

10-26-2011

The Finance–Growth Link Revisited and the Role of Institutions as a Source of Finance in Latin America

Luisa Blanco

Pepperdine University, luisa.blancoraynal@pepperdine.edu

Follow this and additional works at: <https://digitalcommons.pepperdine.edu/sppworkingpapers>



Part of the [Economic Policy Commons](#), and the [Latin American Studies Commons](#)

Recommended Citation

Blanco, Luisa, "The Finance–Growth Link Revisited and the Role of Institutions as a Source of Finance in Latin America" (2011). Pepperdine University, *School of Public Policy Working Papers*. Paper 32. <https://digitalcommons.pepperdine.edu/sppworkingpapers/32>

This Article is brought to you for free and open access by the School of Public Policy at Pepperdine Digital Commons. It has been accepted for inclusion in School of Public Policy Working Papers by an authorized administrator of Pepperdine Digital Commons. For more information, please contact bailey.berry@pepperdine.edu.

The Finance–Growth Link Revisited and the Role of Institutions as a Source of Finance in Latin America

Luisa Blanco*
School of Public Policy
Pepperdine University
lblanco@pepperdine.edu

Abstract

In a panel framework that includes 18 countries, this paper studies the short and long run effect of financial development on economic growth and the determinants of financial development in Latin America. Financial development shows a positive effect on economic growth in the long run, but a negative effect in the short run for the full sample. When the sample is divided by income levels, this result holds only for the high income group. For the low income group, financial development has no significant effect on economic growth in the short run or in the long run. In the analysis of the determinants of financial development in Latin America, greater financial openness and lower country risk are associated with higher levels of financial development. From the components of the country risk index (financial, economic, and political risk) only the political risk index comes up positively significant. From the components of the political risk index, only law and order and government stability have a positive significant effect on financial development.

Preliminary Draft – Please do not cite without permission

10/26/2011

JEL Categories: G21, O16, O43, O54

Key Words: Financial development, economic growth, institutions, political stability, Latin America

*I am thankful to Jeffrey Nugent and William Sawyer for giving me excellent comments on how to improve my work. I also received helpful comments at seminars at the University of Southern California and Texas Christian University and at the WEAI conference. All errors are my own.

I. Introduction

The improvement of financial markets in Latin American countries in the last two decades is prominent and well known. Private credit as share of GDP for the Latin American region went from 17 percent in the period 1970-1974, to 31 percent in the period 2005-2008 (period average).¹ The significant development of the financial sector in Latin America has led to an increasing interest on studying the relationship between financial development and economic growth in this region.

While there is a vast amount of work on the finance-growth link, there is no consensus on the impact of financial development on economic growth. While, several theoretical and empirical analyses show that financial development leads to economic growth, some provide evidence that financial development has no significant effect on economic growth. Others argue that the effect is dependent on certain conditions, and that financial development might have a negative effect in some cases. Thus, the study of the finance-growth link continues to be a topic of interest. There has also been an increasing interest on studying what factors explain financial development.

This paper studies the impact of financial development on economic growth in the short and long run and the determinants of financial development in Latin America. This analysis contributes to the literature in several ways. First, it expands on Loayza's and Ranciere (2006) study of the impact of financial development on economic growth by focusing only on the Latin American region and expanding the sample period. Second, along the work of Rioja and Valev (2004a), this analysis studies the long and short term effect of financial development on economic growth across different income groups. Third, in relation of the study of the determinants of financial development, this paper expands on

¹ Author's calculation with the data used in this analysis.

Chin's and Ito (2006) and Baltagi's et al. (2009) work by focusing on Latin American countries, expanding the sample period, and considering other factors related to institutions and country stability as possible determinants of financial development.

This paper answers the following questions for the Latin American region: 1) What is the effect of financial development on economic growth at different time frames and across countries with different income levels? 2) What factors lead to greater financial development? Studying financial development in the Latin American region is relevant for two reasons. First, Latin America is a natural laboratory to study the impact and determinants of financial development because these countries have experienced significant improvements in the financial sector in the last decades. Second, previous empirical evidence has shown that we cannot generalize in relation to financial development and pursuing region specific analyses is necessary. Countries in the region share a historical, political and socioeconomic background, which is important to consider when studying financial development.

Using panel data during the period 1961-2007 in a panel framework for 18 Latin American countries, the main findings in relation to the effect of financial development in economic growth are the following. For the full sample, financial development has a significant positive effect on economic growth in the long run, but a significant negative effect in the short run. This finding goes according to Loayza's and Ranciere (2006) finding. However, when the sample is divided in two groups, this result only holds for the high income group. For the low income group, financial development has no significant effect in the long run or in the short run. In the analysis of the determinants of financial development, using 5 year average observations during the period 1970-2007, greater

financial openness and lower country risk are associated with greater financial development. Financial openness seems to benefit the most in those countries that are relatively closed. When the country risk index is disaggregated by the financial, political, and economic risk indices, only the political risk index has a positive significant effect on financial development (the higher the value of the index, the less political risk there is). There are only two components from the political risk index that have a significant positive effect on financial development, law and order and government stability.

This paper is organized as follows. Section II presents a brief literature review on the finance-growth link and on the determinants of financial development. Sections III and IV describe the data and the methodology. Section V presents the results, and Section VI concludes.

II. Literature Review

A. The Finance-Growth Link

While the general belief is that financial development has a positive effect on economic growth (supply leading hypothesis), there is theoretical and empirical work supporting that this effect is non-existent and that financial development is just a consequence of economic growth (demand following hypothesis). Financial development can be generally defined as increasing access to credit, and the positive effect of financial development on growth is derived from the effect financial development has on capital accumulation and productivity (Beck, Levine, and Loayza, 2000). With the development of the financial sector there is greater access to capital that results in more funding available for good investment opportunities. Greater access to capital leads to greater labor

specialization and more access to new technology (Rajan and Zingales, 2003; Saint-Paul, 1992). Consequently, improvements in capital markets lead to greater economic growth.²

On the other hand, there has been some skepticism about the benefits derived from financial development. There are three main reasons to be skeptical about the impact of financial development on economic growth. First, there is research that supports the demand following hypothesis, where financial development is just a consequence of economic growth (Shan, 2005). Second, the impact of financial development on economic growth seems to be dependent on certain conditions. There is empirical evidence showing that the effect of financial development on growth is different across regions and among countries with different income levels, levels of financial development, and institutional set ups (see Aghion et al. 2005; Blanco, 2009; De Gregorio and Guidotti 1995; Rioja and Valev 2004a,b; Shen and Lee, 2006; among others). Third, financial development can produce greater macroeconomic volatility, becoming a destabilizing force in the economy (Loayza and Ranciere, 2006). When financial development leads to volatility, it is expected that financial development will have a negative effect on economic growth. According to Loayza and Ranciere (2006), the short run effect of financial development on economic growth might be reflected negative economic growth as a result of macroeconomic instability, and the long run effect is expected to be positive in terms of economic growth. Thus, looking at the impact of financial development at different time frames is necessary.

In the Latin American context, where countries have experienced periods of significantly volatility, distinguishing the short and long run effect of financial development is of special interest to policymakers. When studying the impact of financial

² Refer to Blanco (2009) and Levine (2005) for a thorough discussion of the literature on the finance-growth link. Odhiambo (2007) presents a good discussion on the supply leading and demand following hypotheses.

development on economic growth, it is also important to keep in mind that financial development might have a differential impact on growth depending on specific country conditions. Some countries will be better equipped to absorb the influx of credit. It is likely that specific country characteristics, in relation to their level of development (i.e. income) might determine a country's ability to use the influx of credit productively. For this reason, studying the impact of financial development for countries with different income levels is relevant for the design of future policies related to financial markets in Latin America.

B. The Sources of Finance

In the review of the literature, the factors that have been considered as the main determinants of financial development are the degree of openness, institutions, and political stability. Liberalization of the goods and capital markets are associated with greater financial development (Baltagi et al., 2009; Chinn and Ito, 2006; Klein and Olivei, 2008). Openness to trade and capital flows have been proposed as important determinants of financial development. According to Rajan and Zingales (2003), there will be a group of people who will oppose to financial development due to the competition it brings. With trade and financial liberalization, the power of those who are opposed to financial development is significantly weakened. Therefore, substantial financial reforms take place when the power of interests groups is diminished with openness, leading to greater financial development.

Financial liberalization is associated with the strengthening of the financial system in two ways.³ First, as a result of financial liberalization, the entrance of foreign banks into

³ Refer to Chinn and Ito (2006) and Klein and Olivei (2008) for a comprehensive literature review of the channels through which financial liberalization leads to greater financial development.

the domestic financial sector leads to an increase in available loanable funds and efficiency. Efficiency in the financial sector increases significantly with financial liberalization since there is greater competition and greater pressure to reform the financial sector. Second, Klein and Olivei (2008) argue that a virtuous cycle of greater savings and efficiency is created with increasing capital account openness because financial intermediaries are able to achieve economies of scale.

Furthermore, institutions seem to play a key role explaining the differences in financial development across countries.⁴ According to Chinn and Ito (2006), there are two different categories of institutions that have been considered as important determinants of financial development: 1) Institutions that affect the economy as a whole, and 2) Institutions that affect the financial sector. In the first group, the relevant institutions are related to bureaucratic quality, law and order, and control of corruption, among others. Because these institutional factors directly affect the way of doing business and relate to perceptions on the stability of the legal system, it is expected that they are associated with greater levels of financial development.

The second group of institutions includes those institutions that specifically affect the financial sector. According to Djankov et al. (2007), institutions that increase the power of creditors and the access to lending information are crucial for financial development. When creditor rights are enforced, credit is likely to expand because creditors feel more protected against default. Creditors are also more likely to lend when they are able to get more information about potential lenders. Greater financial depth is expected when there is

⁴ Beck and Levine (2005) present an excellent review of the literature on the relationship between institutions and financial development.

an increase in the access to information on lenders and protection to private credit institutions.

Furthermore, the stability of a specific country might significantly affect capital markets. The degree to which there is stability in a country affects investors' perceptions, and consequently their willingness to invest in that country. According to Roe and Siegel (2009), a country's capacity to protect investors is related to political stability. Thus, countries with unstable political systems offer low protection to investors.

Empirical evidence on the importance of openness and institutions as factors explaining financial development is abundant. Herger's et al. (2008) cross-sectional analysis shows that trade openness has a significant effect on financial development. In a panel framework that includes only less developed countries, Baltagi et al. (2009) find that trade and financial openness explain financial development. They interact trade and financial openness, and find that this interaction term is negative. They conclude that while financial development requires both types of openness, relatively closed economies benefit the most from opening up to trade or capital. Chinn and Ito (2006) find that at certain institutional threshold, financial liberalization has a positive effect on financial development. Results from Klein's and Olivei (2008) are along the lines of Chinn's and Ito (2006) findings. Klein and Olivei (2008) find that institutions drive the positive effect of financial liberalization on financial development, where developed countries that have better institutions get greater benefits from financial liberalization. The openness to trade and capital flows experienced during the process of globalization is likely to be associated with institutional reforms that significantly affect capital markets (Mishkin, 2009).

There is also empirical evidence on the impact of institutions and political stability on financial development. Acemoglu and Johnson (2005) provide evidence that institutions that affect all sectors of the economy have a significant direct effect on financial development. They show empirically that property rights and contracting institutions are important determinants of financial development. Beck et al. (2003) also find that institutions, either shaped by legal origins or initial endowments, have a significant effect on financial development in a sample of 70 former colonies. Andrianova et al. (2008) also find evidence that institutions related to governance have a significant effect on financial development, where lower quality of institutions are associated with greater government ownership in the financial sector. In relation to institutions that affect capital markets, Djankov et al. (2007) present strong empirical evidence that creditor rights and access to lending information are important determinants of financial development. Additionally, Roe and Siegel (2009) present empirical evidence showing that political instability explains financial backwardness.

While there are several papers on the determinants of financial development, few have taken a regional approach. When studying the factors that lead to greater financial depth is important to focus on regions that share historical, political, and socio-economic backgrounds. It cannot be expected that the same factors that explain financial development in a specific country in Asia or Africa should explain capital markets in Latin America. By taking a regional approach to the study of the sources of finance, more specific policy recommendations could be provided.

III. Data

The data used in this analysis is divided in two parts. For the first part, which focuses on determining the impact of financial development on economic growth in the short and long run, yearly observations between 1961 and 2007 are used. For the second part, which focuses on studying the determinants of financial development in Latin America, five year average observations between 1970 and 2007 are used. The 18 Latin American countries included in both parts of the analysis are Argentina, Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela. Countries were selected in the basis of data availability over a long period of time.

This analysis uses the indicator of financial development most commonly used in previous work, private credit as a share of GDP.⁵ This indicator comes mainly from Beck's, Demirguc-Kunt, and Levine (2000) data on financial structure updated in 2010. From this dataset, a large number of observations were missing for Argentina, Bolivia, Chile, Peru, and Uruguay. Thus, private credit as a share of GDP was estimated for those countries following Beck's, Demirguc-Kunt, and Levine (2000) methodology and using data from the International Financial Statistics (IMF, 2010).⁶

⁵ This analysis emphasizes on financial development in relation to the banking sector. While studying the impact of equity markets on growth and its determinants for the Latin American region is relevant, consistent data across the region for a large period of time is not available. Furthermore, financial markets in Latin America are more based on the banking sector, which makes the focus on private credit as an indicator of financial development a good approach.

⁶ Constructed data on financial development indicators in Latin America is available upon request. Correlation between the constructed data and the available observations in Beck's, Demirguc-Kunt, and Levine (2000) dataset is always around 0.99, which confirms the use of the appropriate methodology. For Colombia, some missing observations were filled in with linear interpolation.

Data on real GDP per capita, population, government spending as a share of GDP, and trade openness is obtained from the Penn World Tables (Heston et al., 2009).⁷ Data on financial openness is obtained from Chinn and Ito (2008), and data on inflation is obtained from the International Financial Statistics (IMF, 2010). Data on banking crisis was obtained from Laeven and Valencia (2008) and Caprio and Klingebiel (2003). Data on country risk is obtained from the Political Risk Services Group (2010). Other data used to construct a measure of trade openness that is exogenous in the growth equation comes from United Nations Commodity Trade Statistics Database (UNCOMTRADE, 2010) and Mayer and Zignago (2006). Table 1 includes a description of the variables used in this analysis and their sources. Tables 2 and 3 show the summary statistics for both parts of the analysis.

IV. Methodology

A. Impact of Financial Development on Economic Growth

When studying the impact of financial development on economic growth in the short and long run for Latin America, this analysis follows Loayza's and Ranciere (2006) methodology closely. Loayza and Ranciere (2006) propose using the Pooled Mean Group (PMG) estimator developed by Pesaran et al. (1999).⁸ For the PMG estimator, an autoregressive distributive lag (ARDL(p,q,q,...,q)) dynamic panel specification is applied. A vector error correction model (VECM) is considered under this specification, where the short run dynamics of the variables in the system are influenced by the deviation from equilibrium. The ARDL(p,q,q,...,q) used for the PMG estimator is specified as follows

⁷ Real GDP per capita is estimated extrapolating 1996 values in international dollars, which make this indicator comparable across countries.

⁸ Refer to Loayza and Ranciere (2006) for an explanation of the appropriateness of the PMG estimator when disentangling the finance-growth link and a description of this methodology. Refer also to Blackburne and Frank (2007) for a description of the PMG estimator and how it is estimated in Stata.

$$y_{it} = \sum_{j=1}^p \lambda_{ij} y_{i,t-j} + \sum_{j=0}^q \delta_{ij}' X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (1)$$

Where y_{it} represents the dependent variable for $t = 1, 2, \dots, T$ time periods, and $i = 1, 2, \dots, N$ groups. $X_{i,t-j}$ is the $k \times 1$ vector of explanatory variables (regressors) for group i , δ_{ij} are $k \times 1$ coefficient vectors, λ_{ij} are scalars, μ_i represents the fixed effect, and ε_{it} the time varying disturbance. Equation 1 can be reparametrized in the following way and time series observations for each group are stacked

$$\Delta y_i = \phi_i y_{i,-1} + X_i \beta_i + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{i,-j} + \sum_{j=1}^{q-1} \Delta X_{i,-j} \delta_{ij}^* + \mu_i \iota + \varepsilon_i \quad (2)$$

Where y_i is a $t \times 1$ vector of the observations of the dependent variable of the i th group, X_i is a $t \times k$ matrix of the regressors that vary across groups and time periods, ι is a $t \times 1$ vector of 1s. One of the main requirements of this model specification is the existence of a long run relationship between y_{it} and X_{it} , where the error-correcting speed of adjustment term for the long run relationship represented by ϕ_i must be significantly negative (and no lower than -2). The long run relationship between y_{it} and X_{it} for each group is expressed as follows

$$y_{it} = -(\beta_i / \phi_i) X_{it} + \eta_{it} \quad (3)$$

Where η is a stationary process. For the long run homogeneity assumption, the coefficients on X_i are the same across groups. Long run coefficients of X_i are expressed as $\theta_i = -\beta_i / \phi_i$, where $\theta_i = \theta$. In the PMG estimator, while the long run coefficients are equal across groups, the intercept, short run coefficients, and error variances differ across countries.⁹

⁹ Please refer to Blackburne and Frank (2007) for a good explanation of the specification of PMG model. Asteriou and Hall (2007) also provide a brief discussion of the PMG estimator.

For the PMG estimation in this analysis, real GDP growth (first difference of the natural log of real GDP per capita) is the dependent variable and financial development (private credit in natural logs) is in the right hand side of the equation. Initial GDP per capita (natural log), government size (natural log), trade, and inflation are included as control variables.¹⁰ A dynamic specification of the form ARDL(3,3,1,1,1,1) is used, and all variables are time-demeaned.¹¹ All independent variables are entered in levels for the long run relationships and in first difference for the short run relationships. The ARDL form specified above includes the first and second lag of the first difference of real GDP and private credit as regressors. Annual observations between 1961 and 2007 are used for this part of the analysis. Because of the lag structure of the model, estimations will include observations between 1964 and 2007 (44 observations per country).

B. The Determinants of Financial Development

The approach taken to find out what factors explain financial development in Latin America in this analysis is similar to the one used by Baltagi et al. (2009). The dynamic panel General Method of Moments (GMM) suggested by Arellano and Bond (AB, 1991) is implemented and an ARDL(p, q, q, ..., q) specification is considered for the AB estimator. For the AB estimator, the first lag of the dependent variable is included in the right hand side of the equation, which leads to endogeneity issues since the lag of the dependent variable is determined by the error term. This endogeneity problem biases the estimates provided by the general GMM. Arellano and Bond (1991) propose differencing the data to

¹⁰ These variables are constructed following Loayza's and Ranciere (2006) approach; refer to Table 1 for a description of how these variables were constructed.

¹¹ Lag lengths selected based on the Augmented Dickey-Fuller (ADF) regressions. The number of lags is selected in a way where the Akaike Information Criterion (AIC) for the regression is minimized. This process is done for each panel.

address for the endogeneity of the right hand side variables and for specific country characteristics. The Arellano and Bond (1991) GMM uses lagged levels of the dependent variable as instruments to address for the endogeneity of the dependent variable. The model specification of the AB estimator can be expressed as

$$\Delta y_{it} = \rho \Delta y_{i,t-1} + \Delta X_{it} \beta + \Delta \varepsilon_{it} \quad (4)$$

Equation 4, which represents first difference transformation and removes the constant term and the individual effects, shows that the lag of the dependent variable is included as regressor and X_{it} is the $tN \times k$ matrix of the explanatory variables. For this estimation, the instruments used are the available lags of the levels of the endogeneous variables.

Arellano's and Bond (1991) methodology is appropriate for datasets with many panels and few periods. For this reason, and to smooth out short run fluctuations in the data, five year average observations are considered in this part of the analysis. Five year average observations are constructed using available observation between 1970 and 2007. Financial development growth (the first difference of private credit as a share of GDP in natural log) is used as dependent variable, and its first lag enters in the right hand side of the equation. The real GDP per capita growth (first difference of real GDP per capita in natural log) and a dummy for banking crisis are entered as control variables.¹² The variables of interest that enter in the right hand side of the equation are trade openness (natural log), financial openness, the interaction between trade and financial openness, and the country risk

¹² Time dummies were not included since they are not significant in most of the estimations, and their inclusion leads to estimates that violate the assumption that idiosyncratic errors are independently and identically distributed (i.i.d). Note that private credit and real GDP are entered in first difference initially as we are interested on considering the relationship between the growth rates of these variables.

index.¹³ The country risk index is a composite indicator of political, financial, and economic risk indices. Thus, the model will be estimated by including the components of the country risk index.¹⁴ Several indicators related to institutions and country stability compose the political risk index, and the model will be estimated including these indicators one at the time. Due to data unavailability, the time period is reduced when the institutional and political stability variables are included. In the model specification shown in Equation 4, it is observed that the first difference is taken from all variables to transform the equation into the difference GMM. The lagged levels of financial development growth are used to form GMM-type instruments.

V. Results

A. Impact of Financial Development on Economic Growth

Table 4 presents the estimates obtained when using the PMG estimator to determine the short and long run effect of financial development on economic growth for the full sample. The first two columns show the coefficients and the standard errors for the full sample. In this estimation, the long run coefficients of all control variables but inflation are significant at the 1 percent level. The coefficients for initial GDP per capita and government size are different than what was expected, but trade and inflation have the expected signs. For the short run estimates, all control variables, but trade, are statistically

¹³ This analysis focuses on testing empirically the effect of financial openness on financial development, which relates to the liberalization of the capital account. Financial liberalization is defined by Ranciere et al (2008) as the deregulation of the domestic financial markets, in addition to the liberalization of the capital account. Financial openness and financial liberalization terms are used interchangeable by several in the literature, but it is important to make the distinction when doing empirical analyses. For example, Abiad and Mody (2005) and Abiad et al. (2008) construct an index of financial liberalization that focus on financial reform and present an analysis of the factors explaining it. Chinn's and Ito (2008) financial openness index, which is used in this analysis, relates only to liberalization of the capital account.

¹⁴ Refer to Table 1 for a description of how is the country risk index constructed and its components.

significant. Only the coefficient sign for initial GDP per capita is unexpected. The first lag of the dependent variable is positive and statistically significant. Financial development has a positive significant effect at the 1 percent level on economic growth in the long run. For the short run, financial development has a negative effect, where only its first difference is statistically significant at the 5 percent level. The first difference of the second lag of financial development has a negative effect, but it is marginally significant (significant at 10 percent level). The positive and negative effect in the long and short run respectively, goes according to Loayza's and Ranciere (2006) finding.

Following Blanco's (2009) approach, this analysis also evaluates the possibility that the effect of financial development is different across different income groups. Based on countries' real GDP per capita in the middle of the sample period (in year 1985), the sample is divided in high and low income countries. The countries included in the high income group are Argentina, Chile, Colombia, Costa Rica, Mexico, Panama, Trinidad and Tobago, Uruguay, and Venezuela. The countries included in the low income group are Bolivia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Paraguay, and Peru. In Table 4, columns 3 and 4 present the coefficients and standard errors for the high income group, and columns 5 and 6 show estimates for the low income group. For the high income group the signs and significance of most coefficients stay the same. Financial development shows a significant positive effect in the long run at the 1 percent level, but a marginally significant negative effect in the short run (10 percent level). For the low income group, the significance and sign of the coefficients changes

dramatically. In this estimation, financial development shows no significant effect on economic growth in the short or in the long run.¹⁵

B. Determinants of Financial Development

Estimates of the model of the determinants of financial development in Latin America are shown in Tables 5 and 6. In Table 5, the first two columns show the coefficients and standard errors for the baseline model that does not include variables related to institutions or stability. In this estimation, real GDP growth has a positive significant effect at the 1 percent level, which was expected. Banking crisis also has a positive significant effect, which was unexpected. A reason why this coefficient might be positive is that this indicator might capture the period of time where restructuring of the financial sector takes place. Trade openness has a negative sign and it is not statistically significant, which was unexpected. Financial openness and the interaction term between financial and trade openness are significant at the 1 percent level. While the coefficient for financial openness has a positive sign, its interactive term with trade openness is negative. This finding goes according to Baltagi et al. (2009). The negative coefficient of the interaction term implies that the effect of capital openness on financial development will be larger for relatively closed economies than for relatively open economies.

¹⁵ A Hausman test was performed to ensure that the PMG estimates are preferred to the ones obtained from the Mean Group (MG) estimator. The MG estimator fits the model separately for each group. The Hausman test provides evidence that PMG estimates are preferred since we fail to reject the hypothesis that the difference in coefficients is not systematic for the full sample. The test statistic for the parameters (joint test) is equal to 7.06, with a probability of 0.22. Thus, the homogeneity restriction is not rejected jointly for all parameters. Furthermore, the condition for the error-correction speed of adjustment is met in all the estimations, where ϕ_i is statistically significant with a negative value greater than -2. Estimations were also performed without Haiti and Trinidad and Tobago since it could be argued that these 2 countries do not share the common characteristics of the rest of the sample. Results are the same when these countries are excluded.

From the estimates shown in Table 5, we can observe that the lag of the dependent variable is not statistically significant. This can lead us into questioning whether the dynamic model panel approach, where the lagged dependent variable is included as a regressor, is the adequate model. A lag length test provides evidence that one lag of the financial development growth indicator is the adequate number of lags.¹⁶

In Table 5, Model 2 (columns 3 and 4) shows the estimates obtained when a composite index of country risk is included. This country risk index has a significant positive effect on financial development at the 5 percent level. Thus, as country risk decreases (index increases) financial development increases. Model 3 (columns 5 and 6) presents the estimates obtained when the components of the country risk index (economic, financial and political risk indices) are included. These estimates show that only the political risk index has a positive significant effect on financial development. This finding suggests that a decrease on political risk (increase in the index) is beneficial for finance.

The model specified in Equation 4 is estimated with the 12 components of the political risk index, where they are entered into the model one at the time to avoid multicollinearity issues.¹⁷ The components of the political risk index are closely related to institutions and country stability. The indicators that account for institutions that affect the economy as a whole and that are included in the political risk index are: corruption, law and order, and bureaucratic quality. Investment profile index seems to be the indicator that accounts for institutions that directly affect the financial sector since it is composed by indicators related to contract viability, expropriation, profits repatriation, and payment delays. It is expected that there is a close relationship between the investment profile index

¹⁶ Lag length selected using the ADF regressions, where the regression that minimizes the AIC is chosen (in a panel set up).

¹⁷ See Table 1 for a description of the components of the political risk index.

and our financial development indicator since investment profile will be related to investment risk and consequently to the willingness to invest in a specific country. Thus, there is an important feedback between these two indicators, and it is hoped that the AB estimator allows for estimating the independent effect of financial sector institutions on financial development. Other indicators related to country stability that compose the political risk index are government stability, internal and external conflict, religious and ethnic tensions, and democratic accountability.

Four components came out statistically significant when the model is estimated by including each component of the political risk index one at the time, and the estimates are shown in Table 6.¹⁸ Law and order and government stability have a positive significant effect on financial development at the 5 and 1 percent level, respectively. Investment profile and internal conflict have a marginally significant effect on financial development (10 percent level).¹⁹ From these estimations we can conclude that from the different indicators that relate to institutions, law and order is the one that is relevant for the development of the financial sector. Additionally, when looking at different indicators that relate to country stability, government stability is the one that matters the most for financial development.

In this analysis it is important to note that trade openness has a negative effect and it is insignificant in most cases (it is significant only at the 10 percent level in two out of six cases). In relation to openness, financial openness seems to be the key player in explaining

¹⁸ Estimates are shown only for those estimations in which the component of the political risk index is significant. Other estimations that include the other components of the political risk index, one at the time, are not included for purpose of space but are available upon request.

¹⁹ Note that in all the estimations the Sargan test shows that the instruments used are valid since we fail to reject the hypothesis that the overidentifying restrictions are valid. The serial correlation tests also show that the idiosyncratic errors are independently and identically distributed (i.i.d) as required for the AB estimation. In all AB estimations but one, we meet the conditions of rejecting first order autocorrelation and failing to reject second order autocorrelation at the 5 percent level.

financial development in Latin America. A possible explanation of this finding is the sample period used. This analysis includes the period of 1990-2007 in most cases, which is a period where financial markets experienced opened up significantly. In fact, the standard deviation for the index of financial openness is more than double the standard deviation of the trade openness indicator.

VI. Conclusion

In the analysis of the impact of financial development on economic growth, there are two main findings. First, there seems to be evidence that financial development has a positive effect in the long run, but a negative effect in the short run for the Latin American region. This finding is relevant as it might relate to the financial crises experienced in the Latin American region in the last couple of decades. This analysis provides evidence that financial development might bring some instability that leads to lower economic growth in the short run. Nonetheless, financial development seems to be associated with positive economic growth in the long run, which should be considered when designing policies that promote economic growth in Latin America.

Second, the estimation results obtained when the sample is separated by income groups corroborate previous findings related to the fact that the effect of financial development is dependent on certain conditions. This fact must also be taken into consideration when policies that aim to promote economic growth through developing the financial sector in the Latin American region are designed. Promoting the deepening of financial markets seems to be beneficial for high income groups, but not for low income groups. Therefore, financial reform should be a priority for those countries with relatively

higher income levels in Latin America, but not for all. For further research, disentangling what conditions allow the relatively high income group to reap benefits from financial development in the long run is necessary. Perhaps preconditions related to institutions or certain financial development threshold might be relevant.

From the study of the determinants of financial development in Latin America, the main findings can be summarized as follows. Financial openness seems to be playing a key role on the development of financial markets in Latin America, where it has a robust positive significant effect of great magnitude. The analysis here provides evidence showing that financial openness will benefit the most, in terms of improving financial markets, those countries that are relatively closed. Thus, those countries with trade restrictions will find that liberalizing capital accounts can lead to significant expansions of credit.

This analysis shows that country risk, in relation to political risk, is also an important source of finance in the region. In specific, law and order and government stability seem to be important factors that affect financial development the most in Latin American countries. From this finding, we can conclude that policies that focus on promoting government stability and strengthening the legal system and its observance are relevant for improving financial markets in the region. This is an important finding for Latin America since the region has become relatively stable in the last decades. Therefore, by ensuring the strengthening of democracies and promoting stability, financial markets might be able to deepen in the future. Furthermore, ensuring that the legal system is strong and impartial and citizens observe the law, would lead to the improvement of capital markets. For further research, it will be interesting to evaluate whether there is a relationship between financial openness and institutions. Furthermore, this analysis uses an

indicator of financial openness that relates to capital account openness. Future research should consider a wider indicator of financial liberalization that accounts not only for the openness of the capital account, but also for financial reforms and deregulation of the domestic financial market.

References

- Abiad, Abdul, and Ashoka Mody. 2005. Financial Reform: What Shakes It? What Shapes It? *American Economic Review*. 95(1): 66-88.
- Abiad, Abdul, Enrica Detragiache, and Thierry Tresselt. 2010. A New Database of Financial Reforms. *IMF Staff Papers*. 57(2): 281-302.
- Acemoglu, Daron and Simon Johnson. 2005. Unbundling Institutions. *Journal of Political Economy* 113(5): 949-995.
- Aghion, Philippe, Peter Howitt, and David Mayer-Foulkes. 2005. The effect of financial development on convergence: Theory and evidence. *Quarterly Journal of Economics* 120:173–222.
- Andrianova, Svetlana, Panicos Demetriades, and Anja Shortland. 2008. Government Ownership of Banks, Institutions, and Financial Development. *Journal of Development Economics* 85(1-2): 218-252.
- Arellano, Manuel, and Stephen Bond. 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies* 58, 277–297.
- Asteriou, Dimitrios, and Stephen, Hall. 2007. *Applied econometrics: a modern approach using EViews and Microfit*. Basingstoke [England]: Palgrave Macmillan.
- Baltagi, Bad, Panicos Demetriades, and Siong Hook Law. 2009. Financial Development and Openness: Evidence from Panel Data. *Journal of Development Economics* 89(2): 285-296.
- Beck, Thorsten, Ross Levine, and Norman Loayza. 2000. Finance and the sources of growth. *Journal of Financial Economics*, 58(1-2):261–300.
- Beck, Thorsten, Asli Demirguc-Kunt, and Ross Levine. 2000. A new database on financial development and structure. *World Bank Economic Review* 14(3):597–605. Retrieved in May 2010, revised version, April 2010, online: <http://go.worldbank.org/X23UD9QUX0>
- Beck, Thorsten, Asli Demirguc-Kunt, and Ross Levine. 2003. Law, Endowments, and Finance. *Journal of Financial Economics* 70(2): 137-181.
- Beck, Thorsten and Ross Levine. 2005. Legal Institutions and Financial Development. In *Handbook of New Institutional Economics*, 251-278. Dordrecht and New York.
- Blackburne, Edward and Mark Frank. 2007. Estimation of nonstationary heterogeneous panels. *Stata Journal* 7(2):197-208.

Enders, Walter. 2004. *Applied econometric time series*, 2nd edition. New York: John Wiley and Sons.

Blanco, Luisa. 2009. The Finance–Growth Link in Latin America. *Southern Economic Journal*, 76(1): 224–248.

Caprio, Gerard and Daniela Klingebiel. 2002. Episodes of systemic and borderline financial crises. World Bank Research Domestic Finance Data Sets, Retrieved May 2010, online: <http://go.worldbank.org/5DYGICS7B0>

Chinn, Menzie and Hiro Ito. 2006. What matters for financial development? Capital controls, institutions, and interactions. *Journal of Development Economics*, 81(1):163-192.

Chinn, Menzie and Hiro Ito, 2008, A New Measure of Financial Openness, *Journal of Comparative Policy Analysis: Research and Practice*, 10(3), 309-322. Retrieved on May of 2010, online: http://web.pdx.edu/~ito/kaopen_2007.xls

De Gregorio, Jose, and Pablo Guidotti. 1995. Financial development and economic growth. *World Development* 23:433–48.

Djankov, Simeon, Caralee McLiesh, and Andrei Shleifer. 2007. Private credit in 129 countries. *Journal of Financial Economics* 84:299–329. Retrieved on May of 2010, online: <http://www.economics.harvard.edu/faculty/shleifer/dataset>

Heston, Alan, Robert Summers and Bettina Aten. 2009. Penn World Table Version 6.3, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, retrieved on May of 2010, online: <http://pwt.econ.upenn.edu/>

Herger, Nils, Roland Hodler, and Michael Lobsiger, 2008. What Determines Financial Development? Culture, Institutions or Trade. *Review of World Economics* 144(3): 558-587.

International Monetary Fund (IMF). 2010. International financial statistics. Retrieved on May 2010, online <http://www.imfstatistics.org/imf/>.

Klein, Michael, and Giovanni Olivei. 2008. Capital Account Liberalization, Financial Depth, and Economic Growth. *Journal of International Money and Finance* 27(6): 861-875.

Laeven, Luc, and Fabian Valencia. 2008. Systemic Banking Crises: A New Database. IMF Working Papers: 08/224

Levine, Ross. 2005. Finance and growth: Theory and evidence. *In Handbook of Economic Growth*, edited by Philippe Aghion and Steven Durlauf. 1A. North-Holland: Elsevier, pp. 866–934.

Loayza, Norman, and Romain Rancière. 2006. Financial development, financial fragility, and growth. *Journal of Money, Credit, and Banking* 38:1051–76.

Mayer, Thierry and Zignago, Soledad, 2006, CEPII Distance data, Centre D'Etudes Prospectives et D'Informations Internationales, online:
<http://www.cepii.fr/anglaisgraph/bdd/distances.htm>

Mishkin, Frederic. 2009. Globalization and Financial Development. *Journal of Development Economics* 89(2): 164-169.

Odhiambo, Nicholas. 2007. Supply-leading versus demand-following hypothesis: Empirical evidence from three SSA countries. *African Development Review* 19:257–80.

Pesaran, Hashem, Yongcheol Shin, and Ron Smith. 1999. Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association* 94(446): 621-634.

Political Risk Services Group (PRS). 2010. International Country Risk Guide, retrieved on May 2010, online: <http://www.prsgroup.com/>.

Rajan, Raghuram, and Luigi Zingales. 2003. The great reversals: The politics of financial development in the twentieth century. *Journal of Financial Economics* 69:5–50.

Rancière, Romain, Aaron Tornell and Frank Westermann. 2008. Financial liberalization. In Durlauf, Steven N, and Lawrence Blume. *The New Palgrave Dictionary of Economics*. Basingstoke, Hampshire: Palgrave Macmillan, Print.

Rioja, Felix, and Neven Valev. 2004a. Finance and the sources of growth at various stages of economic development. *Economic Inquiry* 42:127–40.

Rioja, Felix, and Neven Valev. 2004b. Does one size fit all? A reexamination of the finance and growth relationship. *Journal of Development Economics* 74:429–47.

Roe, Mark and Jordan Siegel. 2009. Political Instability: Its Effects on Financial Development, Its Roots in the Severity of Economic Inequality, Harvard University, Working paper.

Saint-Paul, Gilles. 1992. Technological choice, financial markets and economic development. *European Economic Review* 36:763–81.

Shen, Chung-Hua, and Chien-Chiang Lee. 2006. Same financial development yet different economic growth—Why? *Journal of Money, Credit and Banking* 38:1907–44.

Shan, Jordan. 2005. Does financial development ‘lead’ economic growth? A vector auto-regression appraisal. *Applied Economics* 37:1353–67.

United Nations Commodity Trade Statistics Database (UN COMTRADE), 2010, Retrieved on May 2010, online: <http://comtrade.un.org/>

Wooldridge, Jeffrey M. 2002. *Econometric analysis of cross section and panel data*. Cambridge, Mass: MIT Press.

Table 1. Variable description and source

	Variable description and source
Financial development	Private credit as a share of GDP. Source: Beck, Demirguc-Kunt, and Levine (2000) and Author's construction using International Financial Statistics (IMF, 2010).
GDP per capita	Real GDP per capita, Laspeyres constant prices. Source: Heston et al. (2009).
Initial GDP per capita	Initial GDP in the five year period divided by population in the actual year, (time variant, different every year). Constructed using total population and real GDP, Laspeyres constant prices. Source: Heston et al. (2009).
Government size	Government spending as a share of GDP (from real GDP Laspeyres constant prices). Source: Heston et al. (2009).
Inflation	Inflation plus 100 (in natural log). Source: Author's construction using International Financial Statistics data (IMF, 2010).
Trade	Residual of a regression of the natural log of trade openness (export plus imports divided by GDP, from real GDP Laspeyres constant prices) on the natural log of the area of the country, natural log of population, landlocked dummy, net oil exporter dummy, and time dummies. Source: Author's construction using data from Heston et al. (2009) for the trade openness indicator and population, from Mayer and Zignago (2006) for area of a country and landlocked dummy, and from UNCOMTRADE (2010) for the construction of the net exporter oil dummy (this estimation assumes oil dummy equals to zero for missing observations).
Banking crisis	Banking crisis dummy equal to 1 if a country experienced a financial crisis in that year. Source: Laeven and Valencia (2008) for initial years and Caprio and Klingebiel (2003) for duration of crisis.
Trade openness	Exports plus imports as a share of GDP (from real GDP Laspeyres constant prices). Source: Heston et al. (2009).
Financial openness	Index of capital account openness. Source: Chinn and Ito (2008).

Table 1. Variable description and source (continued)*

Variable description and source	
Country risk	Composite index of country risk. Index composed by financial, economic and political risk indices. The political risk rating contributes 50% of the composite rating, while the financial and economic risk ratings each contribute 25%.
Political risk	Composed by the following 12 components: government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucracy quality.
Financial risk	Composed by the following 5 components: foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of exports of goods and service, net international liquidity as months of import cover, and exchange rate stability.
Economic risk	Composed by the following 5 components: GDP per head, real GDP growth, annual inflation rate, budget balance as a percentage, current account as a percentage of GDP.
Law and order	The law component refers to the strength and impartiality of the legal system, and the order component relates to the assessment of popular observance of the law.
Government stability	This indicator relates to the government's ability to carry out its declared programs and its ability to stay in office. This indicator is composed by government unity, legislative strength and popular support.
Investment profile	This indicator relates to the risks to investment, where it is composed by contract viability/expropriation, profits repatriation, and payment delays.
Internal conflict	Indicator related to internal political violence and its actual or potential impact on governance. It is composed by civil war/coup threat, terrorism/Political violence, and civil disorder.

*The source for variables in this section is the Political Risk Group (2010).

Table 2. Impact of Financial Development on Growth Data – Summary Statistics

Annual observation, 1961-2007, 18 countries (statistics on time demeaned data)

	Obs.	Mean	Std.Dev.	Min	Max
ln(GDP per capita)	846	1.10E-10	0.516	-1.608	1.188
ln(Finc Dev)	846	7.19E-10	0.569	-1.969	1.315
ln(Initial GDP per cap)	846	2.60E-10	0.513	-1.591	1.125
ln(Government Size)	846	3.54E-11	0.337	-1.191	0.691
Trade	846	-1.27E-10	0.449	-1.396	1.229
Inflation	846	2.22E-10	0.359	-0.651	4.167

Table 3. Determinants of Financial Development Data - Summary Statistics

5 year average observations, 1970-2007, 18 countries

	Obs.	Mean	Std.Dev.	Min	Max
ln(Finc dev)	144	-1.555	0.565	-3.212	-0.155
ln(GDP per capita)	144	8.698	0.541	7.330	10.075
ln(Trade openness)	144	3.953	0.608	2.561	5.283
Banking crisis	144	0.108	0.230	0.000	1.000
Financial openness	144	0.320	1.452	-1.812	2.532
Trade open*Finc open	144	1.597	5.998	-7.429	13.375
Country risk	90	62.901	10.515	34.600	81.981
Financial risk	90	32.722	7.541	11.883	45.986
Political risk	90	60.239	11.454	28.383	81.167
Economic risk	90	32.745	4.783	15.817	44.486
Law and order	90	2.796	1.021	1.000	5.000
Government stability	90	6.999	1.732	2.283	9.681
Investment profile	90	6.764	2.228	1.167	11.500
Internal conflict	90	8.020	2.256	0.350	11.139

Table 4. Impact of financial development on economic growth (Pooled Mean Group Estimator)

Variables	All countries		High income countries		Low income countries	
	Coeff	Std.Error	Coeff	Std.Error	Coeff	Std.Error
<i>Long Run Coefficients</i>						
Financial Development	0.075 ***	0.018	0.090 ***	0.018	-0.081	0.062
Initial GDP per capita	0.522 ***	0.110	0.495 ***	0.112	0.122	0.280
Government Size	0.295 ***	0.076	0.272 ***	0.070	0.206 *	0.122
Trade	0.280 ***	0.060	0.317 ***	0.061	0.254 ***	0.092
Inflation	-0.059	0.038	-0.007	0.031	-0.349 ***	0.132
<i>Error-Correction Coefficient - ϕ</i>	-0.094 ***	0.034	-0.138 **	0.071	-0.079 **	0.036
<i>Short-Run Coefficients</i>						
d(GDP per capita) _{t-1}	0.151 ***	0.054	0.193 **	0.081	0.110 *	0.067
d(GDP per capita) _{t-2}	-0.013	0.040	0.054	0.044	-0.061	0.066
d(Financial development) _t	-0.040 **	0.020	-0.059 *	0.034	-0.014	0.018
d(Financial development) _{t-1}	0.003	0.014	-0.005	0.021	0.010	0.020
d(Financial development) _{t-2}	-0.022 *	0.013	-0.030 *	0.018	-0.017	0.018
d(Initial GDP per capita) _t	0.080 **	0.037	0.109 *	0.059	0.063	0.051
d(Government size) _t	-0.207 ***	0.038	-0.256 ***	0.068	-0.162 ***	0.032
d(Trade) _t	0.021	0.028	0.013	0.042	0.025	0.039
d(Inflation) _t	-0.058 ***	0.016	-0.057 **	0.024	-0.051 **	0.023
Intercept	0.002	0.010	0.029 **	0.014	-0.040	0.028
No. Countries	18		9		9	
No. Observations	792		396		396	
Log Likelihood	1778.832		891.985		894.196	

*, **, and *** indicate significance at 10, 5 and 1 percent level, respectively.

Table 5. Sources of financial development (Arellano and Bond Estimator)

Variables	Model 1		Model 2		Model 3	
	Coeff	Std.Err	Coeff	Std.Err	Coeff	Std.Error
d(Financial development growth) _{t-1}	0.097	0.112	0.063	0.131	0.055	0.144
d(GDP per capita growth) _t	0.749 ***	0.293	0.271	0.621	0.568	0.671
d(Banking crisis) _t	0.554 ***	0.206	0.366 **	0.184	0.325*	0.192
d(Trade openness) _t	-0.217	0.250	-0.606*	0.352	-0.460	0.341
d(Financial openness) _t	1.390 ***	0.455	1.152 ***	0.421	1.271 ***	0.450
d(Trade Open) _t * d(Finc Open) _t	-0.323 ***	0.106	-0.273 ***	0.096	-0.301 ***	0.101
d(Country risk) _t			0.022 **	0.009		
d(Financial risk) _t					0.006	0.010
d(Political risk) _t					0.017 ***	0.006
d(Economic risk) _t					-0.012	0.022
No. Countries	18		18		18	
No. Observations	90		72		72	
No. of time periods	5		4		4	
Sample period	85-07		90-07		90-07	
Sargan Test (p-value)	21.163	(0.10)	14.946	(0.31)	14.029	(0.37)
First order serial correl test (p-value)	-2.206	(0.03)	-2.291	(0.02)	-2.233	(0.03)
Sec. order serial correl test (p-value)	-1.784	(0.07)	-1.125	(0.26)	-1.203	(0.23)

Robust standard errors provided. *, **, and *** indicate significance at 10, 5 and 1 percent level, respectively.

Table 6. Sources of financial development (Arellano and Bond Estimator)

Variables	Model 1		Model 2		Model 3		Model 4	
	Coeff	Std.Err	Coeff	Std.Err	Coeff	Std.Err	Coeff	Std.Err
d(Financial development growth) _{t-1}	0.047	0.142	0.006	0.139	0.012	0.139	0.051	0.148
d(GDP per capita growth) _t	0.788	0.494	0.593	0.427	0.816*	0.461	0.790	0.514
d(Banking crisis) _t	0.320 *	0.191	0.364 *	0.190	0.415**	0.185	0.338 *	0.202
d(Trade openness) _t	-0.464	0.328	-0.590 *	0.341	-0.448	0.359	-0.408	0.362
d(Financial openness) _t	1.220 ***	0.395	1.465 ***	0.375	1.447 ***	0.412	1.328 ***	0.433
d(Trade Open) _t * d(Finc Open) _t	-0.277 ***	0.090	-0.347 ***	0.088	-0.340 ***	0.096	-0.309 ***	0.098
d(Law and order) _t	0.145 **	0.066						
d(Government stability) _t			0.098 ***	0.033				
d(Investment profile) _t					0.048*	0.029		
d(Internal conflict) _t							0.045*	0.026
No. countries	18		18		18		18	
No. observations	72		72		72		72	
No. of time periods	4		4		4		4	
Sample period	90-07		90-07		90-07		90-07	
Sargan Test (p-value)	16.019	(0.25)	18.441	(0.14)	16.628	(0.22)	17.389	(0.18)
First order serial correl test (p-value)	-2.13	(0.03)	-1.87	(0.06)	-2.21	(0.03)	-2.17	(0.03)
Sec. order serial correl test (p-value)	-1.50	(0.13)	-1.27	(0.20)	-1.41	(0.16)	-1.58	(0.11)

Robust standard errors provided. *, **, and *** indicate significance at 10, 5 and 1 percent level, respectively.