Financial Development and Economic Growth in Latin America: Is Schumpeter Right?*

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Abstract

In this paper we investigate the role of financial development, or more widespread access to all sorts of finance, in generating economic growth in four Latin American countries between 1980 and 2007. The results, based on panel time-series data and analysis, confirm the Schumpeterian prediction which suggests that finance authorises the entrepreneur to invest in productive activities, and therefore to promote economic growth. Furthermore, given the characteristics of the sample of countries chosen, we highlight not only the importance of an open, competitive and active financial sector in channelling financial resources to entrepreneurs, but also the relevance of macroeconomic stability (in terms of low inflation rates), and all the institutional framework that it encompasses (central bank independence and fiscal responsibility laws), as a necessary pre-condition for financial development, and consequently for sustained growth and prosperity in the region.

Keywords: Finance, growth, Latin America.

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Introduction and Motivation

Latin America has been know for a particular tendency to display erratic growth rates, combined with political transitions and poor macroeconomic performance (in terms of high inflation rates), in particular in the 1980s and first half of the 1990s. Some of the countries in the region presenting these, destructive, characteristics include Argentina, Bolivia, Brazil and Peru. Re-democratisation came in the 1980s and macroeconomic stabilisation in the 1990s, and coincidentally enough, growth rates *and* financial development became consistently positive some time after these political transitions had passed and economic stabilisation had taken root in the region.

Given this background, we investigate the role of financial development, or wider access to resources which can be channelled to productive activities, in generating growth and prosperity in four Latin American countries which displayed not only political transitions, but also hyperinflationary episodes in the 1980s and early 1990s. More specifically, we use data from Argentina, Bolivia, Brazil and Peru from 1980 to 2007, and panel time-series analysis to study the role, if any at all, of financial development in promoting economic growth in the region.

The results suggest, once we account for all sorts of endogeneity issues, that financial development indeed played an important role in generating growth in the region, even in a time period which includes severe political and macroeconomic conditions. However, the results also indicate that the effect of finance on growth would be even greater if those countries had not experienced the hyperinflationary episodes of the 1980s and early 1990s. Therefore, we not only confirm the early empirical evidence based on large international cross-sectional and panel analysis using a different sample *and* methodology, but also highlight the role of macroeconomic *in*stability in actually reducing the size of the positive effect of finance on growth, and consequently the welfare costs of poor macroeconomic performance on an important growth determinant[1].

[1]For instance, Beck, Demirgüç-Kunt and Levine (2007), and Bittencourt (2010) suggest that financial development also plays an important role in reducing poverty and inequality, which reinforces the prospective role of finance on economic welfare in general.

Essentially, we stress not only the importance of the financial de-regulation processes that took place in Latin America in the 1990s in helping to create a well-functioning financial sector (open, competitive, less clubby, and therefore more active, Rajan and Zingales (2003)) that provides financial resources to be invested in all sorts of productive activities and which consequently generates faster growth, but also the importance of the implementation of particular economic institutions like central bank independence and fiscal responsibility laws in Latin America in the second half of the 1990s, which played an important role in bringing macroeconomic stability to the region and therefore in creating the necessary pre-conditions for finance to thrive.

Moreover, given the current developments in countries like Argentina and South Africa (the governor of the Argentinean Banco Central has been recently, and somehow hastily, sacked from office; and the policy of inflation targeting conducted by the independent South African Reserve Bank has been under heavy criticism by particular stakeholders), it is always important to understand not only the causes of the hyperinflationary episodes of the past, but also the consequences of periods of closeness and poor macroeconomic performance to particular economic variables (financial development in this case) that can affect, in one way or another, economic welfare.

The subject of financial development and economic growth was first raised by Schumpeter (1912), in which he highlights how important finance is for the growth and development of a capitalist economy. The Schumpeterian analysis is based on the idea that credit, when in the hands of the "entrepreneur", is conducive to growth and prosperity. Loosely speaking, with credit, the entrepreneur can alter the normal flow of an economy through innovations that, in turn, generate growth[2].

Following that expert lead, King and Levine (1993), Levine and Zervos (1998), Beck, Levine and Loyaza (2000), and Beck and Levine (2004), using different large samples of countries covering the period between 1960 and 1998, and methodologies based on cross-

[2]Schumpeter (1912) writes "credit is essentially the creation of purchasing power for the purpose of transferring it to the entrepreneur, but not simply the transfer of existing purchasing power. The creation of purchasing power characterises, in principle, the method by which development is carried out in a system with private property and division of labor".

sectional and panel analysis, report that a range of measures of financial development have a positive effect on long-run growth. In addition, Rousseau and Wachtel (2000), using annual international data from 1980 and 1995, and panel-VAR analysis, are also able to report that finance plays an important role in generating economic growth[3].

Given the above, the contribution of this paper to the literature is that, firstly, we follow the advice given by Fischer (1993) and carry out a *case study* on the subject. That is, we focus on understanding how those Latin American economies behaved during an important period of their recent history. These are economies which shared some common features in the 1980s and early 1990s—political transitions and macroeconomic instability—but which also present particular idiosyncrasies, such as different levels of economic development. The result is a more disaggregated analysis, with more informative results reported. Secondly, we make use of principal component analysis in an attempt to reduce omitted variable biases and *model uncertainty* in growth analysis.

Thirdly, we follow the advice by Bruno and Easterly (1998)—and to a certain extent the analysis by Rousseau and Wachtel (2000)—and make use of *annual data*, so that by avoiding the averages we can better pinpoint the effects of financial development on economic growth in a sample which includes periods of macroeconomic instability[4]. Finally, we take advantage of *panel time-series analysis*, which allows us to deal with particular statistical and economic issues—non-stationarity, and heterogeneity and endogeneity biases in relatively thin panels—so that we are able specifically to study and further our understanding on Latin America, having as background the political transitions and hyperinflationary episodes of the 1980s and early 1990s, without having to treat the region either as a dummy or as an outlier to be removed from the sample as is usually done in large cross-sectional and panel studies. It is therefore believed that we provide new, reliable and informative estimates on the subject of finance and growth in Latin America.

The remainder of the paper is as follows: the next section describes the data set and

[3]For a thorough survey of the literature on finance and growth, see Levine (2005).

[4]In essence, Bruno and Easterly (1998) argue that periods of high inflation are detrimental to, in this case, growth. However when inflation returns to its steady state, growth increases again, so the negative effect of inflation on economic activity in general is cancelled out if the time averages are taken.

the empirical strategy used, and then reports and discusses the estimates obtained. The section which follows concludes the paper, it puts the results into context, and then it suggests some *policy* implications and also future related work.

The Empirical Analysis

A Look at The Data

Given data availability, the data set we use covers the period between 1980 and 2007, and four Latin American countries; namely Argentina, Bolivia, Brazil and Peru (i.e., *T=28* and *N=4*). To briefly illustrate the importance of these four countries in the regional context, they accounted for approximately 70% of the total GDP of South America in 2009.

The growth rates of the real GDP per capita *(GROW)* are provided by the Penn World Table (PWT) data set mark 6.3. The measures of financial development used are the ratio of the liquid liabilities to GDP *(M2)*, which is a baseline measure of financial sector *size,* private bank credit over bank deposits, deposit money bank claims over deposit money bank and central bank claims, both measuring financial intermediaries *activity* in actually channeling resources from savers to borrowers, and stock market capitalisation over GDP, which is a measure of stock market *development*, all from the Database on Financial Development and Structure provided by the World Bank[5].

Using the information above—and assuming that the observed data are generated by a small number of unobserved factors—we can then make use of principal component analysis to extract from the standardised data matrix the unobserved common factors, or the linear combinations, of these four different measures of financial development to construct *FINDEV*. We therefore end up with a proxy for financial development which reduces omitted variable biases and model uncertainty in growth analysis: the proxy also presents more explanatory power. More specifically, in this case the first principal component—which roughly corresponds to the mean of the series—accounts for 42% of the variation in the four above-mentioned financial variables. This is important because, with *FINDEV,* we are

[5]For more on measures of financial development in general, see Demirgüç-Kunt and Levine (2001).

able to reduce the dimensionality of a set of prospective financial development explanatory variables, while retaining most of the information provided by the aforementioned financial variables[6].

The control variables include the government's share in the real GDP *(GOV)*, which proxies for the size of government and captures the fact that governments tend to increase consumption during periods of political transitions, which was indeed the case in Latin America in the 1980s; the ratio of exports and imports to real GDP *(OPEN)*, a proxy for economic openness that captures the processes of trade liberalisation that took place in Latin America in the 1990s; and the ratio of investment to real GDP *(INV)*, as one of the main canonical determinants of growth, all from the PWT files. Moreover, we interact average years of schooling of those aged 25 and over (from the Barro and Lee data set) with urbanisation rates (from the World Development Indicators files) to construct an index for structural development *(DEV)*, which is supposed to capture the unified growth theory fact that fast-growing societies tend to be not only more educated, but also more urbanised (see Kuznets (1955) or Galor (2005)).

Furthermore, by using principal component analysis we are able to extract the unobserved common factors of three normalised Polity IV variables (i.e., democracy, which ranges from 0, a more democratic country, to 1, a less democratic one; constraints on the executive, which ranges from 0, a more constrained executive, to 1, a less constrained one; and political competition, which ranges from 0, more political competition, to 1, less political competition) to construct a proxy for political regime characteristics *(POL)*, which not only reduces model uncertainty and the dimensionality of a set of prospective political regime characteristics variables, but that also takes into account that all four countries in the sample went through political transitions in the 1980s.

Finally, the data on inflation *(INFL)* come from the Bureaux of Census of the four countries, which captures the fact that all these countries experienced poor macroeconomic

[6] See Huang (2010) for more on principal component analysis applied to financial development measures and model uncertainty in growth analysis.

performance (at least in terms of inflation rates), in the 1980s and first half of the 1990s[7].

For the sake of clarity, in Figure One below we plot the data on GDP per capita and the baseline *M2* in Argentina, Bolivia, Brazil and Peru respectively. What we can see from this preliminary eyeball evidence is that in all four countries, GDP per capita and *M2* seem to be moving in the same direction, which indicates that they are positively related.

Moreover, the dotted vertical lines in each panel indicate the transitions to democracy and the solid lines indicate the hyperinflationary episodes that all four countries experienced during either the 1980s or early 1990s. It can be seen that those hyperinflationary episodes happened sometime after re-democratisation, and also that GDP per capita and *M2* suffered severe contractions either before or immediately after those hyperinflationary bursts. For instance, these contractions were so dramatic that these countries converged back to their 1980 levels only, roughly speaking, fifteen years later, in the 1990s.

Furthermore, we are able to visualise that after the macroeconomic stabilisations and liberalisations of the 1990s, both variables have been displaying a consistent positive trend, which initially indicates that macroeconomic stability in general is, to say the least, a necessary condition for financial development and growth in all four countries.

[7] Durlauf, S. N., Johnson, P. A., and Temple, J. R. W. (2005) list different *groups* of variables that, in one way or another, have already been regressed against growth. These include democracy, education, finance, government, inflation, investment and trade. Given data availability, we attempt to not only represent each of these groups without unnecessary duplications in our empirical specifications, but also to connect them to the recent Latin American history.

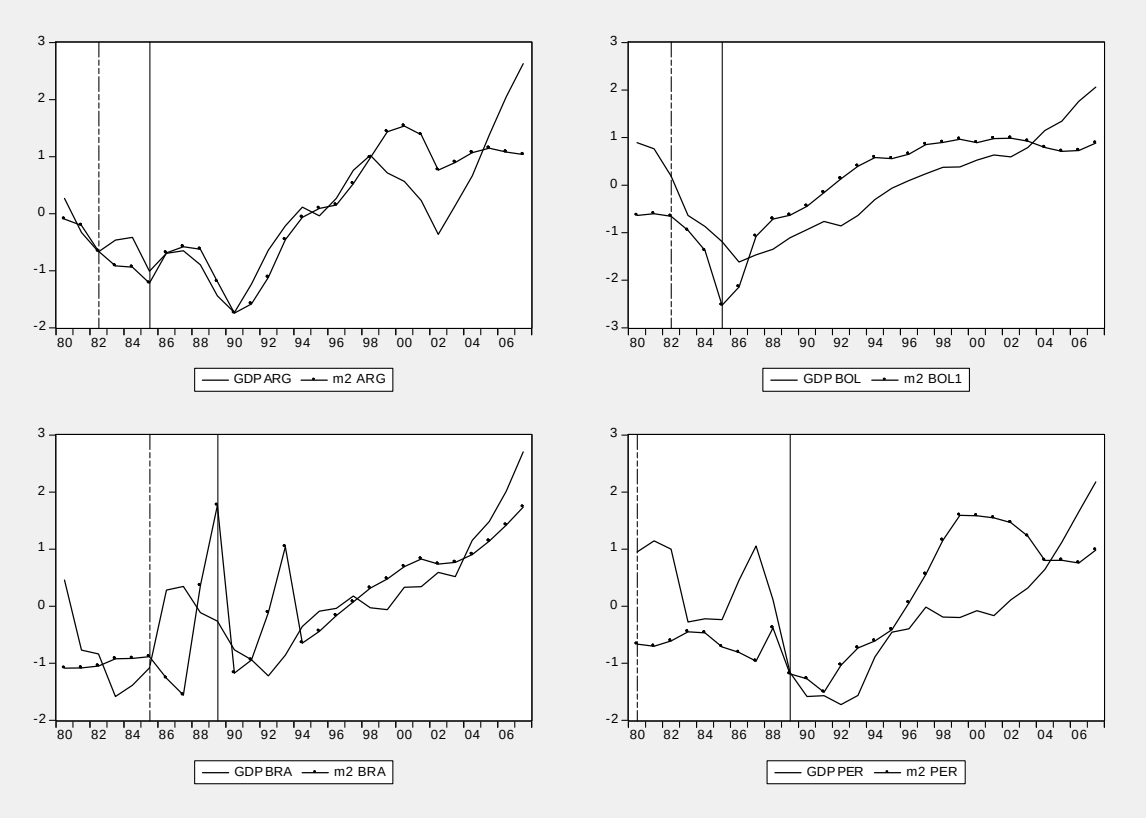

Figure 1: GDP per capita and Financial Development, Argentina, Bolivia, Brazil and Peru, 1980-2007. Sources: Penn World Table and Database on Financial Development and Structure files.

In addition, in Table One we present the correlation matrix of the panel of variables used in the analysis. Both measures of financial development, *M2* and *FINDEV,* present positive correlations with economic growth in the sample. This is a step further from Figure One above, and it indicates a positive *statistical* relationship between financial development and growth during the period investigated.

The control variables present the expected statistical signs against growth (i.e., *DEV*, *INV* and *OPEN* present positive correlations with growth, confirming that more educated and urbanised societies, as well as higher investment and more economically open societies are associated with faster growth). The proxy for government size, *GOV,* suggests that the stylised fact that bigger governments tend to be detrimental to growth is valid in the region. Finally, *POL* indicates that more politically polarised societies, or less democratic

ones, which is represented by an increase in *POL,* are associated with slower growth.

Table 1: The Correlation Matrix: Argentina, Bolivia, Brazil and Peru, 1980-2007.

	GROW	M2	FINDEV	DEV	INV	OPEN	GOV	POL
GROW	1							
M2	.209*	1						
FINDEV	.196	.593*	1					
DEV	.188*	-.069	.030	1				
INV	.216*	-.152	.072	.477*	1			
OPEN	.191*	.382*	.365*	.093	-.277*	1		
GOV	-.305*	-.160	-.439*	-.270*	-.157	-.609*	1	
POL	-.148	-.254*	-.061	-.086	.361*	-.347*	.211*	1

Sources: Penn World Table, Database on Financial Development and Structure, World Development Indicators, Barro and Lee, and Polity IV files. * represents significance at the 5% level.

Furthermore, in Figure Two we plot the OLS regression lines of *M2* and *FINDEV* against growth in Argentina, Bolivia, Brazil and Peru. What can be seen is that in both panels there is a positive and statistically significant relationship between financial development and economic growth, which preliminary indicates that there is an *economic* relationship between these variables (i.e., that more access to financial resources contributes to greater economic activity and consequently fosters growth in the region).

All the same, this initial inspection of the data, with all its caveats, suggests that finance has presented a positive relationship with growth in the region during the period investigated (i.e., the data plots suggest that *M2* and growth moved in the same direction over time, the statistical correlations amongst both measures of finance and growth are positive, and the OLS regression lines indicate a significant positive economic relationship between finance and economic growth in the panel).

This is important not only because we are able to capture particular positive comovements between finance and growth, but also because all four countries in the sample pre-

sented political transitions, as well as hyperinflationary bursts and consequently poor macroeconomic performance for a considerable period of time in the 1980s and early 1990s (not to mention that those economies were also heavily regulated). Nevertheless, overall finance has been, in one way or another, positively related to economic growth, which further highlights the potential of financial development in generating growth and prosperity in the region.

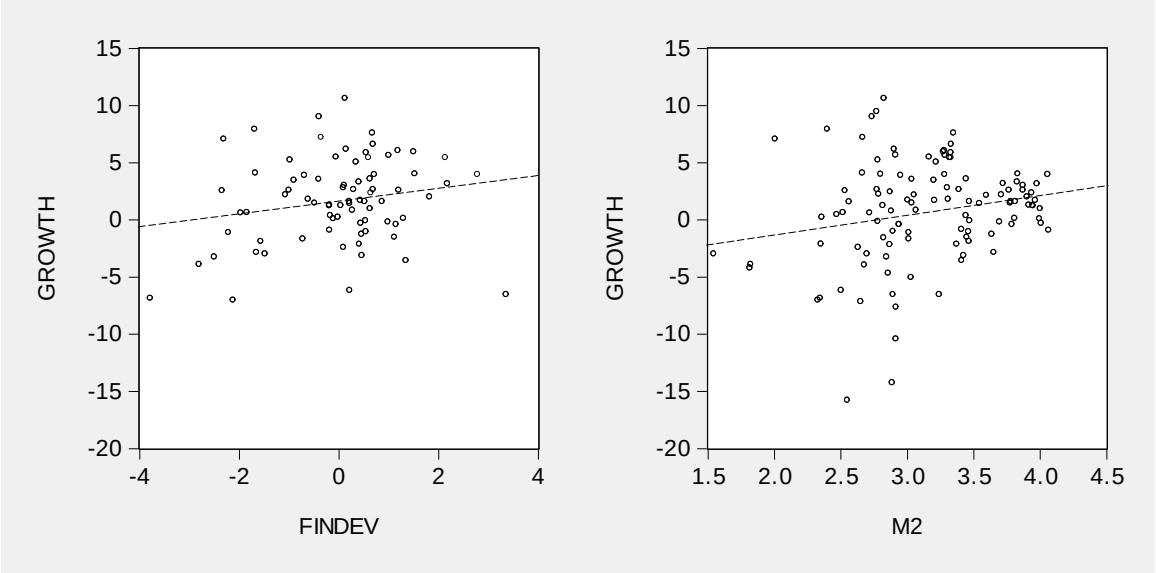

Figure 2: OLS Regression Lines, GDP Growth and Financial Development, Argentina, Bolivia, Brazil and Peru, 1980-2007. Sources: Penn World Table and Database on Financial Development and Structure files.

Empirical Strategy

In terms of econometric modelling, since we have a $T > N$ data set, the empirical strategy is based on panel time-series analysis. This is interesting because panel time-series permits us to deal not only with important econometric issues in relatively thin panels—non-stationarity, and heterogeneity and endogeneity biases—but also to further our knowledge of Latin America without having to carry out large cross-sectional or panel analyses, which usually treat the Latin American region as an outlier to be removed from the sample.

Firstly, although most of the variables used are stationary by definition, or bounded within closed intervals, for *non-stationarity* in the country time-series we use the Im, Pesaran

and Shin (IPS (2003)) test, which allows for *heterogeneous* parameters and serial correlation. The IPS test consists of an augmented Dickey-Fuller (ADF) regression for each variable of each country, and these are then averaged. The moments of the mean and variance of the average $\bar{t}$ are -1.43 and .62 respectively[8]. Equations one and two illustrate the regional ADF equations of a particular variable y and the IPS test respectively.

$$\Delta y_{it} = \alpha_i + \beta_i y_{it-1} + \sum_{j=1}^{k} \gamma_{ij} \Delta y_{i,t-j} + \delta_i t + u_{it}, \tag{1}$$

$$IPS = \frac{\sqrt{N}(\bar{t} - E(\bar{t})}{\sqrt{var(\bar{t})}}, \tag{2}$$

in which α_i is the heterogeneous intercept, $\delta_i t$ the time trend, u_{it} the residuals and N the number of regions.

Secondly, the issue of *heterogeneity* bias in *dynamic* $T > N$ panels, which is caused because with wrongly assumed homogeneity of the slopes, the disturbance term is serially correlated and the explanatory variables x_s end up not being independent of the lagged dependent variable y_{t-1}. This is firstly dealt with by the one-way Fixed Effects (FE) estimator which provides consistent estimates in dynamic models when $T \to \infty$, however it only considers heterogeneity of intercepts. Loosely speaking, if the slopes are heterogeneous then the FE estimates are to be taken cautiously since the bias generated might be severe. Secondly, we use the Swamy's (1970) Random Coefficients (RC) estimator, which assumes

[8] An alternative to IPS (2003) is the test by Levin, Lin and Chu (2002). However, this test assumes parameter *homogeneity*, and therefore does not consider a possible heterogeneity bias present in the data. Moreover, given that these countries shared some macroeconomic characteristics in the 1980s and early 1990s, some would argue that there is between-country dependence present. An alternative that considers the existence of between-country dependence is proposed by Pesaran (2007), the cross-section IPS (CIPS) test. However, CIPS assumes that $N > 10$ and we have $N = 4$ in our data set. In addition, one would argue that, given the structure of the data, structural breaks are a possibility. The test proposed by Im, Lee and Tieslau (2005) takes that into account. However, this test also assumes large N, which is not entirely the case here. Basically, the IPS test is probably slightly biased, however, it presents more flexibility in terms of sample size and asymptotics, and is therefore informative and probably the best alternative available at this stage.

heterogeneity of intercepts *and* slopes, and it provides consistent estimates of the averages as $T \to \infty$. The RC, which can also be interpreted as a Generalised Least Squares estimator, consists of a weighted average of $\hat{\alpha}_i$ and $\hat{\beta}_i$, and the weight contains a modified variance-covariance matrix of the heterogeneous α_i and β_i[9].

All in all, although these countries experienced political transitions and shared similar poor macroeconomic characteristics in the 1980s and early 1990s, these pooled estimators account for an important econometric issue—heterogeneity bias—or the fact that some of these countries do indeed present different levels of economic development (Brazil and Argentina are known to be relatively more developed than Peru and Bolivia).

Furthermore, some would argue that there is economic and statistical *endogeneity* present (i.e., finance not being totally exogenous in determining growth). For example, Robinson (1952), and Lucas (1988) cast doubt that finance leads growth, and suggest that when growth leads, finance actually follows. Hence, we use instrumental variables estimation (i.e., the Fixed-effects with Instrumental Variables (FE-IV) estimator), with robust standard errors and with the inflation rate as the identifying instrument for the measures of financial development being estimated. In essence, inflation provides finance with some exogenous variation to explain growth[10]. The estimates provided by the FE-IV estimator are asymptotically consistent and efficient as $T \to \infty$ as long as there is no correlation between the instrument set and the residual, and it retains the time series consistency even if the instrument set is only predetermined[11].

We therefore estimate static and dynamic models with different pooled estimators (i.e. the benchmark Pooled Ordinary Least Squares (POLS), FE, RC and FE-IV), so that different econometric *and* economic issues are dealt with, and more reliable and informative

[9] The Mean Group estimator, proposed by Pesaran and Smith (1995), is also an alternative. However, this estimator is sensitive to outliers, a problem not faced by the RC estimator. In addition, Bond (2002) argues that GMM-type estimators are *not* an alternative under $T > N$ for the overfitting problem.

[10] For instance, Azariadis and Smith (1996), Huybens and Smith (1999), Boyd, Levine and Smith (2001) and Bittencourt (2011) suggest, theoretically and empirically, that the main macroeconomic determinant of financial development is, in fact, inflation.

[11] For a more thorough discussion about panel time-series analysis in general, see Smith and Fuertes (2008) or Lee, Pesaran and Smith (1998).

estimates provided. The basic estimated dynamic equation is as follows

$$(3) \qquad GROW_{it} = \alpha_i + \beta FINDEV_{it} + \gamma DEV_{it} + \delta INV_{it} + \epsilon OPEN_{it} + \varepsilon GOV_{it} + \zeta POL_{it} + \eta GROW_{it-1} + \upsilon_{it},$$

in which *GROW* represents the growth rates of GDP, *FINDEV* is the proxy for financial development, which consists of the unobserved common factors of *M2*, private bank credit over bank deposits, deposit money bank claims over deposit money bank and central bank claims, and stock market capitalisation over GDP; *DEV* is the interaction between education and urbanisation; *INV* is the share of investment to GDP; *OPEN* is a measure of economic openness; *GOV* is the share of government to GDP, and *POL* is a proxy for political-regime characteristics.

Results

In terms of results, firstly we report the IPS statistics—*GROW* is -3.66, *M2* is -2.32, *DEV* is -2.56, *INV* is -2.43, *OPEN* is -2.22, *GOV* is -2.17 and *POL* is -2.69—and they all suggest that we can reject the null hypothesis of unit roots and accept in favour of the alternative that at least *one* country of each variable is stationary. This indicates that further data transformations are not needed, and it also justifies why panel-cointegration analysis is not pursued in this case.

Secondly, in Table Two—columns one, two, three and four—we report the static and dynamic baseline estimates of *M2* on growth using the POLS, FE and RC estimators respectively. Interestingly enough, apart from the POLS *M2* estimates, which are positive and significant against growth, the other *M2* estimates are *not* statistically significant, and even present the wrong (negative) sign. The two control variables presenting reasonable estimates are *INV* and *GOV,* with respectively positive and negative signs, which confirm that higher investment rates contribute to economic growth and that bigger governments tend to be detrimental to growth. Finally, the F* and Likelihood Ratio (LR) tests indicate

that there is some evidence of country fixed effects, and heterogeneity of intercepts and slopes, which justifies the use of the FE and RC estimators in this instance.

More importantly, after estimating the regression-based Hausman test and rejecting the null hypothesis of exogeneity, we can then make use of the FE-IV estimator. We report the *M2* estimates in Table Two—columns five and six—and in this case, *M2* presents clear positive and statistically significant effects on growth, which confirms early evidence about the role of the liquid liabilities in promoting economic activity and consequently fostering economic growth. For instance, for every percent increase in *M2*, growth would increase by 1.3% per year in the dynamic specification (6). Essentially, *M2*, for presenting liquid and indexed assets (e.g., Brazil and Argentina already had a well-developed indexation mechanism during the hyperinflationary period), has played an important role in providing short-run (liquid) finance to be invested in short- and long-run productive activities.

Above all, these results are also interesting in their own right because, firstly we take into account a possible economic endogeneity problem ((Robinson (1952) and Lucas (1988)) and secondly, the Hausman test indicates that there is indeed statistical endogeneity, and therefore the use of the FE-IV estimator, with inflation as the identifying instrument, is well justified on theoretical and statistical grounds in this case. In essence, *M2,* or the size of the financial sector, only becomes significantly positive against growth once we extract the variation in *M2* that is not correlated with the residual, or take into account the relevance of inflation being correlated to finance.

The controls *INV* and *GOV* continue to present their expected signs, positive and negative respectively, and the estimates are statistically significant. Furthermore, in the first-stage regressions (available upon request) the F test for overall significance indicates that we can reject the null hypothesis. The identifying instrument, *INFL,* presents negative and significant effects on *M2*, which firstly minimises the possibility of a weak instrument, and secondly suggests that the poor macroeconomic performance of the 1980s and early 1990s had not only a detrimental effect on financial deepening, but also serious negative indirect effects on growth. For instance, for every percent increase in *INFL*, *M2* would

decrease in .11% in (6), which considering the inflation rates seen in those countries in the 1980s and early 1990s, would represent a significant reduction in the amount of liquid finance in those economies and consequently on growth.

Table 2: POLS, FE, RC and FE-IV Estimates of Finance on Economic Growth, 1980-2007.

Static and Dynamic Models						
GROW	POLS (1)	FE (2)	FE (3)	RC (4)	FE-IV (5)	FE-IV (6)
M2	1.37 (1.71)	-.252 (-.21)	-.428 (-.35)	-.691 (-.46)	16.15 (2.18)	13.79 (2.04)
DEV	-.000 (-.01)	.013 (.86)	.011 (.75)	.019 (.66)	-.023 (-.77)	-.019 (-.72)
INV	.285 (2.26)	.463 (2.79)	.296 (1.65)	.515 (1.08)	.590 (2.10)	.475 (1.65)
OPEN	.014 (.35)	-.023 (-.18)	-.026 (-.21)	-.175 (-.65)	-.631 (-1.85)	-.545 (-1.77)
GOV	-.225 (-1.37)	-.370 (-1.82)	-.375 (-1.83)	-.734 (-2.83)	-.998 (-2.30)	-.864 (-2.24)
POL	-.604 (-1.50)	-.494 (-1.20)	-.445 (-1.08)	-.736 (-1.03)	-1.08 (-1.49)	-.888 (-1.33)
$GROW_{-1}$			.222 (2.22)	-.031 (-.24)		.167 (1.07)
F test	3.89	5.52	5.58			
F* test		2.97	1.94		1.80	1.50
R^2	.18	.08	.13			
LR test				18.92		
Hausman					-4.37	-3.56
Wald test				42.86	17.96	22.10
IV					Inflation	Inflation

T-ratios in parentheses. Number of observations: $NT = 112$. The basic estimated equation is $GROW_{it} = \alpha_i + \beta M2_{it} + \gamma DEV_{it} + \delta INV_{it} + \epsilon OPEN_{it} + \varepsilon GOV_{it} + \zeta POL_{it} + \eta GROW_{it-1} + \upsilon_{it}$, in which *GROW* is the growth rate of the GDP, *M2* is the baseline proxy for financial development, *DEV* is the interaction between education and urbanisation, *INV* is the share of investment to GDP, *OPEN* is a measure of economic openness, *GOV* is the share of government to GDP, and *POL* is a proxy for political regime characteristics. The identifying instrument in (5) and (6) is *INFL*. POLS is the Pooled Ordinary Least Squares, FE is the Fixed Effects, RC the Random Coefficients and FE-IV the Fixed Effects with Instrumental Variables estimators.

Thirdly, in Table Three—columns one, two, three and four—we report the static and dynamic estimates of *FINDEV* on *GROW* using the POLS, FE and RC estimators. The *FINDEV* estimates are *not* statistically significant in this case either. Just as before, the control variables presenting reasonable estimates are *INV* and *GOV,* with respectively positive and negative signs, which suggest again that higher investment causes growth and that bigger governments tend to crowd out economic activity. There is also evidence of heterogeneity of intercepts and slopes, which justifies the use of the RC estimator in the dynamic instance.

In addition, after estimating the Hausman test and rejecting the null hypothesis of exogeneity, we are then able to make use of the FE-IV estimator. The *FINDEV* proxy presents clear positive and statistically significant effects on growth, which highlights the role that financial development in general can have in providing all sorts of finance and consequently generating economic growth in the region. In this case, for every percent increase in *FINDEV*, growth increases by .30% per year in the dynamic specification (6). Just as before, this is also important because financial development only becomes significant once we account for economic and statistical endogeneity, and therefore extract the variation in *FINDEV* that is not correlated with the residual, or when we take into consideration the role of inflation on finance.

The controls *INV* and *GOV* continue to present their expected signs, positive and negative respectively. However these estimates are not entirely statistically significant this time. Furthermore, in the first-stage regressions (which are available on request) the F test is statistically significant and *INFL* presents negative and significant effects on *FINDEV*. For instance, for every percent increase in *INFL*, *FINDEV* decreases by .49% per year in (6). All in all, the above significance levels not only minimises the possibility of a weak instrument, but also highlights again the detrimental effect of the high inflation seen in the 1980s and early 1990s on financial development and indirectly on growth in the region.

Table 3: POLS, FE, RC and FE-IV Estimates of Finance on Economic Growth, 1980-2007.

Static and Dynamic Models						
GROW	POLS (1)	FE (2)	FE (3)	RC (4)	FE-IV (5)	FE-IV (6)
FINDEV	.013 (.04)	-.068 (-.13)	.013 (.03)	-1.16 (-1.28)	5.00 (2.24)	3.02 (2.05)
DEV	-.002 (-.86)	-.012 (-.67)	-.014 (-.82)	-.009 (-.22)	-.077 (-1.96)	-.052 (-1.88)
INV	.270 (1.96)	.255 (1.40)	-.000 (-.00)	.385 (.86)	.504 (1.69)	.125 (.53)
OPEN	.001 (.04)	.087 (.65)	.022 (.18)	.080 (.23)	-.074 (-.34)	-.078 (-.48)
GOV	-.379 (-2.09)	-.493 (-2.30)	-.570 (-2.86)	-.872 (-.90)	-.437 (-1.33)	-.543 (-2.18)
POL	-.765 (-1.18)	-.594 (-.88)	-.606 (-.97)	-2.56 (-.80)	-.580 (-.56)	-.599 (-.76)
$GROW_{-1}$			.380 (3.53)	-.000 (-.00)		.412 (3.04)
F test	3.19	2.67	4.46			
F* test		.48	.20		1.67	1.47
R^2	.21	.10	.15			
LR test				59.49		
Hausman					-3.91	-2.57
Wald test				25.14	19.42	37.47
IV					Inflation	Inflation

T-ratios in parentheses. Number of observations: $NT = 112$. The basic estimated equation is $GROW_{it} = \alpha_i + \beta FINDEV_{it} + \gamma DEV_{it} + \delta INV_{it} + \epsilon OPEN_{it} + \varepsilon GOV_{it} + \zeta POL_{it} + \eta GROW_{it-1} + \upsilon_{it}$, in which *GROW* is the growth rates of the real GDPs, *FINDEV* is the proxy for financial development, *DEV* is the interaction between education and urbanisation, *INV* is the share of investment to GDP, *OPEN* is a measure of economic openness, *GOV* is the share of government to GDP, and *POL* is a proxy for political regime characteristics. The identifying instrument in (5) and (6) is *INFL*. POLS is the Pooled Ordinary Least Squares, FE is the Fixed Effects, RC the Random Coefficients and FE-IV the Fixed Effects with Instrumental Variables estimators.

In a nutshell, the estimates reported above indicate that financial development played an important role in providing financial resources to be channeled to all sorts of productive

activities and consequently generating economic growth in a region which was plagued by macroeconomic mismanagement and poor economic performance during and immediately after their political transitions in the 1980s and early 1990s. However, the positive effect of finance on growth only surfaces once we take into account the economic and statistical endogeneity seen between finance, growth and the macroeconomic performance seen at the time (i.e., inflation is confirmed as the main macroeconomic driver behind finance, which in turn affects economic growth).

Ultimately, what is stressed here is not only the importance of extra financial resources in financing productive activities, even in societies experiencing severe political and macroeconomic conditions, but also the need for macroeconomic stability in terms of low inflation rates. Certainly the effect of financial development in promoting growth would be larger without the hyperinflationary episodes seen in those countries in the 1980s and early 1990s. In effect, the lack of particular economic institutions in the 1980s and early 1990s (central bank independence, fiscal responsibility laws, inflation targeting, better coordination between monetary and fiscal authorities), contributed to a reduction not only in the size of the financial sector, but also in the activity of financial intermediaries in allocating credit to potential entrepreneurs, and therefore in growth and prosperity in the region.

Concluding Observations

We investigated in this paper the role of financial development, or more widespread access to finance, in promoting economic growth in a panel of Latin American countries which experienced political transitions in the 1980s and severe macroeconomic conditions in the 1980s and early 1990s. The results, based on panel time-series analysis, suggest that, once we take into account the role of macroeconomic performance, financial development indeed played a significant role in generating economic activity, innovation and consequently economic growth in the region, or alternatively stated: Schumpeter is right after all! Nevertheless, it must be pointed out that the positive effects of financial development on growth could be even larger had those countries not allowed those hyperinflationary episodes to

happen in the first place. However, those countries simply did not have the right institutional framework in place in the 1980s (central bank independence, fiscal responsibility laws and financial de-regulation were implemented only in the 1990s).

The quality of the evidence presented is, to a certain extent, boosted not only because we carry out a case study on those Latin American countries which experienced political transitions and poor macroeconomic performance, but also because we use principal component analysis in an attempt to deal with model uncertainty in growth regressions. Furthermore, we avoid the averages and take advantage of panel time-series analysis, so that we are able to explore the annual variation and deal with particular economic and statistical issues not covered by the previous studies. This can be interpreted as a step forward in terms of achieving better and more informative estimates on the subject in Latin America. All in all, with panel time-series we can specifically study the idiosyncrasies of Latin America without treating the region as an outlier to be removed from the sample, as done in some of the previous large cross-sectional and panel studies.

Moreover, the importance of carrying out a historical study on the subject of financial development and growth is mainly because developing countries can indeed benefit from finance. However finance needs the right framework to thrive (i.e., good macroeconomic performance and all the economic institutions that generate that, such as central bank independence and sound fiscal authorities, must be in place as necessary conditions for development)[12]. Furthermore, it can be reasonably said that the financial liberalisation (or de-regulation) taking place in those countries in the 1990s, or the introduction of more competition in the financial sector, has played a positive role in widening access to finance after the stabilisations of the 1990s. All in all, the institutional reforms that those countries implemented in the 1990s (with the implementation of inflation targeting by more independent central banks, fiscal responsibility laws (at regional and federal levels), and more competition in the financial sector) seem to have paid some dividends in terms of creating

[12] For instance, Singh (2006), Singh and Cerisola (2006) and Santiso (2006) highlight the importance of the much improved macroeconomic performance in Latin America recently in producing better economic outcomes from the 1990s onwards. Nevertheless, Carstens and Jácome (2005) warn that Brazil still has one of the least independent central banks in Latin America, which is always a cause for concern.

the necessary pre-conditions for a more efficient and active financial sector which in turn has the ability to generate sustained economic growth.

Above all, given the current debates in developing countries like Argentina and South Africa about the efficacy and even legitimacy of particular economic institutions in conducting monetary and fiscal policies, and also about the role of financial market liberalisation, it is important that policy makers and particular stakeholders have clear in their minds the costs that macroeconomic mismanagement and financial closeness can have on economic welfare in general (via a reduced and less active financial sector).

About future work, the role of the financial liberalisation that took place, in particular in Argentina and Brazil, in widening the access to finance is something that can be investigated more formally. In addition, a comparison between these four Latin American countries and the four Asian Tigers, which presented macroeconomic stability combined with financial development and sustained economic growth, would certainly enrich this sort of analysis further[13].

To conclude, financial development played the role that Schumpeter predicted in promoting innovation and growth in Latin America, even under severe political and economic conditions. Nevertheless, these positive effects could have been even more significant had these countries implemented particular economic institutions, like central bank independence and fiscal responsibility laws, at the time of their political transitions in the 1980s[14]. All in all, financial development matters (the current crisis testifies to the fact that liquidity is of paramount importance for economic activity); so do financial openness and macroeconomic stability as necessary conditions and pre-conditions for more fundamental growth determinants like finance to thrive and therefore for sustained prosperity in the region. For the latter the governments of those countries certainly achieved the necessary political maturity to implement and keep in place the necessary economic institutions and policies that

[13] Yang and Yi (2008) find that financial development indeed caused growth in Korea between 1971 and 2002, coincidentally enough the very period in which Korea has taken off in terms of development.

[14] For instance, Bittencourt (2010) suggests that, because of the distributional conflict, some populist tendencies and lack of particular economic institutions, some Latin American countries that transitioned from dictatorship to democracy in the 1980s suffered from poor macroeconomic performance during their transitional periods.

provide a stable macroeconomic environment. For the former, those governments implemented the necessary incentive mechanisms (de-regulation, openness and competition) so that more active and dynamic financial sectors have emerged. Finally, it is also important that, under the current economic situation, those countries keep what has been implemented in terms of incentives and macroeconomic policies, instead of falling prey to unnecessary closeness, regulation and macroeconomic populism, so prevalent in the region in the past. After all, Schumpeter is right!

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