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## Article

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# Has the finance–growth link been broken? Panel data evidence from Latin America and the Caribbean

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## Abstract

This paper examines the two-way relationship between economic growth and financial development for Latin America and the Caribbean (LAC). The sample consists of 32 emerging and developing countries from LAC spanning the period 1970–2014. Controlling for country and time fixed effects, the first central finding indicates that financial development is not a significant factor driving economic growth. The evidence suggests however that larger government has a robust and significant effect on economic growth. The second key finding is that the effect of economic growth on financial development is not significantly different from zero. Together, these two main findings indicate that the finance–growth link in LAC has been broken over the 1970–2014 period. The empirical results inform economic debates in LAC and highlight the importance of public policy to improve the finance–growth relationship.

*JEL classifications:* N16; O11; G21

*Keywords:* Financial development; Economic growth; LAC

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## 1. Introduction

The Latin America and the Caribbean (LAC) region has been affected by frequent boom and bust cycles. Since the early 1980s, however, economic growth in the region has been on an upward trend. Fig. 1 illustrates this general pattern. As policy-makers in the region work to improve their economies, reforms have been implemented to cope with economic and financial shocks. These reforms enabled many countries in LAC to dampen the effects of the 2008–2009 global financial crisis. Fig. 1 also shows that financial deepening has improved dramatically, especially since the 1990s, though it remains below East Asia and other emerging economies (Didier and Schmukler, 2014).

One of the most important empirical regularities in the economic literature is the relationship between economic growth and financial development. Although there is a large literature that examines the impact that financial development has on economic growth, not much is known about the finance–growth link in LAC. The LAC region has implemented radical financial reforms in the 1970s, 1980s, and the early 1990s (Diao et al., 2017); and the strong growth performance over the 2004–2013 period causes economists to refer to this period as the “Latin American

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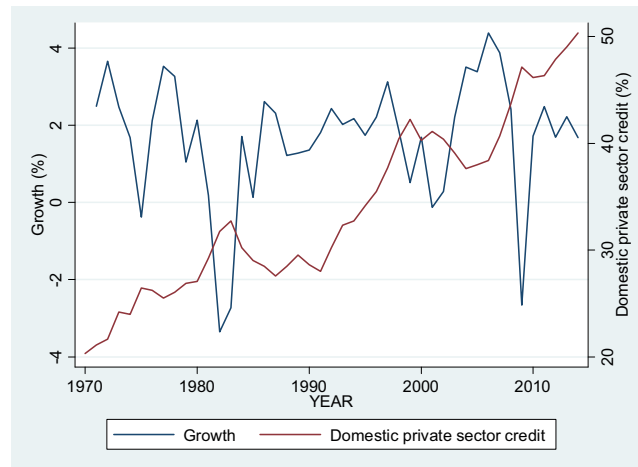


Fig. 1. Evolution of growth and domestic private sector credit in LAC.

Notes: Author's calculation based on WDI and World Bank Financial Development and Structure database. Data are annual averages.

Decade” (Ocampo, 2015). In light of these financial reforms undertaken by LAC and the debate arising from the 2008 to 2009 global financial crisis that casts doubt on the role of financial development in economic development, understanding the relationship between economic growth and financial development is an important policy issue for both policy-makers in Latin America and the Caribbean and international agencies that are assisting developing and emerging economies to improve economic outcomes.

To shed light on this central policy concern, this paper estimates the two-way relationship between financial development and economic growth using panel data on 32 countries from LAC over the 1970–2014 period. In the first stage, I estimate the link from financial development to economic growth. In a second step, I address the effect from economic growth to financial development. The panel data approach allows to control for time-invariant country-level characteristics that can bias estimates on the relationship between financial development and economic growth. A further issue is the possibility of endogeneity bias arising from reverse causality. The empirical strategy relies on the Blundel and Bond (1998) system-GMM dynamic panel estimator to address reverse causality associated with ordinary least squares estimation.

The first main finding from the panel data analysis suggests that financial development does not significantly promote economic growth in LAC. This finding is consistent with Lucas (1988) who argues that the role of finance in economic development is “over-stressed” and Manning (2003) who questions whether “finance causes growth: can we be so sure?” and Rousseau and Wachtel (2011) who document that the significant impact of financial development on economic growth disappears post-1980s. The empirical evidence suggests however that the primary and most robust factor that can increase LAC’s economic growth is lower government consumption. The second main finding is that economic growth is not a significant determinant of financial development in LAC. Instead, the evidence presented in this paper surprisingly suggests that inflation is positively and significantly related to financial development in LAC. This latter finding does not support Aggarwal et al. (2011) who show, in a larger sample comprising 109 countries, that inflation distorts financial intermediation. The finding that the effect of economic growth on financial development is not significantly different from zero does not support Robinson’s (1952) view that “where enterprise leads, finance follows.”

These findings are robust to using the Arellano and Bond (1991) first differences GMM dynamic panel estimator and the Blundel and Bond (1998) system-GMM dynamic panel estimator. Fig. 2 shows a scatterplot with real per capita GDP growth on the vertical axis and domestic private sector credit on the horizontal axis, both averaged over 5 years. The graph supports the more rigorous econometric evidence that there is no significant association between financial development and economic growth.<sup>1</sup>

<sup>1</sup> Similar results are obtained when the data are averaged over 2-year and 3-year periods. These results are not reported to save space but are available from the author upon request.

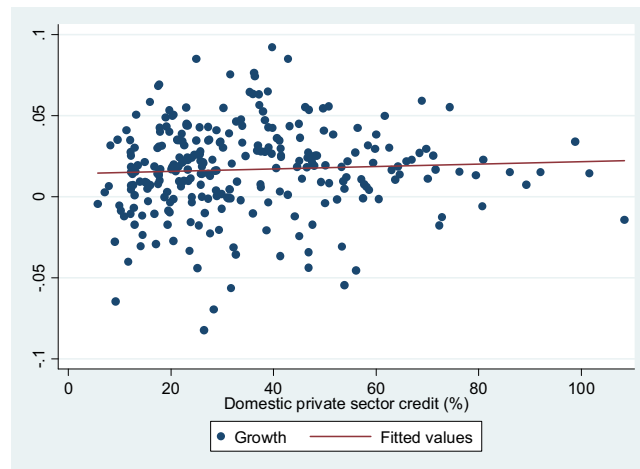


Fig. 2. Correlation between domestic private sector credit and growth.

Notes: Real GDP per capita growth and domestic private sector credit provided by banks and other financial institutions divided by GDP. Data are 5-year averages over 1970–2014 based on WDI and World Bank Financial Development and Structure database.

Financial development is expected to boost economic development through a number of growth-enhancing channels. By lowering the cost associated with information gathering, monitoring firms and exercising corporate control, allocating risks more efficiently, pooling of savings, and facilitating exchanges of goods and services, a developed financial system facilitates the flow of financial resources to their most profitable uses (Levine, 2005). These growth-enhancing features of financial development are consistent with Shumpeter's (1911) view that financial development is an essential part of overall economic development. An opposing view put forward by Robinson (1952) is that economic growth generates more opportunities for financial intermediaries to emerge, because in a growing economy individuals and firms seek more financial services. Greenwood and Jovanovic (1990) models the dynamic interplay between financial development and economic growth. In their model, the financial system provides better information about the economic environment. This improved information ensures more efficient allocation of finance that raises growth. Growth in turn reduces the costs of accessing the financial system and fosters demand for financial products. These two views suggest a two-way relationship between economic growth and financial development.

There are relatively few published papers on the finance–growth relationship in LAC (Bittencourt, 2012; De Gregorio and Guidotti, 1995; Iyare and Moore, 2011; Nazmi, 2005). Using time series data for the period 1980–2007, Bittencourt (2012) examines the effect of financial development on economic growth for four Latin American countries: Argentina, Bolivia, Brazil, and Peru. After controlling for endogeneity and a set of control variables, the author shows that financial development is positively and significantly related to economic growth. The finding is confirmed using different estimators including instrumental variables estimation.

In contrast, using a sample of 12 Latin American countries for the period 1950–1980, De Gregorio and Guidotti (1995) find that financial development has a significant negative effect on economic growth. They attribute this negative effect to liberalization of financial markets in the 1970s and 1980s without the appropriate regulations. Their estimation strategy is based on ordinary least squares. Iyare and Moore (2011) use a time series method over the period 1960–2003 to examine the relationship between financial development and economic growth in three Caribbean countries, as well as Singapore. They find mixed evidence. Economic growth has a significant effect on financial development in Jamaica and Singapore; financial development has a significant effect on economic growth in Trinidad and Tobago; and there is a bidirectional relationship in Barbados. Nazmi (2005) develops a theoretical model showing that financial development and deregulation improve economic growth. The author tests the model's predictions using a sample of 5 Latin American countries for the period 1960–1995. Using ordinary least squares estimation, the results indicate that financial development has a significant positive effect on economic growth and the impact of deregulation is negative.

Though this paper investigates the finance–growth relationship in LAC, relative to the above papers, the main contribution of the current paper is to present novel evidence that the finance–growth relationship has been broken over the 1970–2014 period. The broken link arises from the lack of a significant association between economic growth and financial development. In the context of the current active debate questioning the growth effect of financial develop-

ment, this new evidence is a major departure from previous studies on LAC which show that financial development significantly improves economic growth (Bittencourt, 2012; Iyare and Moore, 2011; Nazmi, 2005) and at the same time financial development significantly reduces economic growth (De Gregorio and Guidotti, 1995) or that economic growth significantly improves financial development (Iyare and Moore, 2011). From a policy perspective, this paper provides an improved understanding of the relationship between financial development and per capita GDP growth in LAC.

The paper proceeds as follows. Section 2 discusses the relevant literature. Section 3 describes the estimation strategy and data. Section 4 presents the empirical results. Section 5 contains a discussion of potential reasons of the broken link between economic growth and financial development. And Section 6 concludes.

## 2. Related literature

Pioneering works by Shumpeter (1911), Goldsmith (1969), McKinnon (1973), and Shaw (1973) are the first to highlight the positive role of finance in economic development. Starting with King and Levine (1993) in the early 1990s, a stream of empirical studies examines the connection between the financial system and economic development. In their seminal contribution, King and Levine (1993) use cross-country data to establish a robust positive effect of financial development on per capita GDP growth. Using more robust estimators, subsequent studies confirm the evidence in King and Levine (1993). Levine et al. (2000) use the system-GMM dynamic panel estimator to also estimate the impact of finance on growth. Their results are consistent with a significant positive effect of finance on growth. Beck and Levine (2004) also show that the banking sector and financial markets improve economic growth.

In contrast, other cross-country studies cast doubt on the positive effect of finance. Rioja and Valev (2004), for example, argue that the effect of financial development varies with the level of financial development. They show in their panel data that countries with relatively low levels of financial development benefit less from further improvements in the financial system. Rousseau and Wachtel (2011) also document a diminishing effect of finance on economic growth after the 1980s. They find this weakening effect of finance is explained by financial crises, that is, financial crises dampen the effect of finance on growth.

Following the 2008–2009 global financial crisis, an emerging literature shows that beyond certain thresholds finance can also have adverse effects on economic growth. This literature is based on the idea that a dysfunctional financial system allocates financial resources inefficiently, resulting in negative effects on economic growth. Law and Singh (2014) use a dynamic threshold estimator in a sample of 87 developed and developing countries over 1980–2010 and find evidence of a threshold effect for finance in the finance–growth relationship. Their threshold is around 88–99% of GDP depending on the finance indicator. Arcand et al. (2015) provide evidence for a threshold effect of finance of 80–120% of GD Cecchetti and Kharroubi (2012) turning point at which finance has adverse effects on economic growth approaches 100% of GDP. The evidence from these studies is consistent with the “vanishing effect” of financial sector development.

Though this paper joins the rich tradition of the finance literature, a major advantage however of the current paper over the above studies is to document that there is no statistically significant association between financial development and economic growth in LAC, indicating a delinking of the relationship between finance and economic growth. This possibility of a broken link between financial development and economic growth has so far given little attention. Additionally, none of the above studies focuses on LAC. Focusing on the LAC region has several attractive features. The LAC region, for example, implemented some of the deepest financial and economic reforms since the 1970s. Although economic growth is erratic, LAC has experienced significant economic and social improvements during the decade of the 2000s; the region also fared well during the Great Recession of 2008–2009, experienced mild setback and strong recovery. Furthermore, evidenced by the few published studies, not much emphasis is placed in the literature on the finance–growth link in LAC, which is an important policy question for this region.

## 3. The empirical strategy and data

In this section, I describe the empirical strategy use to estimate the two-way relationship between per capita GDP growth and financial development, first with the link from financial development to economic growth and then the reverse link from economic growth to financial development. I also describe the data use in the empirical analysis and present descriptive statistics. The empirical analysis uses non-overlapping 5-year averaged unbalanced panel data on

32 LAC countries<sup>2</sup> over the 1970–2014 period. Each country has a maximum of 9 observations per variable when available: 1970–1974, 1975–1979, . . . , 2010–2014. This period captures all the major economic and financial reforms in the LAC region and the so-called Latin American decade, 2004–2013. The 5-year averaged panel data smooth cyclical variations associated with annual data and thus make inferences more reliable.

### 3.1. From financial development to economic growth

The paper builds on the works of [Beck and Levine \(2004\)](#) and [Bittencourt \(2012\)](#) and estimates the following growth model that relates the change in the natural logarithm of real per capita GDP between time  $t - 1$  and  $t$  to financial development and a set of growth control variables  $X$ :

$$\Delta \ln Y_{it} = a_i + d_t + \beta \ln Y_{it-1} + \gamma \ln FD_{it-1} + \delta \ln X_{it-1} + \varepsilon_{it}, \quad (1)$$

where  $\Delta \ln Y_{it}$  is time  $t - 1$  to  $t$  change in the natural logarithm of real per capita GDP in country  $i$ . The  $a_i$  are country fixed effects that control for country-specific characteristics, for example cross-country differences in history, geography, ethnicity and other omitted time-invariant factors that affect economic growth. The  $d_t$  are time fixed effects that absorb time-specific shocks to economic growth, such as global business cycles and other global political events, such as the end of the Cold War. The convergence term  $\ln Y_{it-1}$  is the natural logarithm of initial real per capita GDP. The main measure of financial development  $FD_{it-1}$  is the natural logarithm of the ratio of domestic private sector credit to GDP provided by banks and other financial institutions. Previous studies that use this measure include [King and Levine \(1993\)](#), [Arcand et al. \(2015\)](#), [Rioja and Valev \(2004\)](#), and [Levine et al. \(2000\)](#). This measure is justified because a financial sector that lends to private firms rather than governments is more likely to promote economic growth, because it exerts better corporate oversight and risk mitigation strategies ([Arcand et al., 2015](#)).

As robustness checks against the main indicator, the paper uses domestic private sector credit divided by GDP provided by deposit banks only and liquid liabilities divided by GDP. These alternative measures of financial development do not change the main finding that there is no significant relationship between financial development and economic growth. The paper uses these bank based measures because the banking system is the main source of intermediation between savers and investors in developing countries ([Levine and Zervos, 1998](#); [Levine, 2002](#)). The vector  $X_{it-1}$  includes the natural logarithms of the growth determinants: trade openness as measured by the sum of exports and imports divided by GDP captures external competitiveness and trade liberalization ([Sachs and Warner, 1995](#)); inflation as measured by consumer price index and total government consumption divided by GDP capture macroeconomic instability ([Easterly and Rebelo, 1993](#)); secondary school enrolment is a proxy for human capital ([Barro, 1991](#)); and the population growth rate is included in line with the standard Neoclassical prediction of the Solow-growth model ([Mankiw et al., 1992](#)).<sup>3</sup> The growth determinants are from the World Bank World Development Indicators and the financial development indicators are from the World Bank Financial Development and Structure online database.

There are two important econometric issues estimating Eq. (1). The first concern is endogeneity bias arising from reverse causality between economic growth  $\Delta \ln Y_{it}$  and the right-hand side variables, in particular the variable of interest,  $FD_{it-1}$ . The second issue is the [Nickell \(1981\)](#) bias arising from the correlation of the lagged dependent variable  $\ln Y_{it-1}$  and the error term  $\varepsilon_{it}$  in a dynamic panel. Notice that I lagged the growth determinants and the financial development indicator one period (5-year lag) to reduce concern about reverse causality. It is possible that economic growth  $\Delta \ln Y_{it}$  in period  $t$  affects financial development  $FD_{it-1}$  in period  $t$ , but it is unlikely that financial development 5 years ago would be responding to current economic growth ([Jaremski and Fishback, 2017](#)).

I more rigorously address reverse causality using the [Blundel and Bond \(1998\)](#) system-GMM dynamic panel estimator to estimate Eq. (1). I treat the financial development indicator  $FD_{it-1}$  and the vector of growth determinants

<sup>2</sup> These countries are: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Costa Rica, Columbia, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, and Venezuela. 5-year averages smooth cyclical fluctuations associated with shorter time-periods. This is the standard approach in the literature on growth and finance ([Levine et al., 2000](#); [Beck and Levine, 2004](#); [Rioja and Valev, 2000](#); [Rousseau and Wachtel, 2011](#); [Arcand et al., 2015](#); [Williams, 2018](#)).

<sup>3</sup> Trade openness and human capital are expected to improve economic growth. In contrast, inflation, government consumption, and population growth are expected to negatively affect economic growth.

$X_{it-1}$  as endogenous in the system-GMM dynamic panel estimator.<sup>4</sup> Following [Klomp and de Haan \(2015\)](#), robust standard errors are computed with the [Windmeijer \(2005\)](#) finite sample correction. I report the p-values of the Hansen test and the AR(2) test as checks on the validity of the internal instruments.

I use an alternative method to estimate Eq. (1): the [Arellano and Bond \(1991\)](#) first differences GMM dynamic panel estimator. It is well known however that the first differences GMM dynamic panel estimator suffers from the weak instrument problem. It nevertheless provides a useful check on the more sophisticated system-GMM dynamic panel estimator.

Ideally, however, identifying the causal effect of financial development requires an external instrument that isolates the exogenous variation in financial development. An important line of recent research uses quasi-natural experiments to estimate the link between financial development and economic development ([Levine et al., 2017](#); [Pierce and Snyder, 2018](#)). [Levine et al. \(2017\)](#) show that the number of slaves exported from 51 African countries between the 1400–1900 period influences the level of private sector and household credit in those countries today. They also explore mechanisms linking financial development to the slave trade. Similarly, [Pierce and Snyder \(2018\)](#) reported that the slave trade in Africa increases obstacles to accessing finance through formal and informal channels for firms in African countries. The African slave trade therefore creates distrust in Africa. Although it is an interesting idea to use historical events to estimate the causal effect of financial development on economic growth, unfortunately, the panel data and the small sample size of the current paper makes this approach unlikely. Nevertheless, a plausible alternative is the system-GMM. Furthermore, the paper addresses potential omitted variables concern by including the full set of growth determinants in the regressions and the time fixed effects control for historical shocks. This empirical setting makes progress in estimating the connection between financial development and economic growth.

### 3.2. From economic growth to financial development

Skeptical of the view that economic growth responds to financial development, [Robinson \(1952\)](#) argues instead that the financial system evolves to provide financial services as a result of demands created by economic growth. From this perspective, financial development is a by-product of economic growth. Endogenous growth models also emphasize that financial development emerges endogenously from a growing economy ([Greenwood and Jovanovic, 1990](#)), that is, when the real economy expands it pulls more people into productive activities. These productive activities in turn create incentives for financial institutions to be created. These theoretical predictions therefore suggest that financial development should follow economic growth, rather than financial development driving economic growth.

This subsection presents the data and the econometric model that I use to estimate the reverse link from economic growth to financial development in LAC. Following [Aggarwal et al. \(2011\)](#) and [Gupta et al. \(2009\)](#),<sup>5</sup> I estimate different variants of the following dynamic panel model:

$$\ln\text{FD}_{it} = \lambda_i + \alpha_t + \rho \ln\text{FD}_{it-1} + \pi \Delta \ln Y_{it-1} + \mu \ln Z_{it-1} + v_{it}, \quad (2)$$

where  $\ln\text{FD}_{it}$  is again the natural logarithm of the ratio of domestic private sector credit to GDP provided by banks and other financial institutions in country  $i$  at time  $t$ . Since the financial sector evolves slowly, I include the lagged dependent variable  $\text{FD}_{it-1}$  as a regressor to control for persistence in financial development ([Aggarwal et al., 2011](#)). The  $\lambda_i$  and  $\alpha_t$  are country and time fixed effects, respectively, describe above. Real per capita GDP growth  $\Delta \ln Y_{it-1}$  is the change in the natural logarithm of real per capita GDP between time  $t-1$  and  $t$ . The natural logarithms of the financial development determinants are included in the vector  $Z_{it-1}$ . Per capita GDP is included to capture legal institutions and economic development; rich countries are better able to pay the costs associated with setting up the financial system ([Djankova et al., 2007](#); [La Porta et al., 1997](#)). Inflation is included to capture distortions in financial intermediation ([Boyd et al., 2001](#)). Trade openness as measured by the ratio of exports to GDP is included to capture the inflows of revenues into the financial system ([Williams, 2016](#)). Studies found that remittances promote financial

<sup>4</sup> The system-GMM dynamic panel estimator combines in a system the equation in levels with the equation in first differences and use lagged levels to instrument the equation in first differences and lagged first differences to instrument the equation in levels. The system-GMM dynamic panel estimator also models the dynamics of the lagged dependent variable and thus controls for the [Nickell \(1981\)](#) bias.

<sup>5</sup> [Aggarwal et al. \(2011\)](#) and [Gupta et al. \(2009\)](#) estimate the effect of remittances on financial development in, respectively, developing countries and Sub-Saharan Africa using a similar model. I extend their model by including economic growth as the variable of interest on the right-hand side.

Table 1  
Descriptive statistics.

| Variables                                | Mean     | Std. Dev. | Obs. |
|--|----------|-----------|------|
| Private sector credit/GDP (%)            | 34.188   | 19.431    | 281  |
| (Exports + imports)/GDP (%)              | 77.147   | 39.032    | 269  |
| Inflation                                | 45.912   | 40.022    | 272  |
| $\Delta \ln$ (real per capita GDP)       | 0.017    | 0.027     | 274  |
| Gov. consumption to GDP (%)              | 13.908   | 4.888     | 266  |
| Population growth (%)                    | 1.446    | 0.935     | 288  |
| Secondary school enrolment (%)           | 66.336   | 24.671    | 255  |
| Exports/GDP (%)                          | 35.422   | 18.277    | 269  |
| Remittances/GDP (%)                      | 3.597    | 4.601     | 220  |
| Real per capita GDP (constant 2010 US\$) | 6115.755 | 4605.92   | 274  |

development (Aggarwal et al., 2011). I include remittances as a share of GDP to capture the large and persistent capital inflows to LAC.

I estimate Eq. (2) with the Arellano and Bond (1991) first differences GMM dynamic panel estimator and the Blundel and Bond (1998) system-GMM dynamic panel estimators. Note that, as in Eq. (1), I lagged all regressors in Eq. (2) and treat them as endogenous in both the system-GMM and the first differences GMM dynamic panel estimators in order to reduce simultaneity bias. The additional data are also from the World Bank World Development Indicators. Table 1 reports descriptive statistics for all the variables.

#### 4. Results

In this section, I first present estimates of the response of real per capita GDP growth to variations in financial development corresponding to Eq. (1). I then present estimates of the response of financial development to variations in real per capita GDP growth corresponding to Eq. (2).

##### 4.1. The response of economic growth to financial development

Table 2 shows the baseline estimates of the effect that lagged log domestic private sector credit divided by GDP provided by deposit banks and other financial institutions has on economic growth for the entire sample period, 1970–2014. Table 2 also displays estimates for four sub-periods – 1970–1999, 1970–2004, 1970–2009, and the so-called LAC decade 2004–2013 – which allows to assess the effect of period-specific sample selection. The estimates are computed with first differences GMM (D-GMM) and system-GMM (S-GMM) dynamic panel estimators. Table 2 therefore investigates the impact of financial development on economic growth using different econometric tools and time-periods. Looking across the different time-periods and econometric procedures, the estimated coefficient on lagged log domestic private sector credit is statistically insignificant at convention significance levels.

Columns 1–2 of Table 2 report estimates for the sub-period 1970–1999. The estimated coefficient on the convergence term, lagged log per capita GDP, is negative and significant at the 5% significance level across model specifications. Government consumption is the only growth determinant that is consistently negative and significant at conventional levels. Using column 2 as the preferred model specification, the quantitative impact of government consumption is that a 10% increase in government spending reduces economic growth on average 0.32%. Importantly, the estimated coefficient on lagged log domestic private sector credit (0.019, standard error = 0.016) is positive in column 2, though statistically insignificant. Notice the small standard errors on the estimated coefficient of domestic private sector credit, indicating that the coefficient on domestic private sector credit is precisely estimated.

Moving to sub-period 1970–2004, columns 3–4, the estimated coefficient on lagged log trade is now statistically significant at least at the 10% significance level. Quantitatively, a 10% increase in trade increases economic growth on average 0.34%. The estimated coefficient on domestic private sector credit remains positive and statistically insignificant. Turning to sub-period 1970–2009, columns 5–6, there is no evidence that financial development as measured by domestic private sector credit is significantly associated with economic growth. Note that in columns 5–6, the estimates are not driven by the 2008–2009 global financial crisis or other global events. The time fixed effects  $d_t$  wash out any



Table 2  
Effect of domestic private sector credit by banks and other financial institutions on economic growth.

|  | 1970–1999            |                     | 1970–2004            |                   | 1970–2009            |                    | 2004–2013           |                    | 1970–2014            |                    |
|--|----------------------|---------------------|----------------------|-------------------|----------------------|--------------------|---------------------|--------------------|----------------------|--------------------|
|  | D-GMM (1)            | S-GMM (2)           | D-GMM (3)            | S-GMM (4)         | D-GMM (5)            | S-GMM (6)          | D-GMM (7)           | S-GMM (8)          | D-GMM (9)            | S-GMM (10)         |
| Dependent variable: real per capita GDP growth |                      |                     |                      |                   |                      |                    |                     |                    |                      |                    |
| lnPer capita GDP, (t – 1)                      | –0.108***<br>(0.016) | –0.046**<br>(0.018) | –0.090**<br>(0.015)  | –0.027*(0.013)    | –0.093***<br>(0.017) | –0.069*<br>(0.034) | –0.123**<br>(0.007) | –0.014<br>(0.010)  | –0.083***<br>(0.013) | –0.030*<br>(0.015) |
| lnPrivate credit, (t – 1)                      | 0.010 (0.007)        | 0.019 (0.016)       | 0.007 (0.004)        | 0.008 (0.010)     | 0.010 (0.006)        | 0.010 (0.021)      | –0.100**<br>(0.049) | 0.022 (0.061)      | 0.002 (0.004)        | –0.009<br>(0.016)  |
| lnTrade, (t – 1)                               | 0.019 (0.011)        | 0.048 (0.029)       | 0.026**<br>(0.010)   | 0.034 (0.019)     | 0.032***<br>(0.011)  | –0.005<br>(0.020)  | 0.060 (0.044)       | –0.044*<br>(0.025) | 0.024***<br>(0.009)  | 0.046*<br>(0.026)  |
| lnInflation, (t – 1)                           | 0.036 (0.036)        | –0.058<br>(0.018)   | 0.020 (0.028)        | –0.118<br>(0.074) | 0.0001 (0.026)       | 0.033 (0.083)      | 0.111 (0.184)       | –0.116<br>(0.140)  | 0.031 (0.025)        | –0.065<br>(0.078)  |
| lnGovernment con., (t – 1)                     | –0.049***<br>(0.017) | –0.032*<br>(0.019)  | –0.026***<br>(0.008) | –0.002<br>(0.023) | –0.019**<br>(0.007)  | –0.011<br>(0.034)  | –0.038<br>(0.043)   | –0.053*<br>(0.030) | –0.013**<br>(0.006)  | 0.021<br>(0.027)   |
| lnEducation, (t – 1)                           | 0.005 (0.016)        | 0.101* (0.051)      | –0.001<br>(0.014)    | –0.023<br>(0.038) | 0.003 (0.018)        | –0.007<br>(0.041)  | 0.004 (0.080)       | –0.016<br>(0.107)  | 0.001 (0.013)        | 0.089<br>(0.051)   |
| lnPopulation growth, (t – 1)                   | 0.010* (0.005)       | 0.009 (0.015)       | 0.011**<br>(0.005)   | 0.001 (0.010)     | 0.010**<br>(0.005)   | –0.002<br>(0.018)  | –0.014<br>(0.080)   | –0.012<br>(0.053)  | 0.006 (0.005)        | –0.0002<br>(0.021) |
| Year FE  | Yes                  | Yes                 | Yes                  | Yes               | Yes                  | Yes                | Yes                 | Yes                | Yes                  | Yes                |
| Country FE                                     | Yes                  | Yes                 | Yes                  | Yes               | Yes                  | Yes                | Yes                 | Yes                | Yes                  | Yes                |
| AR(2), test                                    | 0.39                 | 0.78                | 0.78                 | 0.94              | 0.71                 | 0.66               | 0.21                | 0.21               | 0.76                 | 0.48               |
| Hansen test                                    | 1.00                 | 0.62                | 1.00                 | 1.00              | 1.00                 | 1.00               | 0.99                | 1.00               | 1.00                 | 0.90               |
| Observations                                   | 89                   | 118                 | 110                  | 114               | 133                  | 149                | 67                  | 77                 | 162                  | 179                |

Notes: This table reports estimates of the effect of private sector credit by deposit banks and other financial institutions on economic growth. Estimates in columns 1, 3, 5, 7, and 9 are based on the [Arellano and Bond \(1991\)](#) first differences GMM (D-GMM) dynamic panel estimator and robust standard errors. Estimates in columns 2, 4, 6, 8, and 10 are based on the [Blundel and Bond \(1998\)](#) system-GMM (S-GMM) dynamic panel estimator and robust standard errors are computed with the [Windmeijer \(2005\)](#) finite sample correction. Period 2004–2013 captures the so-called LAC decade. AR(2) and Hansen tests are p-values for second order serial correlation and instrument relevance, respectively. \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively. All control variables are treated as endogenous in the first differences and system-GMM.

bias arising from region-wide shocks, such as global business cycle effects, that may confound the effect of financial development on economic growth.

Columns 7–8 report estimates on the period that is often referred to as the Latin American decade, 2004–2013, a period during which the region grew on average 4.5%. Even during this period of exceptional growth, financial development does not appear to boost economic growth; the estimated coefficient on private sector credit is again statistically insignificant in the more reliable system-GMM specification (estimate = 0.022, standard error = 0.016). In the least-preferred first differences specification D-GMM (column 7), if anything, the estimated coefficient on domestic private sector credit (estimate = -0.100, standard error = 0.049) turns negative and quantitatively small as well. These results do not support [Bittencourt \(2012\)](#), who finds a positive effect of financial development on economic growth. Finally, columns 9–10 capture the entire sample period. Here the estimated coefficient on private sector credit remains statistically insignificant. Trade and government consumption continue to be positive and significant and negative and significant, respectively. The AR (2) test shows no evidence of second order serial correlation, although the high p-values of the Hansen test suggest over-fitting of the model.<sup>6</sup> Nonetheless, the main conclusion from [Table 2](#) is that financial development has no significant effect on economic growth, while government consumption has a significant negative effect on economic growth.

The baseline results in [Table 2](#) are robust to using different measures of financial development and a sub-sample based on the major economies in the LAC region. From a policy perspective, evidence of the impact of financial development on economic growth is more relevant for these larger economies.<sup>7</sup> [Table 3](#) has the same structure as [Table 2](#), but now I focus on these larger economies. The main independent variable is lagged log domestic private sector credit divided by GDP provided by deposit banks and other financial institutions. Moving down each column in [Table 3](#) including the LAC decade, 2004–2013, we see that only the estimated coefficients on government consumption and the convergence variable have statistically significant effect on economic growth. Notably, in these larger economies private sector credit is not significantly associated with economic growth. The results in [Table 3](#) are broadly similar to the baseline estimates in [Table 2](#).

In [Table 4](#), I use an alternative measure of financial development: domestic private sector credit divided by GDP provided by deposit banks only. In [Table 5](#), I use liquid liabilities divided by GDP. Both measures are commonly used in the finance literature to assess the effect of financial development on economic growth ([Beck and Levine, 2004](#); [Bittencourt, 2012](#)). Both tables taken together, these alternative measures of financial development never had a statistically significant positive effect on economic growth. Note again that the standard errors on the estimates of both measures of financial development are relatively small. This suggests that the lack of a statistically significant effect of financial development on economic growth is not due to imprecise estimates. Overall, this finding supports previous research that casts considerable doubt on the conventional view that financial development is a strong predictor of economic growth ([Lucas, 1988](#); [Manning, 2003](#); [Rousseau and Wachtel, 2011](#)). As in [Table 2](#), government spending is the most robust determinant of economic growth. Hence reducing government consumption is one way of improving economic growth in LAC. Similar to [Table 2](#) (column 7) for the LAC decade 2004–2013, with the first differences GMM, the corresponding estimate for financial development in [Table 4](#) (column 7) is negative and statistically significant. With the more robust system-GMM, the financial development indicator is however insignificant.

#### 4.2. *The response of financial development to economic growth*

The previous subsection shows that financial development has no significant effect on economic growth. This subsection examines the reverse link, which is a direct test of [Robinson's \(1952\)](#) hypothesis that “where enterprise leads, finance follows,” in the context of LAC. I begin in [Table 6](#) with domestic private sector credit by banks and other financial institutions as the outcome variable and per capita GDP growth as the main independent variable of interest, including the set of control variables that other studies show are correlated with financial development ([Aggarwal et al., 2011](#); [Gupta et al., 2009](#); [Williams, 2016](#)). The aim is to assess whether, in LAC, economic growth increases

<sup>6</sup> P-values above 1 or close to 1 for the over-identification test suggest over-fitting of the model. [Roodman \(2009\)](#) provides a comprehensive review of the first differences GMM and system-GMM estimators.

<sup>7</sup> These countries are: Argentina, Bolivia, Brazil, Chile, Costa Rica, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela. All the Small Island developing States are excluded. I thank the editor Marcos Y. Nakaguma for this suggestion.

Table 3  
Effect of domestic private sector credit by banks and other financial institutions on economic growth for major LAC countries.

|  | 1970–1999            |                     | 1970–2004            |                   | 1970–2009           |                   | 2004–2013            |                   | 1970–2014            |                   |
|--|----------------------|---------------------|----------------------|-------------------|---------------------|-------------------|----------------------|-------------------|----------------------|-------------------|
|  | D-GMM (1)            | S-GMM (2)           | D-GMM(3)             | S-GMM (4)         | D-GMM (5)           | S-GMM (6)         | D-GMM (7)            | S-GMM (8)         | D-GMM (9)            | S-GMM (10)        |
| Dependent variable: real per capita GDP growth |                      |                     |                      |                   |                     |                   |                      |                   |                      |                   |
| lnPer capita GDP, (t – 1)                      | –0.098***<br>(0.021) | –0.030**<br>(0.017) | –0.073***<br>(0.019) | –0.001<br>(0.054) | –0.148**<br>(0.056) | –0.011<br>(0.021) | –0.026***<br>(0.005) | –0.014<br>(0.022) | –0.142***<br>(0.052) | –0.003<br>(0.025) |
| lnPrivate credit, (t – 1)                      | 0.015 (0.009)        | 0.011 (0.021)       | 0.012 (0.007)        | 0.026 (0.033)     | 0.003 (0.016)       | 0.012 (0.037)     | –0.028<br>(0.069)    | 0.010 (0.055)     | –0.004<br>(0.007)    | 0.002<br>(0.026)  |
| lnTrade, (t – 1)                               | –0.005<br>(0.011)    | 0.010 (0.031)       | –0.001<br>(0.012)    | –0.008<br>(0.121) | 0.017 (0.030)       | 0.037 (0.036)     | –0.078<br>(0.108)    | –0.002<br>(0.045) | 0.019 (0.026)        | –0.001<br>(0.043) |
| lnInflation, (t – 1)                           | 0.067 (0.069)        | 0.022 (0.053)       | 0.038 (0.045)        | –0.052<br>(0.209) | –0.033<br>(0.101)   | –0.058<br>(0.112) | –1.173***<br>(0.316) | 0.333 (1.183)     | 0.060(0.057)         | –0.037<br>(0.114) |
| lnGovernment con., (t – 1)                     | –0.051***<br>(0.016) | –0.043**<br>(0.018) | –0.024***<br>(0.007) | –0.026<br>(0.023) | –0.028**<br>(0.014) | –0.032<br>(0.014) | –0.235<br>(0.183)    | –0.111<br>(0.076) | –0.025*<br>(0.014)   | 0.006<br>(0.017)  |
| lnEducation, (t – 1)                           | –0.032*<br>(0.017)   | 0.059 (0.064)       | –0.039<br>(0.018)    | –0.014<br>(0.094) | –0.088<br>(0.058)   | 0.013 (0.025)     | 0.298 (0.192)        | 0.276 (0.114)     | –0.014<br>(0.026)    | –0.035<br>(0.041) |
| lnPopulation growth, (t – 1)                   | –0.005<br>(0.021)    | –0.010<br>(0.021)   | –0.004<br>(0.018)    | –0.014<br>(0.027) | 0.037 (0.026)       | 0.014 (0.044)     | –0.055<br>(0.093)    | 0.014 (0.043)     | –0.003<br>(0.022)    | –0.030<br>(0.035) |
| Year FE  | Yes                  | Yes                 | Yes                  | Yes               | Yes                 | Yes               | Yes                  | Yes               | Yes                  | Yes               |
| Country FE                                     | Yes                  | Yes                 | Yes                  | Yes               | Yes                 | Yes               | Yes                  | Yes               | Yes                  | Yes               |
| AR(2), test                                    | 0.93                 | 0.17                | 0.31                 | 0.35              | 0.94                | 0.29              | 0.17                 | 0.25              | 0.57                 | 0.18              |
| Hansen test                                    | 1.00                 | 0.32                | 1.00                 | 1.00              | 1.00                | 1.00              | 0.20                 | 0.13              | 0.99                 | 0.75              |
| Observations                                   | 62                   | 81                  | 77                   | 97                | 93                  | 99                | 50                   | 56                | 110                  | 117               |

Notes: This table reports estimates of the effect of private sector credit by deposit banks and other financial institutions on economic growth for major LAC countries. Estimates in columns 1, 3, 5, 7, and 9 are based on the [Arellano and Bond \(1991\)](#) first differences GMM (D-GMM) dynamic panel estimator and robust standard errors. Estimates in columns 2, 4, 6, 8, and 10 are based on the [Blundel and Bond \(1998\)](#) system-GMM (S-GMM) dynamic panel estimator and robust standard errors are computed with the [Windmeijer \(2005\)](#) finite sample correction. Period 2004–2013 captures the so-called LAC decade. AR(2) and Hansen tests are p-values for second order serial correlation and instrument relevance, respectively. \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively. All control variables are treated as endogenous in the first differences and system-GMM.

Table 4  
Effect of domestic private sector credit by banks only on economic growth.

|  | 1970–1999            |                     | 1970–2004            |                     | 1970–2009            |                    | 2004–2013            |                   | 1970–2014            |                     |
|--|----------------------|---------------------|----------------------|---------------------|----------------------|--------------------|----------------------|-------------------|----------------------|---------------------|
|  | D-GMM (1)            | S-GMM (2)           | D-GMM (3)            | S-GMM (4)           | D-GMM (5)            | S-GMM (6)          | D-GMM (7)            | S-GMM (8)         | D-GMM (9)            | S-GMM (10)          |
| Dependent variable: real per capita GDP growth |                      |                     |                      |                     |                      |                    |                      |                   |                      |                     |
| lnPer capita<br>GDP, (t – 1)                   | –0.106***<br>(0.016) | –0.042**<br>(0.016) | –0.090***<br>(0.014) | –0.019**<br>(0.007) | –0.111***<br>(0.038) | –0.064*<br>(0.033) | –0.013**<br>(0.005)  | –0.003<br>(0.021) | –0.083***<br>(0.013) | –0.029**<br>(0.011) |
| lnPrivate<br>credit by<br>banks, (t – 1)       | 0.007 (0.008)        | 0.020 (0.015)       | 0.005 (0.004)        | 0.024 (0.020)       | 0.011 (0.011)        | 0.025 (0.017)      | –0.121***<br>(0.036) | –0.046<br>(0.039) | 0.002 (0.004)        | 0.0002<br>(0.017)   |
| lnTrade,<br>(t – 1)                            | 0.017 (0.011)        | 0.050* (0.026)      | 0.023**<br>(0.009)   | 0.002 (0.009)       | 0.043 (0.040)        | –0.007<br>(0.014)  | 0.064 (0.043)        | 0.017 (0.031)     | 0.021**<br>(0.008)   | 0.042<br>(0.029)    |
| lnInflation,<br>(t – 1)                        | 0.045 (0.039)        | –0.073<br>(0.076)   | 0.031 (0.027)        | –0.010<br>(0.047)   | –0.042<br>(0.081)    | 0.020 (0.054)      | 0.141<br>(0.174)     | –0.071<br>(0.023) | 0.039 (0.026)        | –0.085<br>(0.076)   |
| lnGovernment<br>cons., (t – 1)                 | –0.047**<br>(0.019)  | –0.031<br>(0.018)   | –0.025***<br>(0.008) | –0.025<br>(0.021)   | –0.024**<br>(0.011)  | –0.002<br>(0.027)  | –0.047<br>(0.040)    | –0.041<br>(0.062) | –0.013*<br>(0.006)   | 0.018<br>(0.027)    |
| lnEducation,<br>(t – 1)                        | 0.004 (0.015)        | 0.097**<br>(0.041)  | 0.001 (0.014)        | 0.028 (0.022)       | 0.004 (0.020)        | –0.019<br>(0.026)  | 0.012 (0.078)        | –0.138<br>(0.187) | 0.002<br>(0.013)     | 0.096*<br>(0.048)   |
| lnPopulation<br>growth, (t – 1)                | 0.010* (0.005)       | 0.009 (0.015)       | 0.011**<br>(0.005)   | –0.004<br>(0.010)   | 0.014**<br>(0.006)   | –0.010<br>(0.007)  | –0.016<br>(0.051)    | –0.003<br>(0.053) | 0.006 (0.005)        | –0.002<br>(0.017)   |
| Year FE  | Yes                  | Yes                 | Yes                  | Yes                 | Yes                  | Yes                | Yes                  | Yes               | Yes                  | Yes                 |
| Country FE                                     | Yes                  | Yes                 | Yes                  | Yes                 | Yes                  | Yes                | Yes                  | Yes               | Yes                  | Yes                 |
| AR(2), test                                    | 0.47                 | 0.79                | 0.82                 | 0.47                | 0.59                 | 0.63               | 0.69                 | 0.26              | 0.77                 | 0.48                |
| Hansen test                                    | 1.00                 | 0.63                | 1.00                 | 0.64                | 0.25                 | 1.00               | 0.99                 | 1.00              | 1.00                 | 0.89                |
| Observations                                   | 89                   | 118                 | 110                  | 119                 | 113                  | 149                | 67                   | 77                | 162                  | 153                 |

Notes: This table reports estimates of the effect of private sector credit by deposit banks only. Estimates in columns 1, 3, 5, 7, and 9 are based on the [Arellano and Bond \(1991\)](#) first differences GMM (D-GMM) dynamic panel estimator and robust standard errors. Estimates in columns 2, 4, 6, 8, and 10 are based on the [Blundel and Bond \(1998\)](#) system-GMM (S-GMM) dynamic panel estimator and robust standard errors are computed with the [Windmeijer \(2005\)](#) finite sample correction. Period 2004–2013 captures the so-called LAC decade. AR(2) and Hansen tests are p-values for second order serial correlation and instrument relevance, respectively. \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively. All control variables are treated as endogenous in the first differences and system-GMM.

Table 5  
Effect of liquid liabilities on economic growth.

|  | 1970–1999            |                      | 1970–2004            |                     | 1970–2009           |                | 2004–2013      |                | 1970–2014            |                      |
|--|----------------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|----------------|----------------------|----------------------|
|  | D-GMM (1)            | S-GMM (2)            | D-GMM (3)            | S-GMM (4)           | D-GMM (5)           | S-GMM (6)      | D-GMM (7)      | S-GMM (8)      | D-GMM (9)            | S-GMM (10)           |
| Dependent variable: real per capita GDP growth |                      |                      |                      |                     |                     |                |                |                |                      |                      |
| lnPer capita GDP, (t – 1)                      | –0.121***<br>(0.015) | –0.036**<br>(0.017)  | –0.098***<br>(0.015) | –0.014**<br>(0.006) | –0.095***(0.015)    | –0.051 (0.041) | –0.007 (0.006) | –0.004 (0.013) | –0.087***<br>(0.013) | –0.060***<br>(0.021) |
| lnLiquid liabilities, (t – 1)                  | 0.012 (0.014)        | 0.036 (0.026)        | 0.005 (0.010)        | 0.020 (0.020)       | 0.005 (0.008)       | 0.009 (0.021)  | –0.070 (0.070) | –0.023 (0.030) | 0.002 (0.007)        | 0.010<br>(0.024)     |
| lnTrade, (t – 1)                               | 0.023 (0.015)        | 0.001 (0.017)        | 0.024** (0.011)      | –0.003 (0.027)      | 0.024 (0.010)       | 0.001 (0.019)  | –0.018 (0.095) | 0.042 (0.080)  | 0.020** (0.009)      | –0.018<br>(0.026)    |
| lnInflation, (t – 1)                           | 0.066* (0.039)       | 0.004 (0.056)        | 0.046 (0.032)        | 0.035 (0.047)       | 0.034 (0.021)       | 0.025 (0.037)  | 0.075 (0.327)  | –0.057 (0.056) | 0.051 (0.023)        | 0.124*** (0.044)     |
| lnGovernment cons., (t – 1)                    | –0.053***<br>(0.018) | –0.059***<br>(0.019) | –0.026***<br>(0.007) | –0.019 (0.024)      | –0.015**<br>(0.007) | –0.021 (0.011) | –0.009 (0.058) | –0.035 (0.050) | –0.013* (0.007)      | 0.018<br>(0.022)     |
| lnEducation, (t – 1)                           | 0.003 (0.018)        | 0.062* (0.032)       | –0.003 (0.015)       | 0.014 (0.019)       | 0.003 (0.014)       | 0.046 (0.029)  | –0.010 (0.081) | –0.007 (0.091) | –0.0001 (0.013)      | –0.019<br>(0.030)    |
| lnPopulation growth, (t – 1)                   | 0.011 (0.005)        | 0.004 (0.008)        | 0.012** (0.004)      | 0.0004 (0.006)      | 0.009* (0.005)      | –0.004 (0.006) | –0.032 (0.057) | –0.004 (0.038) | 0.007 (0.005)        | 0.016<br>(0.014)     |
| Year FE  | Yes                  | Yes                  | Yes                  | Yes                 | Yes                 | Yes            | Yes            | Yes            | Yes                  | Yes                  |
| Country FE                                     | Yes                  | Yes                  | Yes                  | Yes                 | Yes                 | Yes            | Yes            | Yes            | Yes                  | Yes                  |
| AR(2), test                                    | 0.56                 | 0.68                 | 0.93                 | 0.23                | 0.91                | 0.59           | 0.79           | 0.34           | 0.87                 | 0.27                 |
| Hansen test                                    | 1.00                 | 1.00                 | 1.00                 | 0.31                | 1.00                | 1.00           | 0.95           | 1.00           | 1.00                 | 1.00                 |
| Observations                                   | 86                   | 115                  | 107                  | 116                 | 130                 | 119            | 67             | 77             | 158                  | 148                  |

Notes: This table reports estimates of the effect of liquid liabilities on economic growth. Estimates in columns 1, 3, 5, 7, and 9 are based on the [Arellano and Bond \(1991\)](#) first differences GMM (D-GMM) dynamic panel estimator and robust standard errors. Estimates in columns 2, 4, 6, 8, and 10 are based on the [Blundel and Bond \(1998\)](#) system-GMM (S-GMM) dynamic panel estimator and robust standard errors are computed with the [Windmeijer \(2005\)](#) finite sample correction. Period 2004–2013 captures the so-called LAC decade. AR(2) and Hansen tests are p-values for second order serial correlation and instrument relevance, respectively. \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively. All control variables are treated as endogenous in the first differences and system-GMM.

Table 6  
Effect of economic growth on domestic private sector credit by banks and other financial institutions.

|  | 1970–1999           |                     | 1970–2004           |                    | 1970–2009           |                    | 2004–2013           |                     | 1970–2014           |                     |
|--|---------------------|---------------------|---------------------|--------------------|---------------------|--------------------|---------------------|---------------------|---------------------|---------------------|
|  | D-GMM (1)           | S-GMM (2)           | D-GMM (3)           | S-GMM (4)          | D-GMM (5)           | S-GMM (6)          | D-GMM (7)           | S-GMM (8)           | D-GMM (9)           | S-GMM (10)          |
| Dependent variable: log domestic private sector credit by banks and other financial institutions |                     |                     |                     |                    |                     |                    |                     |                     |                     |                     |
| lnPrivate credit, (t – 1)  | 0.301***<br>(0.110) | 0.439* (0.240)      | 0.665***<br>(0.222) | 0.536**<br>(0.236) | 0.321***<br>(0.061) | 0.512**<br>(0.235) | 0.404***<br>(0.116) | 0.970***<br>(0.080) | 0.418***<br>(0.176) | 0.850***<br>(0.135) |
| Per capita GDP growth, (t – 1)   | –1.213<br>(1.284)   | –0.742<br>(2.039)   | 1.976 (2.662)       | 1.788 (3.688)      | 1.088 (1.069)       | 1.307 (1.054)      | 1.289 (1.481)       | –0.287<br>(2.492)   | 0.021 (1.614)       | 3.942<br>(2.421)    |
| lnPer capita GDP, (t – 1)  | 0.310 (0.293)       | 0.093 (0.270)       | 1.130**(0.555)      | –0.042<br>(0.247)  | 0.494* (0.273)      | 0.383**<br>(0.156) | –0.044<br>(0.036)   | 0.010 (0.085)       | –0.032<br>(0.383)   | 0.147**<br>(0.067)  |
| lnInflation, (t – 1)   | 3.409***<br>(1.174) | 1.455***<br>(0.493) | 0.648 (1.083)       | 1.323 (1.003)      | 0.539 (0.470)       | 0.056 (0.717)      | 0.567 (0.511)       | –0.686<br>(0.502)   | 1.088**<br>(0.431)  | –0.741<br>(0.624)   |
| lnExports, (t – 1)   | 0.121*(0.064)       | –0.002<br>(0.064)   | 0.031 (0.067)       | 0.028 (0.085)      | 0.055 (0.040)       | 0.077 (0.072)      | –0.028<br>(0.038)   | 0.027 (0.029)       | –0.022<br>(0.070)   | 0.001<br>(0.081)    |
| lnRemittances, (t – 1)   | –0.015<br>(0.020)   | 0.006 (0.035)       | 0.037 (0.034)       | –0.013<br>(0.059)  | –0.004<br>(0.015)   | –0.003<br>(0.015)  | 0.020 (0.009)       | –0.011<br>(0.008)   | –0.005<br>(0.013)   | 0.009<br>(0.022)    |
| Year FE  | Yes                 | Yes                 | Yes                 | Yes                | Yes                 | Yes                | Yes                 | Yes                 | Yes                 | Yes                 |
| Country FE   | Yes                 | Yes                 | Yes                 | Yes                | Yes                 | Yes                | Yes                 | Yes                 | Yes                 | Yes                 |
| AR(2), test  | 0.43                | 0.47                | 0.26                | 0.05               | 0.01                | 0.29               | 0.72                | 0.89                | 0.00                | 0.01                |
| Hansen test  | 1.00                | 1.00                | 0.17                | 0.45               | 1.00                | 1.00               | 1.00                | 1.00                | 0.75                | 0.76                |
| Observations   | 64                  | 95                  | 91                  | 120                | 120                 | 155                | 91                  | 128                 | 150                 | 181                 |

Notes: The table reports estimates of the effect of economic growth on domestic private sector credit by banks and other financial institutions. Estimates in columns 1, 3, 5, 7, and 9 are based on the [Arellano and Bond \(1991\)](#) first differences GMM (D-GMM) dynamic panel estimator and robust standard errors. Estimates in columns 2, 4, 6, 8, and 10 are based on [Blundel and Bond \(1998\)](#) system-GMM (S-GMM) dynamic panel estimator and robust standard errors are computed with the [Windmeijer \(2005\)](#) finite sample correction. Period 2004–2013 captures the so-called LAC decade. AR(2) and Hansen tests are p-values for second order serial correlation and instrument relevance, respectively. \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively. All control variables are treated as endogenous in the first differences and system-GMM.

the possibility of individuals to offer financial products as predicted by economic theory (Greenwood and Jovanovic, 1990). The main message from Table 6 is that economic growth is not significantly related to financial development.

Columns 1–2 present estimates for the 1970–1999 sub-period. In these model specifications, the estimated coefficient on economic growth has the wrong sign (negative) and is not statistically significant at any convention level. One can therefore reject the hypothesis that the effect of economic growth on financial development is significantly different from zero. In columns 3–4, sub-period 1970–2004, even though the estimated coefficient on financial development is now positive, it continues to be statistically insignificant. The picture does not change if I focus on the 1970–2009 sub-period, columns 7–9; economic growth is not a significant determinant of financial development. One concern with the estimates for the sub-period 1970–2009 is that the recession in LAC in 2009 due to the global financial crisis that caused economic growth to slowdown could bias the effect that economic growth has on financial development. This is unlikely to be the case, however, as time-specific shocks are accounted for with the inclusion of time fixed effects. The message is similar when I move to the LAC decade (columns 7–8): there is no evidence of a significant link from economic growth to financial development.

Estimates for the entire sample period, 1970–2014, are reported in columns 9–10. Once again, the estimated coefficient on economic growth is not significantly different from zero, indicating that economic growth is not associated with financial development. The lagged dependent variable is positive and significant across the different time-periods and estimation techniques, suggesting that financial development is persistent. Per capita GDP that controls for the size of the economy and legal institutions appears to be a significant determinant of financial development. There is some evidence of a positive and significant association with inflation particularly over the 1970–1999 and the 1970–2014 periods. The central finding here of no significant effect of economic growth counters evidence of a significant positive effect of economic growth for Jamaica and Singapore reported by Iyare and Moore (2011).

As in the previous subsection, I show in the current subsection that the main finding of no significant link from economic growth to financial development is also confirmed based on the sub-sample of major LAC economies, and also when using liquid liabilities and domestic private sector credit by deposit banks only as alternative measures of financial development. Table 7 present estimates for the major LAC economies, again using domestic private sector credit by banks and other financial institutions as the outcome variable. Table 8 uses domestic private sector credit by deposit banks only as the dependent variable and Table 9 uses liquid liabilities. Conditional on the control variables, there is no significant effect of economic growth with either of these measures of financial development in any of the model specifications, or when focusing on the sub-sample, although estimates are less precisely estimated than in the previous subsection. A straightforward interpretation of the finding is that economic growth does not increase demands for financial products in LAC. Surprisingly, inflation continues to have a significant positive effect on financial development. This finding seems counterintuitive, as one should expect inflation to distort economic activities, leading to less financial intermediation (Aggarwal et al., 2011). The lagged dependent variable remains highly persistent. In sum, the evidence in this section shows that the finance–growth link in LAC might have been broken over the 1970–2014 period.<sup>8</sup>

## 5. Discussion of potential reasons for the broken link

Given the financial reforms undertaken in LAC in the 1970, 1980s, and 1990s, why does the finance–growth link appear to have been broken over the sample period, 1970–2014? One reading of the evidence is that despite improvements in financial deepening since the 1970s, the financial system is not channelling enough credit to investment projects with the highest returns. In fact, in the LAC region household credit is increasing at the expense of enterprise credit (Didier and Schmukler, 2014). Though I do not have disaggregated data to assess the relative importance of enterprise and household credits, Beck et al. (2008) show in a panel of 45 developed and developing countries that household credit is not significantly associated with economic growth, while enterprise credit is a significant driver of economic growth. Furthermore, given the low levels of financial intermediation in LAC, there may be a threshold

<sup>8</sup> In both subsections, I also use total domestic credit, which includes credit to the government, to measure financial development. Results are qualitatively similar in both cases: there is no significant relationship between economic growth and this measure of financial development. Results are not reported to save space but are available from the author upon request.

**Table 7**  
Effect of economic growth on domestic private sector credit by banks and other financial institutions for major LAC countries.

|  | 1970–1999      |                | 1970–2004      |                | 1970–2009      |                 | 2004–2013       |                 | 1970–2014       |                 |
|--|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|  | D-GMM (1)      | S-GMM (2)      | D-GMM (3)      | S-GMM (4)      | D-GMM (5)      | S-GMM (6)       | D-GMM (7)       | S-GMM (8)       | D-GMM (9)       | S-GMM (10)      |
| Dependent variable: log domestic private sector credit by banks and other financial institutions |                |                |                |                |                |                 |                 |                 |                 |                 |
| lnPrivate credit, (t – 1)  | 0.216**(0.103) | 0.604**(0.251) | 0.259**(0.111) | 0.548**(0.270) | 0.263**(0.114) | 0.770***(0.257) | 0.392***(0.105) | 0.888***(0.147) | 0.248***(0.091) | 0.850***(0.135) |
| Per capita GDP growth, (t – 1)   | –1.483 (1.669) | –5.005 (5.103) | 1.236 (2.183)  | 3.128 (7.653)  | 2.899 (2.320)  | 6.360(9.595)    | 0.172(1.646)    | 0.959 (4.574)   | 0.297 (0.908)   | 3.942(2.421)    |
| lnPer capita GDP, (t – 1)  | 0.180 (0.387)  | –0.329 (0.328) | 0.801 (1.038)  | –0.199 (0.378) | 0.062 (0.542)  | 0.053 (0.498)   | 0.021 (0.033)   | 0.014 (0.140)   | 0.181 (0.274)   | 0.147 (0.067)   |
| lnInflation, (t – 1)   | 4.613 (1.161)  | 2.046 (2.041)  | 0.980 (1.186)  | 0.395 (2.620)  | 0.439 (0.783)  | –0.337 (3.263)  | –0.419 (0.508)  | –0.308 (1.492)  | 1.019**(0.471)  | –0.741 (0.624)  |
| lnExports, (t – 1)   | 0.142 (0.059)  | –0.063 (0.092) | 0.120 (0.087)  | –0.045 (0.097) | 0.054 (0.073)  | –0.007 (0.192)  | –0.030 (0.031)  | –0.032 (0.028)  | –0.019 (0.048)  | 0.001 (0.081)   |
| lnRemittances, (t – 1)   | –0.035(0.042)  | 0.034 (0.069)  | 0.023 (0.055)  | 0.029 (0.053)  | 0.043 (0.019)  | 0.024 (0.047)   | 0.002 (0.016)   | 0.010 (0.015)   | –0.009 (0.017)  | 0.009 (0.022)   |
| Year FE  | Yes            | Yes            | Yes            | Yes            | Yes            | Yes             | Yes             | Yes             | Yes             | Yes             |
| Country FE   | Yes            | Yes            | Yes            | Yes            | Yes            | Yes             |                 | Yes             | Yes             | Yes             |
| AR(2), test  | 0.53           | 0.29           | 0.06           | 0.05           | 0.02           | 0.08            | 0.88            | 0.68            | 0.00            | 0.01            |
| Hansen test  | 1.00           | 1.00           | 0.99           | 0.92           | 1.00           | 0.61            | 1.00            | 1.00            | 1.00            | 0.81            |
| Observations   | 45             | 66             | 62             | 80             | 79             | 102             | 64              | 86              | 150             | 181             |

*Notes:* The table reports estimates of the effect of economic growth on domestic private sector credit by banks and other financial institutions for major LAC countries. Estimates in columns 1, 3, 5, 7, and 9 are based on the [Arellano and Bond \(1991\)](#) first differences GMM (D-GMM) dynamic panel estimator and robust standard errors. Estimates in columns 2, 4, 6, 8, and 10 are based on [Blundel and Bond \(1998\)](#) system-GMM (S-GMM) dynamic panel estimator and robust standard errors are computed with the [Windmeijer \(2005\)](#) finite sample correction. Period 2004–2013 captures the so-called LAC decade. AR(2) and Hansen tests are p-values for second order serial correlation and instrument relevance, respectively. \*\*\*and \*\* denote significance at 1% and 5%, respectively. All control variables are treated as endogenous in the first differences and system-GMM.



Table 8  
Effect of economic growth on domestic private sector credit by banks only.

|  | 1970–1999        |                  | 1970–2004        |                 | 1970–2009       |                 | 2004–2013      |                  | 1970–2014       |                  |
|--|------------------|------------------|------------------|-----------------|-----------------|-----------------|----------------|------------------|-----------------|------------------|
|  | D-GMM (1)        | S-GMM (2)        | D-GMM (3)        | S-GMM (4)       | D-GMM (5)       | S-GMM (6)       | D-GMM (7)      | S-GMM (8)        | D-GMM (9)       | S-GMM (10)       |
| Dependent variable: log domestic private sector credit by deposit banks only |                  |                  |                  |                 |                 |                 |                |                  |                 |                  |
| lnPrivate credit by banks, (t – 1)   | 0.322* (0.175)   | 0.411**(0.180)   | 0.637*** (0.235) | 0.397** (0.196) | 0.312** (0.132) | 0.486* (0.243)  | 0.234* (0.142) | 0.954*** (0.046) | 0.341* (0.197)  | 0.666*** (0.220) |
| Per capita GDP growth, t – 1   | –1.103 (1.264)   | –0.186 (1.888)   | 1.955 (2.525)    | 2.144 (1.945)   | 1.701 (1.335)   | 3.319 (2.244)   | 0.608 (1.697)  | 2.089 (2.105)    | 0.568 (2.193)   | –0.605 (1.964)   |
| lnPer capita GDP, (t – 1)  | 0.334 (0.315)    | –0.101 (0.211)   | 1.111** (0.575)  | 0.102 (0.117)   | 0.380 (0.392)   | –0.196 (0.214)  | –0.008 (0.049) | –0.039 (0.067)   | 0.114 (0.391)   | –0.140 (0.200)   |
| lnInflation, (t – 1)   | 3.265*** (1.269) | 1.689*** (0.597) | 0.738 (1.238)    | 1.410** (0.567) | 1.326* (0.727)  | 1.669** (0.803) | 0.476 (0.608)  | –0.057 (0.229)   | 1.379** (0.554) | 1.124*** (0.343) |
| lnExports, (t – 1)   | 0.103 (0.067)    | 0.053 (0.036)    | 0.017 (0.074)    | 0.030 (0.059)   | 0.016 (0.054)   | –0.044 (0.093)  | –0.052 (0.049) | 0.003 (0.018)    | –0.078 (0.060)  | 0.004 (0.051)    |
| lnRemittances, (t – 1)   | –0.009 (0.020)   | –0.019 (0.025)   | 0.044 (0.032)    | –0.009 (0.029)  | –0.005 (0.021)  | –0.005 (0.040)  | 0.021 (0.009)  | –0.004 (0.006)   | 0.009 (0.018)   | –0.025 (0.013)   |
| Year FE  | Yes              | Yes              | Yes              | Yes             | Yes             | Yes             | Yes            | Yes              | Yes             | Yes              |
| Country FE   | Yes              | Yes              | Yes              | Yes             | Yes             | Yes             | Yes            | Yes              | Yes             | Yes              |
| AR(2), test  | 0.55             | 0.54             | 0.31             | 0.08            | 0.08            | 0.12            | 0.86           | 0.80             | 0.01            | 0.02             |
| Hansen test  | 1.00             | 1.00             | 0.50             | 0.73            | 1.00            | 1.00            | 0.99           | 1.00             | 0.99            | 0.99             |
| Observations   | 64               | 91               | 91               | 120             | 120             | 151             | 91             | 100              | 150             | 181              |

Notes: The table reports estimates of the effect of economic growth on domestic private sector credit by deposit banks only. Estimates in columns 1, 3, 5, 7, and 9 are based on the [Arellano and Bond \(1991\)](#) first differences GMM (D-GMM) dynamic panel estimator and robust standard errors. Estimates in columns 2, 4, 6, 8, and 10 are based on [Blundel and Bond \(1998\)](#) system-GMM (S-GMM) dynamic panel estimator and robust standard errors are computed with the [Windmeijer \(2005\)](#) finite sample correction. Period 2004–2013 captures the so-called LAC decade. AR(2) and Hansen tests are p-values for second order serial correlation and instrument relevance, respectively. \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively. All control variables are treated as endogenous in the first differences and system-GMM.

Table 9  
Effect of economic growth on liquid liabilities.

|  | 1970–1999        |                 | 1970–2009        |                  | 1970–2009        |                  | 2004–2013        |                  | 1970–2014        |                  |
|--|------------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|  | D-GMM (1)        | S-GMM (2)       | D-GMM (3)        | S-GMM (4)        | D-GMM (5)        | S-GMM (6)        | D-GMM (7)        | S-GMM (8)        | D-GMM (9)        | S-GMM (10)       |
| Dependent variable: log liquid liabilities |                  |                 |                  |                  |                  |                  |                  |                  |                  |                  |
| Inliquid liabilities, (t – 1)              | 0.426*** (0.126) | 0.578** (0.273) | 0.425*** (0.077) | 0.780*** (0.184) | 0.249*** (0.089) | 0.773*** (0.157) | 0.314*** (0.093) | 0.914*** (0.074) | 0.615*** (0.163) | 0.659*** (0.130) |
| Per capita GDP growth, t – 1               | –0.409 (0.951)   | –0.303 (1.461)  | 0.929 (0.757)    | –0.406 (1.854)   | 0.746 (1.053)    | 0.225 (1.197)    | –0.132 (1.609)   | 1.038 (2.311)    | 1.334 (1.755)    | –1.170 (1.675)   |
| lnPer capita GDP, (t – 1)                  | 0.112 (0.327)    | –0.065 (0.155)  | 0.215 (0.270)    | –0.063 (0.147)   | 0.548 (0.381)    | –0.025 (0.134)   | 0.022 (0.042)    | –0.019 (0.066)   | –0.373 (0.380)   | 0.047 (0.137)    |
| lnInflation, (t – 1)                       | 2.601** (1.249)  | 1.260* (0.716)  | 0.905 (0.699)    | 0.754** (0.330)  | 1.288 (0.556)    | 0.648 (0.321)    | 0.659* (0.396)   | 0.260 (0.230)    | 0.764*** (0.291) | 0.904* (0.476)   |
| lnExports, (t – 1)                         | 0.093** (0.044)  | –0.002 (0.046)  | 0.033 (0.026)    | 0.044 (0.048)    | 0.051 (0.035)    | 0.040 (0.062)    | –0.032 (0.041)   | 0.006 (0.016)    | –0.035 (0.040)   | 0.039 (0.051)    |
| lnRemittances, (t – 1)                     | –0.019 (0.016)   | –0.019 (0.020)  | –0.012 (0.013)   | –0.013 (0.029)   | –0.025 (0.016)   | –0.012 (0.035)   | 0.016* (0.009)   | –0.005 (0.005)   | –0.019 (0.011)   | –0.007 (0.009)   |
| Year FE                                    | Yes              | Yes             | Yes              | Yes              | Yes              | Yes              | Yes              | Yes              | Yes              | Yes              |
| Country FE                                 | Yes              | Yes             | Yes              | Yes              | Yes              | Yes              | Yes              | Yes              | Yes              | Yes              |
| AR(2), test                                | 0.35             | 0.42            | 0.21             | 0.14             | 0.15             | 0.10             | 0.16             | 0.14             | 0.05             | 0.04             |
| Hansen test                                | 0.99             | 1.00            | 1.00             | 0.92             | 1.00             | 0.99             | 0.97             | 1.00             | 0.97             | 0.97             |
| Observations                               | 63               | 68              | 89               | 96               | 117              | 147              | 91               | 70               | 146              | 176              |

Notes: The table reports estimates of the effect of economic growth on liquid liabilities. Estimates in columns 1, 3, 5, 7, and 9 are based on the [Arellano and Bond \(1991\)](#) first differences GMM (D-GMM) dynamic panel estimator and robust standard errors. Estimates in columns 2, 4, 6, 8, and 10 are based on [Blundel and Bond \(1998\)](#) system-GMM (S-GMM) dynamic panel estimator and robust standard errors are computed with the [Windmeijer \(2005\)](#) finite sample correction. Period 2004–2013 captures the so-called LAC decade. AR(2) and Hansen tests are p-values for second order serial correlation and instrument relevance, respectively. \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively. All control variables are treated as endogenous in the first differences and system-GMM.

beyond which domestic private sector credit promotes economic growth.<sup>9</sup> This is an important area for future research. Another potential reason for the insignificant association between domestic private sector credit and economic growth may be due to political connections. In particular, if credit is allocated to inefficient politically connected firms one should not expect a positive link with economic growth.

Unfortunately, political elites in developing and emerging economies use their political office to influence the flow of credit to connected firms. These connected firms get more loans and have higher default rates, which in turn hurts economic growth (Khwaja and Mian, 2005). With weak political institutions, high inequality, and populist political elites, the LAC region offers the environment for political elites to coerce financial institutions to supply credit to politically favoured firms in order to create employment for their supporters (Acemoglu et al., 2013). This coercion of financial institutions is one channel that political elites in LAC can potentially use to meet their distribution agenda.

Also, the weak institutional setting in LAC enables political elites to distort the normal course of the judicial process to influence its decisions (Acemoglu and Robinson, 2012). An independent and efficient judiciary that resolves disputes speedily between debtors and creditors will likely improve the level of financial intermediation, channelling more credits to firms, which is relatively low in LAC compared to other emerging economies.<sup>10</sup> Take Colombia for example, a major country in the sample. In describing “The Misery in Colombia,” Robinson (2016) argues that Columbia’s poor economic outcomes are largely the result of weak democratic institutions. This weak democratic institutions enable political elites to determine how society’s resources are distributed, which foster clientelistic politics. Therefore, the absence of a significant connection between economic growth and finance demonstrated here would be expected in Colombia. Additionally, the breakdown of democratic institutions in Venezuela in which political elites have control of the judiciary and other economic activities would also be consistent with a broken link between economic growth and finance.

## 6. Concluding remarks

This paper examines the two-way relationship between economic growth and financial development in LAC in the context of a lively debate about the effect of finance on economic growth, following the 2008–2009 global financial crisis, and against the backdrop of financial reforms undertaken at various intervals over the 1970–2014 period. The system GMM estimates suggest that financial development does not have a significant effect on economic growth. Less government spending however induces economic growth in LAC. In examining the reverse link from economic growth to financial development, the paper finds no evidence of a significant effect. This implies that the finance–growth link in LAC has been broken.

The findings have important policy implications. To realise the economic gains from financial development and the potential feedback to financial development, policy-makers in the LAC region should take steps to strengthen the finance–growth nexus. Though the region has liberalised the financial system, further steps are required to improve institutional frameworks to protect creditor rights and ensure more effective contract enforcement.

When the business environment is supported by a more predictable legal structure entrepreneurs with potentially profitable ideas will use the formal economy to seek funding from the financial system. Furthermore, household credit is larger than credit to firms in LAC, but only credit to firms improves economic growth (Beck et al., 2008). Public policy that shifts the relative distribution of credit in favour of firms and away from household consumption through tax incentives can improve the growth–finance nexus.

Additionally, given the lack of a significant association between economic growth and financial development in both directions, and the significant negative effect of government spending on economic growth, policy-makers in LAC may need to identify alternative sources to spur economic growth. One potential source of growth is to reduce the size of government, which tends to crowd-out the private sector in accessing finance. Another potential source of economic growth is upgrading of public infrastructure, for example road network, bridges, energy systems, and sewage disposal. The infrastructure gap in LAC is estimated at US\$ 180 billion (Familiar, 2017). Infrastructure upgrading will likely

<sup>9</sup> Hansen and Sulla (2013) show that compared to countries at similar income levels, LAC has lower private sector credit to GDP.

<sup>10</sup> Unfortunately, I do not have data to test whether the finance–growth link is stronger in LAC countries with better judiciary and more political constraints. However, there is ample evidence to suggest that markets work better in countries with stronger democratic institutions and these countries have better growth outcomes (Acemoglu and Robinson, 2012; Williams, 2018).

create an enabling environment for businesses to supply local and international markets and in turn boost economic growth, with positive feedback to financial development.

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