.83	0.93	0.17	0.12	0.11	0.18	0.32	0.15
Observations	3,243	3,232	3,230	3,195	2,891	2,286	2,182	3,072	2,824	2,215	2,891	2,182	2,824
Number of countries	180	180	180	180	171	138	137	175	170	136	171	137	170

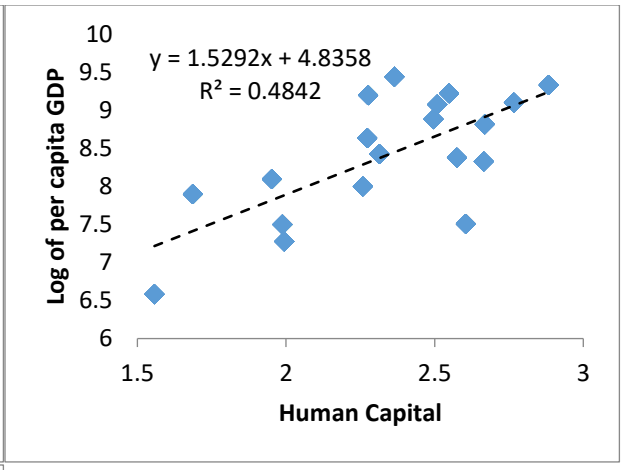
Notes: This table reports SGMM panel data regressions with country fixed effects from 1996 to 2015 (20 years). Variables are described in Table 3. We adopt PV as the exogenous variable in the regressions and assume reverse causation from Y/L to I/Y to address the endogeneity bias. Robust standard errors are reported in parentheses. Superscripts *, **, and *** refer to levels of significance of 10%, 5%, and 1%.

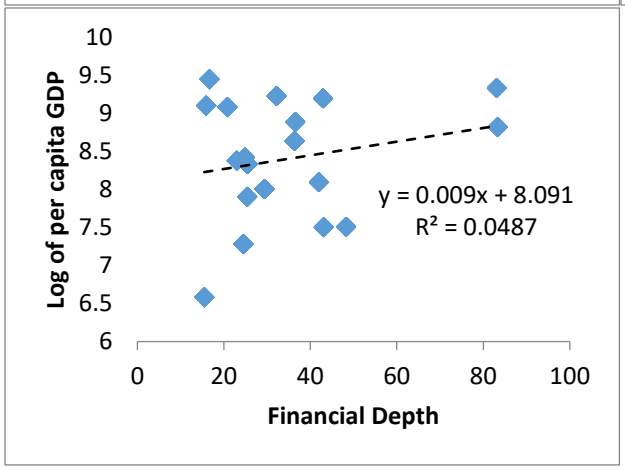
Figure 1: Scatter plots of per capita output growth vs. explanatory variables

This figure reports, for Latin America, the relationships between the per capita output growth rate and the independent variables of the empirical model. The plots are the averages of the variables of each Latin American country in the sample. The period of the sample is from 1996 to 2015.




y = -0.0519x + 8.7479
R² = 0.056
Log of per capita GDP
Inflation
10
9.5
9
8.5
8
7.5
7
6.5
6
0
5
10
15
20


y = 1.5292x + 4.8358
R² = 0.4842
Log of per capita GDP
Human Capital
10
9.5
9
8.5
8
7.5
7
6.5
6
1.5
2
2.5
3


y = 0.009x + 8.091
R² = 0.0487
Log of per capita GDP
Financial Depth
10
9.5
9
8.5
8
7.5
7
6.5
6
0
20
40
60
80
100