The Conundrum of Low Saving Rates in Latin America

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Despite extensive economic reforms during the late 1980s/early 1990s, Latin America's saving rates remain low. This article examines the saving behaviour of 18 Latin American countries in the 1976-2000 period and compares it with that of 25 other developing countries. It finds that lower inflation, income growth and increased real interest rates on deposits have not had the expected effects on saving rates in Latin America. Instead, the determinants of saving behaviour appear to differ between the two groups of countries, and saving rates are affected by a degree of inertia. Although more research is needed, this indicates that the focus of the neoliberal economic reforms of the 1980s was misplaced.

Key words: Latin America, neo-liberal reforms, saving rates, economic growth, liberalisation

1 Introduction

This article looks at the saving behaviour of 18 Latin American countries in the period 1976-2000, compared with a group of 25 other middle-income developing countries. Over this period, Latin American saving rates have been consistently below those of the comparison group. This has been the case despite extensive economic reforms undertaken in the Latin American region during the late 1980s/early 1990s designed to improve saving performance. While the reformers expected lower inflation, increased deposit rates and greater macroeconomic stability to stimulate increased saving, this has not occurred. The study shows that, unlike in the control group, these factors are not significant determinants of saving behaviour in Latin America. We must look elsewhere for policy reforms that might stimulate regional saving.

Why is saving important? The role of saving in the process of economic development has long been a fundamental axiom of development theory, with its basis in such classic analyses as Rostow's (1960) stages of growth and Lewis's (1965) growth theory and the early growth models of Harrod-Domar and others. In these analyses, an increase in the rate of saving was identified as a key factor underlying a nation's ability to achieve a sustained increase in its growth rate. Recent theoretical and empirical work (Lucas, 1988; Mankiw et al., 1992; Gavin et al., 1997; Loayza et al., 2000) reiterates the presumed correlation between domestic savings and growth. Although external savings may compensate for limited domestic savings, an increased reliance since the late 1980s on international capital flows has contributed to greater economic instability in the Latin

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American region (Summers, 1996; Stallings and Peres, 2000: Ch. 2), and has generally reduced domestic savings (Gavin et al,, 1997; Bresser-Pereira and Nakano, 2002), underlining the importance of increased internal savings capacity.

Not surprisingly, the critique of economic policies in the Latin American-Caribbean region (LAC) during the heyday of the import-substitution industrialisation (ISI) model focused heavily on saving behaviour. The removal of the perceived impediments to saving was one of the principal stated objectives of the economic reforms implemented in LAC and in other developing countries in the 1980s and '90s. This article explores the behaviour of saving in LAC in order to answer the following questions. First, how does the level of saving in LAC compare with that of other developing countries before and after the reforms? Second, how does the responsiveness of LAC saving behaviour to a number of potential determinants of saving compare with that of other developing countries? It focuses on the key factors emphasised by reformers: inflation, stability and interest rates.

The results reported here extend the literature on Latin American saving behaviour in terms of both the countries included in the study and the time period covered. Although most studies of LAC saving, and more generally of reform outcomes in the region, use data from the 1970s to 1994 or 1995 (Gavin et al,, 1997; IDB, 1997; Burki and Perry, 1997; Dayal-Gulati and Thimann, 1997), the data used here cover the period from 1976 to 2000. The study employs a wider sample of LAC countries than many other studies, and also uses a somewhat different comparison group, as discussed below.

2   Latin American saving performance

As a first step in assessing saving behaviour in Latin America, average saving in an 18-country LAC group was compared with that in a comparison group of 25 developing countries. The data were divided into three periods. The first, 1976-81, precedes the international financial crisis that enveloped developing countries in the early 1980s. During the second period, 1982-90, many developing countries were coping with serious financial crises and were beginning to implement financial liberalisation reforms. By the beginning of the third period, 1991-2000, the general financial crisis of the 1980s had come to an end and most developing countries were implementing significant financial reforms.

The countries included in the analysis were selected based on income and availability of data. Latin America is predominantly a 'middle-income' region, according to the World Bank's income classification system. The 18 LAC countries included here were middle-income during most of the 1975-2000 period.[1] The comparison group (OTHER) consists of 25 developing countries that were middle-income during at least some of the period, and for which relevant data were available.[2] Unlike some other recent studies, this gives us a large enough sample to be able to

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1. The LAC countries are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Panama, Peru, Paraguay, Uruguay and Venezuela.
2. Other countries are Algeria, Botswana, Cameroon, Congo, Côte d'Ivoire, Egypt, Gabon, Indonesia, Jordan, Malaysia, Mauritania, Mauritius, Morocco, Nigeria, Papua New Guinea, Philippines, Singapore, South Africa, South Korea, Sri Lanka, Syria, Thailand, Tunisia, Turkey and Zimbabwe.

investigate saving behaviour empirically rather than use a case-study approach. At the same time, while numerous studies have expanded their sample by including both developed and developing countries, theory and evidence suggest that there are important differences between saving behaviour in developed and developing countries (see, for example, Masson et al., 1998). Similarly, while some studies have included low-income countries in their sample, Ogaki et al. (1996) have demonstrated that saving rates differ significantly between low and lower-middle-income countries, but that the gap decreases as we move to higher income groups. By focusing here on middle-income countries, we reduce some of the behavioural differences associated with a wider income range.

Table 1 presents gross domestic savings (GDS) as a percentage of gross domestic income and net national savings (NNS) as a percentage of gross national disposable income for the two country groups. While private saving rates would be most desirable, the available data series ends in 1994. Since economic reforms in LAC were implemented primarily in the late 1980s and early 1990s, we need a longer period of time to explore saving performance in the post-reform period. For comparison purposes, however, Table 1 also presents the available data on gross private saving (GPS).[3]

Table 1: National and private saving rates in LAC and OTHER country groups

NNS	1976-81	1982-90	1991-94	1991-2000
LAC	12.21	8.19	8.88	8.88
OTHER	15.39	14.32	15.80	15.07
LAC/OTHER	*0.79*	*0.57*	*0.56*	*0.59*
GDS				
LAC	20.58	18.52	17.11	17.10
OTHER	21.56	22.39	23.97	24.81
LAC/OTHER	*0.95*	*0.83*	*0.71*	*0.69*
GPS				
LAC	17.29	15.88	14.18	
OTHER	17.86	17.55	19.37	
LAC/OTHER	*0.97*	*0.90*	*0.73*	

Source: Calculated from data in World Bank (1998; 2005).

By all measures, saving rates in LAC were lower than in the comparison group in all three periods. The gap in NNS increased significantly in the 1980s as saving rates fell sharply in LAC but only modestly in OTHER countries. In the 1990s, average NNS in OTHER countries returned close to the pre-crisis level, but remained depressed in LAC despite the financial reforms in the region. As a result, average NNS in LAC in the 1990s has been only 73% of its 1976-81 level, and only 59% of the 1990s level in the OTHER developing countries.

With respect to GDS and GPS, although the average rates in LAC have consistently been below those of the OTHER group, it is interesting to note that there

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3. Private and national saving data are from the World Bank's World Saving Data Base. For a description of this database, see Loayza et al. (1998).

was only a very slight gap in the 1970s. As with NNS, the gross saving gaps have grown steadily through the 1980s and 1990s as gross saving rose in the OTHER countries but continued to decline in LAC. Indeed, while LAC NNS in the 1990s was above the 1980s level, if only very slightly, GDS continued to fall. As with NNS, GDS in LAC is the same for 1991-94 as for the entire decade.

Whether we look at private, net national or gross domestic saving, it is clear that LAC saving rates have been depressed in the 1990s compared with the 1970s, and that the gap between LAC and OTHER is greater in the 1990s. Given the lack of data on private saving after 1994, it is reasonable to focus our attention on the relative behaviour of national saving. In particular, we explore the determinants of saving emphasised in the 1980s and '90s, how those factors have varied over this period, and how they have affected saving behaviour in LAC and in the comparison group. In the next section, we review the relevant theoretical and empirical literature on the determinants of saving, including those few studies that have focused on LAC saving behaviour.

3   The determinants of saving

While there is general agreement among development economists on the important role of saving in economic growth, there has been considerable debate over the appropriate economic policies to promote saving and its deployment into growth-generating investment. There are two strands to this debate in the development literature: the 'structuralist-monetarist' debate focusing on Latin American economic policy, and the 'financial-repression' literature concentrating mainly on East Asia.[4]

In the 1960s and 1970s, the monetarist criticisms of ISI in Latin America focused heavily on the inflationary impact of excessive government spending under ISI. Critics argued that, among other negative consequences, inflation contributed to lower real rates of interest and thereby deterred private saving in the region. A lesser element in the critique was the argument that government controls over financial market operations (entry restrictions, interest-rate ceilings, etc.) reinforced these effects. Low saving rates resulted in lower investment in the region and therefore lower growth, as well as being one of the causes of excessive international debt and balance-of-payments disequilibria. This inflation critique was contested by 'structuralist' ISI supporters, who contended that moderate inflation[5] and lower real lending rates created necessary incentives for investment under conditions of underdeveloped markets, characterised by bottlenecks and cost-push pressures on prices. Higher investment led to higher rates of economic growth and therefore higher savings in the long run.

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4. A good summary of the monetarist-structuralist debate is provided by Sheahan (1987: Ch. 5). The classic statements of the financial-repression position are by McKinnon (1973) and Shaw (1973); see the summary of this position and its critics in Chowdhury and Islam (1993: Ch. 8).
5. Average inflation for 1960-69 for 17 of the LAC countries included in this study was 11.2% (Cardoso and Helwege, 1992: 141). However, only 5 countries had inflation above 10% for this period, and the average for the other 12 countries was 3.0%. The situation changed markedly in the 1970s, when average inflation for the 17 countries rose to 32.5%, 11 countries had inflation over 10%, and the average for the other 6 countries was 7.8%. This dramatic increase in inflation gave added weight to the monetarist position, while structuralists emphasised the role of imported inflation due to rising oil prices.

While the monetarist analysis emphasised the negative effects of inflation on saving and growth, inflation has generally not been a concern in the East Asian region. There, the debate has centred instead on government controls over nominal interest rates, financial instruments, and credit allocation. Critics argued that these controls, or financial 'repression', created disincentives for saving and therefore a shortage of credit. This, in turn, resulted in further government intervention to ration the scarce credit to selected borrowers. Financial markets needed to be liberalised to increase the volume of savings and its channelling to productive investment. Critics of the financial-repression position, on the other hand, argued that the developing countries of East Asia were characterised by pervasive market failure, with wide disparities between private and social returns. As a result, the governments of East Asia were more successful than the financial markets would have been at allocating credit to growth-promoting investments.

Despite the continuing debate over the monetarist and financial-repression arguments, the mid-1980s' reform proposals for the Latin American region combined recommendations from both analyses. The reforms included policies such as fiscal-deficit reduction and trade liberalisation to combat inflation, and financial liberalisation measures to promote efficient financial markets. According to Balassa, one of the main proponents of the reforms:

> … a key part of the strategy is the adoption of new measures to promote higher levels of savings and more efficient investment patterns … A central element in the proposed approach is to assure that *real interest rates remain sufficiently positive* to induce a stable and substantial level of domestic savings and keep most of those savings at home, but not so high as to discourage productive investment (1986: 28-9; emphasis in original).

Another recommended measure was the reduction in budget deficits that 'generate rapid rates of inflation which … discourage savings and distort investment patterns' (ibid: 29-30). A general increase in economic stability and growth in the region would also, in theory, increase confidence and therefore encourage saving.

In sum, reformers argued that lower inflation, increased real deposit rates, and greater macroeconomic stability and growth would each stimulate saving.[6] However, the theoretical and empirical literature does not unambiguously support these hypotheses.

The impact of higher real deposit rates on saving is unclear, as the substitution and wealth effects work in opposite directions. While higher deposit rates increase the return to saving, they also make it possible for households to meet objectives with a lower volume of savings. As Fry (1995) shows in his review of the literature, the extensive empirical findings on the relationship between interest rates and saving are quite mixed and generally insignificant (see also Giovannini, 1985; World Bank, 1987; Khatkhate, 1988; Gonzales Arrieta, 1988). More recently, Loayza et al. (2000) have found a

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6. Financial liberalisation could lead to financial deepening, which might also stimulate saving. Studies have commonly used the money supply (ratio of M2 to GDP) as a measure of such financial deepening. However, the emphasis of reform architects in Latin America was on the reduction of the money supply (through fiscal-deficit reduction) as a fundamental element in controlling inflation.

significant negative relationship between the real interest rate and private saving for their large sample of both developing and developed countries, although for national saving the coefficient is insignificant. Masson et al. (1998), on the other hand, find a significant positive relationship between the real interest rate and private saving for industrial countries and an insignificant negative relationship for developing countries. Edwards (1995) also found an insignificant negative relationship for 25 developing countries, as well as for a broader sample of 25 developing and 11 industrial countries. Bandiera et al. (2000), in their study of financial reforms in 8 developing countries, found no clear relation between private savings and real interest rates. In some specifications for some countries the results are negative and significant, but they are insignificantly negative or even positive in other cases. Gupta (1987) looks at the relationship between nominal interest rates and saving, and finds a significant positive relationship for 9 Asian countries, but no significance for 13 Latin American ones.

In addition to its effect on real interest rates, inflation may affect saving behaviour through other channels. One frequently mentioned in the literature is the uncertainty that an inflationary climate may create. Indeed, numerous studies have used inflation as a measure of macroeconomic instability. Here again, however, the effect on saving is not clear. On the one hand, uncertainty about inflation may cause households to accelerate purchases to avoid possibly higher future prices. On the other hand, uncertainty over future economic conditions may cause households to increase precautionary saving. Lowering inflation, especially through exchange-rate policies (Gavin et al., 1997), may lead to a consumption boom and lowered saving.

Not surprisingly, the findings are mixed. Loayza et al. (2000) find a significant positive relationship between inflation and both private and national saving in their combined industrial/developing country sample for their preferred estimator. Masson et al. (1998) similarly find a significant positive relationship between inflation and private saving for industrial countries, but a significant negative relationship for developing countries. Gavin et al. (1997) find a significantly positive effect of inflation on saving for their sample of 6 East Asian and 20 Latin American countries, when lagged effects are taken into account. For their 8 developing countries, Bandiera et al. (2000) find one significantly positive relationship, two or three significantly negative relationships depending on the specification, and the rest insignificant. Edwards (1995) finds no significant relationship for either the developing-country or the mixed-country sample. Finally, Gupta (1987) finds a significantly positive relationship between unanticipated inflation and saving for the Asian countries, but a negative relationship for the Latin American ones.

It is also possible that the level of inflation is less important than its volatility. Households in countries with moderate but stable levels of inflation, such as was common in many Latin American countries in the 1960s and 1970s, may have incorporated this into their expectations, whereas changes in the level of inflation may create uncertainty. For this reason, it may well be that the volatility of inflation is a better measure of uncertainty than its level. Dayal-Gulati and Thimann (1997) use inflation volatility as their measure of macroeconomic stability, and find that it is significant and negatively related to private saving rates in the 1975-95 period for their overall sample of 5 South-East Asian and 9 Latin American countries. Interestingly, however, they find that while this relationship also holds separately for the group of

Latin American countries (although the effect is very slight), the coefficient for the Asian countries is positive and insignificant.

Reformers expected that the reforms would accelerate economic growth and raise income per capita in the region. The relationships between income and saving and between growth and saving in developing countries have also been extensively investigated. Numerous recent studies have found a significant positive relationship between growth and saving, including Gavin et al. (1997) for their 26 East Asian and Latin American countries, Edwards (1995) for both the developing-country and the mixed-country sample, Masson et al. (1998) for a sample of 40 developing countries, and Loayza et al. (2000) for their large sample of developed and developing countries. Similarly, a number of recent studies have found a significant positive relationship between real income level and saving (Edwards, 1995; Dayal-Ghulati and Thimann, 1997; Gavin et al., 1997; Loayza et al., 2000). However, Bandiera et al. (2000) find a significant positive relationship for only 5 of their 8 developing countries, and ECLAC (2007) finds either no significant relationship or a significant negative relationship between income level and national saving, depending on the regression specification, for a group of 9 Latin American countries during the 1990-2003 period.

One complicating factor is that, with respect to both the income-saving and growth-saving relationships, the direction of causality is open to question. A few studies have attempted to establish the direction of causality for the growth-saving relationship. Carroll and Weil (1994) find a positive Granger causality of growth on saving for a large sample of countries, but not vice versa. Gavin et al. (1997) find a positive Granger causality of growth on saving in a sample of Asian countries.

4   Empirical findings

While the literature has identified various potential determinants of saving, we limit the analysis here to those key variables that were emphasised in the reform proposals: inflation, interest rates, income and macroeconomic stability. First, we examine the extent of financial reform in Latin America, and show that these reforms had the expected effects on the region's inflation and interest rates. Second, we use panel data to investigate empirically the relationship between the key variables and saving behaviour in the two groups of countries.

Financial reforms were extensively implemented in Latin America in the 1980s and early 1990s. The most comprehensive measure of the extent of structural-reform implementation in the region is the set of indices constructed by researchers at the Economic Commission for Latin America and the Caribbean covering the period 1970-95 (Morley et al., 1999). They calculated separate indices for five areas of reform (trade liberalisation, financial liberalisation, capital account liberalisation, privatisation, tax reform) and a general reform index measuring the composite reform effort. The range for each index is 0 (no reform) to 1 (highest reform effort). The general index rose steadily after the crisis of the early 1980s, increasing from 0.533 in 1984 to 0.821 in 1995, reflecting the intense reform effort throughout the region.

Trade and financial liberalisation reforms were the most extensively implemented, with the region's trade liberalisation index rising from 0.646 in 1984 to 0.946 in 1995, and the financial liberalisation index increasing from 0.441 to 0.927 over the same

period. Interest rates were liberalised in 15 of our 18 sample countries by 1990, with two others liberalising rates in 1991 and the last in 1992 (IDB, 1997: 45).[7] Policies aimed at reducing inflation, such as fiscal restraints, were also implemented extensively. Fiscal deficits were eliminated in most countries.[8]

As Table 2 shows, inflation in our group of Latin American countries fell as expected. Data for LAC are presented with and without Brazil, a late reformer, because of the extreme levels of some of the variables in that country. Indeed, for the 1990s, Brazil's average inflation of 549% causes the region's average to jump from 21.9% to 51.2%. If we exclude Brazil, the 1991-2000 average of 21.9% for the other 17 countries was below their 1976-81 average of 33.2%, as expected by the reformers. According to Ramos (2000), overall inflation in the Latin American region had fallen to 10% by the late 1990s, winding up below its 1945-80 average of 20%.

Table 2: Inflation and interest rates for LAC and OTHER country groups[a]

Inflation rate	1976-81	1982-90	1991-2000
LAC w/ Brazil	37.03	266.57	51.20
LAC w/out Brazil	33.22	242.79	21.90
OTHER	13.64	10.70	11.83
NDR			
LAC w/ Brazil	48.12	345.76	81.01
LAC w/out Brazil	39.07	245.96	20.38
OTHER	7.32	10.61	12.33
RDR			
LAC w/ Brazil	-3.27	-0.53	3.35
LAC w/out Brazil	-4.18	-5.09	1.02
OTHER	-4.95	0.11	0.90

Note: a) averages for available years; real deposit rates calculated for years with both nominal interest rate and inflation data.

Source: Calculated from IMF (2005).

Table 2 also gives data on average interest rates for our 18 LAC countries and the comparison group. Although the inflation data are quite extensive, there is a paucity of data on nominal deposit rates (NDR) especially for the 1970s. Real deposit rates (RDR) were calculated for years with both inflation and NDR data, using the formula $(1+NDR)/(1+inflation)$. Interestingly, while the LAC RDR was negative in the 1970s, this was also the case for our comparison group. In fact, while average LAC inflation for each period was higher than in the OTHER countries – dramatically so in the 1980s

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7. Despite devoting considerable attention to determining the extent of financial reform in the region, this study, one of the most comprehensive assessments of the LAC reforms, did not consider saving outcomes at all, focusing instead on productivity and growth. Other major studies of the LAC reforms have also paid surprisingly little attention to saving outcomes (Burki and Perry, 1997; Stallings and Peres, 2000; Reinhardt and Peres, 2000).

8. A reduction in fiscal deficits may have contradictory effects on national saving. On the one hand, such reductions would be expected to reduce inflation and thereby promote saving. On the other hand, an increase in public saving might displace private saving. One recent study of 13 developing countries, however, has found that this displacement was less than unity, so that an increase in public saving would be expected to result in an increase in overall national saving (Corbo and Schmidt-Hebbel, 1991).

– the same was true of NDR. As a result, the average LAC RDR was *above* that of the OTHER countries for the pre-crisis period 1976-81 as well as the post-reform period of the 1990s, although the gap excluding Brazil was small. While the average RDR rose to a slightly positive level in the 1980s for the OTHER countries, it remained negative in LAC. As expected by the reformers, however, it became positive for LAC in the post-reform period.

While inflation fell and interest rates rose in LAC after the reforms, we have seen that the relationship between these factors and saving behaviour is not obvious. Using panel data, we investigate the relationship between the key factors and gross domestic saving for the pooled sample of LAC and OTHER countries, and separately for each group. Gross domestic saving (GDS) is measured as a percentage of gross domestic income, and was obtained from the World Bank's World Saving Database Rev. 3.0. Other variables are obtained from the World Bank's World Development Indicators (WDI), the IMF's *International Financial Statistics* (IFS), the International Labour Organization's *Yearbook of Labour Statistics* (ILO), and the Economic Commission for Latin America and the Caribbean's *Statistical Yearbook for Latin America* (ECLAC) as indicated below. The equation for the full sample is:

$$GDS = \alpha + \beta_{1i}(X_i) + \beta_{2j}(Z_j) + e \tag{1}$$

and for the separate tests for LAC and OTHER:

$$GDS = \alpha + \beta_{1i}(X_i) + e \tag{2}$$

where X_i are the following independent and dummy variables: *ln real income per capita* (calculated from WDI data); *annual percentage change in real income per capita* (calculated from WDI data); *ln inflation* (calculated from IFS data); *annual percentage change in inflation* (calculated from IFS data); *real deposit interest rate* (calculated from nominal deposit rate and inflation data, IFS); *unemployment rate* (ILO, WDI, ECLAC); *dummy variable for 1982-1990*. And Z_j are the *dummy variable for LAC* and the *interaction variables* for each of the X independent variables and LAC.

While the level of real income per capita is commonly included in saving estimations, we also include its annual percentage change in order to capture any effects of economic growth (or recession) on saving behaviour. Similarly with inflation: as noted above, changes in the level of this variable may be as important as the level itself.

In a departure from other studies, we also include an unemployment variable. While periods of economic instability may affect saving behaviour, we hypothesise that these episodes are more likely to result in dis-saving when they are accompanied by higher levels of unemployment. Similarly, economic growth accompanied by persistently high or rising levels of unemployment, a striking feature of economic performance in many Latin American countries since the early 1990s, may not increase saving as much as expected. The decade dummy was included to test for a possible shift in the saving function in the crisis period of the 1980s. The dummy variable for LAC

and the LAC interaction terms are included to test for different intercept and slopes for LAC versus OTHER countries.[9]

The data cover the period from 1976 to 2000, although the panel is unbalanced (not all data are available for every year for every country). In addition, the inclusion of unemployment in the specification reduces the number of countries in the comparison group from 25 to 19. Table 3 summarises the data means and deviations for each group.[10]

Table 3: Variable means/standard deviations

Group (# countries)	ALL (37)	OTHER (19)	LAC (18)
Variable	Mean (*Std Dev*)	Mean (*Std Dev*)	Mean (*Std Dev*)
Gross domestic saving	21.39852	26.58767	17.96133
	(*9.576531*)	(*11.13131*)	(*6.400685*)
Log income per capita	7.569671	7.566924	7.57149
	(*0.7688786*)	(*0.9803574*)	(*0.5902918*)
Annual growth of p.c.	0.0402315	0.0415295	0.0393718
income (% chg)	(*0.1134513*)	(*0.0977110*)	(*0.122918*)
Log inflation	0.2495762	0.1155884	0.3383269
	(*.4702868*)	(*0.1435571*)	(*0.5785155*)
Annual % change in	0.2909528	0.4762386	0.1682232
inflation	(*3.839272*)	(*5.772030*)	(*1.570127*)
Real deposit rate	2.567333	1.522673	3.259295
	(*27.57105*)	(*6.094200*)	(*35.20707*)
Unemployment rate	8.723985	7.58301	9.502572
	(*5.522000*)	(*5.988587*)	(*5.104191*)

The literature on saving performance has used a variety of estimation techniques. Because the data are pooled, one common approach is to use a fixed-effects estimator which allows for different country intercepts. Given that we are not trying here to include all variables affecting saving behaviour, the country intercepts will capture the effects of these many omitted variables. However, this approach does not allow us to include a region dummy in order to test for any systematic differences between the LAC and OTHER countries in the pooled sample.

The random-effects estimator is an alternative that allows for such country-invariant variables. In addition, it is a more efficient estimator, since it does not include separate country and year dummies. However, it is an inconsistent estimator under conditions of correlation between the unobserved country-specific random effects and the regressors (Yaffee, 2003). Hausmann tests reveal that this is a problem for the LAC

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9. Tests were also run including dummy region and interaction variables for the group of East Asian countries in the sample (Singapore, South Korea, Malaysia, Indonesia, Thailand and Philippines), but these were not significant and lowered the fit of the regressions.

10. Because the panel is unbalanced, the variable means and standard deviations reported in Table 3 for the observations included in the regressions differ somewhat from those of the entire sample in Tables 1 and 2.

countries, but not for the pooled sample (ALL) or for the OTHER group. We therefore use the more efficient random estimator for ALL and OTHER but the fixed estimator for LAC. The results, however, are fairly robust to the different estimators.

Several recent studies have used a first-differenced instrumental variables system estimator such as the Arellano-Bond GMM estimator. For comparison purposes, we also use this approach. However, since first differencing eliminates time-invariant variables, we cannot include the dummies for the 1980s or the LAC region in this regression. On the other hand, the GMM approach allows us to measure what has been referred to as 'persistence' in saving behaviour (Loayza et al., 2000) by including lagged GDS as a variable. The specifications become:

$$(GDS_t - GDS_{t-1}) = \alpha + \beta_{1i}(\mathbf{X_{it}} - \mathbf{X_{it-1}}) + \beta_{2j}(\mathbf{Z_{jt}} - \mathbf{Z_{jt-1}}) + \beta_3 GDS_{t-1} + (e_t - e_{t-1}) \qquad (3)$$

and

$$(GDS_t - GDS_{t-1}) = \alpha + \beta_{1i}(\mathbf{X_{it}} - \mathbf{X_{it-1}}) + \beta_2 GDS_{t-1} + (e_t - e_{t-1}) \qquad (4)$$

where $\mathbf{X_i}$ are the same independent variables but no longer include the 1980s dummy, and $\mathbf{Z_j}$ are the interaction variables for each of the X independent variables and LAC but no longer include the LAC region dummy. Because of first-differencing, the number of countries in the GMM sample drops to 16 for the OTHER group.

In all cases, since a Breusch-Pagan test indicates the presence of heteroskedasticity, we use a heteroskedasticity-robust estimator to correct for unequal variance of the standard errors. The results are presented in Table 4. Coefficients significant at the 5% level or better are in bold, and coefficients significant at the 10% level or better are in italics.[11]

The key results for the panel tests are the following. First, for our pooled sample, per capita income is positive and significant at the 5% level, as we might expect. This is also the case in the separate test for the OTHER group. However, the LAC/income interaction term in the pooled test is also significant, and it is negative, with a larger coefficient. The separate LAC regression thus shows a significant negative relationship between per capita income and saving, consistent with the recent ECLAC findings discussed above. Similarly, income growth is significantly negative for LAC, while it is not significant for OTHER or in the pooled test. These findings are particularly striking, given the many studies that have found a positive correlation between GDP and saving.

Second, for the pooled sample, unemployment is significant and negative at the 10% level. The same is true for the OTHER group. However, unemployment is significant at the 5% level for LAC, and the coefficient is more than twice as large. This provides some insight into the weak saving performance in Latin America under the

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11. In all three GMM estimations, the Sargan test of overidentifying restrictions did not reject the null hypothesis that the instruments were uncorrelated with the error term. The serial correlation tests rejected the hypothesis that there was second-order serial correlation.

Table 4: Regression results (t/z statistic in parentheses)

Country Group	ALL		OTHER		LAC	
Estimator	random effects	AB-GMM	random effects	AB-GMM	fixed effects	AB-GMM
Lagged gross domestic saving		.6033 (11.43)		.6386 (6.36)		.5679 (9.52)
Per capita income	**5.1924** **(6.58)**	1.0330 (1.33)	**5.1562** **(6.46)**	*2.4790* *(1.67)*	**-2.3686** **(-3.73)**	**-2.6153** **(-3.51)**
Income growth	1.7260 (0.47)	.7794 (0.28)	1.7369 (0.48)	-.1888 (-0.08)	**-3.9847** **(-2.08)**	**-3.7811** **(-2.97)**
Inflation	.2036 (0.04)	-6.9375 (-1.61)	.6664 (0.12)	*-6.5584* *(-1.66)*	.2452 (0.60)	*-.7423* *(-1.93)*
Inflation change	-.0082 (-0.40)	*-.0189* *(-1.95)*	-.0079 (-0.40)	-.0151 (-1.38)	.1786 (1.46)	**.2538** **(2.01)**
Real deposit rate	-.0271 (-0.25)	-.0946 (-1.51)	-.0194 (-0.18)	-.0727 (-1.45)	-.0052 (-0.85)	-.0053 (-1.45)
Unemployment	*-.2329* *(-1.67)*	-.2223 (-1.44)	*-.2373* *(-1.70)*	-.1558 (-1.05)	**-.5481** **(-6.63)**	**-.2405** **(-3.12)**
1982-1990 dummy	.2328 (0.28)		.2171 (0.26)		.0858 (0.17)	
LAC region dummy	**49.9439** **(5.72)**					
LAC/income interaction	**-7.2635** **(-7.25)**	**-2.8348** **(-3.95)**				
LAC/income growth interaction	-5.6502 (-1.38)	-4.8459 (-1.64)				
LAC/inflation interaction	.1633 (0.03)	6.2246 (1.44)				
LAC/inflation chg interaction	.1800 (1.24)	**.2754** **(2.26)**				
LAC/RDR interaction	.0214 (0.20)	.0888 (1.41)				
LAC/unemployment interaction	*-.2985* *(-1.88)*	-.0167 (-0.10)				
LAC/1980s interaction	-.0620 (-0.06)					
Constant	*-11.8514* *(-1.71)*	.0427 (0.79)	-11.5880 (-1.62)	-.1086 (-0.96)	**41.1315** **(8.17)**	*.0981* *(1.70)*
No. of observations	517	459	206	171	311	288
Wald Chi2[d.f.]/ F [d.f.]	**210** [15]	**730** [13]	**107** [7]	**568** [7]	**13** [7,286]	**196** [7]
R^2						
within	0.2653		0.2815		0.2532	
between	0.2329		0.2550		0.1441	
overall	0.3651		0.4847		0.0031	

reforms: overall unemployment in the region rose steadily in the1990s (ECLAC, 2002), even in countries like Argentina that experienced solid growth. This suggests that the character of economic growth may be a key factor in saving performance, at least where household saving is concerned.

Consistent with the recent empirical studies summarised above, the deposit rate is insignificant in the pooled and regional panel regressions. The same is true of the inflation and inflation volatility coefficients. While the highly significant Wald chi-squared and F-statistic results in all cases indicate that the model is a good fit, the low R-squared values for LAC indicate that the variables emphasised as key to saving behaviour in the reform literature in fact explain only a small part of the overall variation in the region's saving behaviour. The explanatory power of the model for the OTHER countries is somewhat better.

The GMM tests confirm the significance of income and unemployment for LAC. In addition, with the GMM estimator we find a weakly significant (10% level) negative relationship between inflation and saving in each region, consistent with the findings of Masson et al. (1998) and Bandiera et al. (2000) discussed earlier, although the size of the LAC coefficient is many orders of magnitude smaller than it is for the OTHER countries. At the same time, inflation change has a negative relationship with saving in the pooled sample, consistent with the findings of Dayal-Gulati and Thimann (1997). However, the results for LAC are the opposite, showing a significantly positive relationship between inflation change and saving. Thus a higher level of inflation is associated with lower saving in LAC, but inflation volatility is associated with higher saving. Since both have fallen in the region in the 1990s, their effects on saving have been contradictory. It is worth noting that these inflation volatility results for LAC are the opposite of the Dayal-Gulati and Thimann findings for their 9 Latin American countries from 1975 to 1995, suggesting that these results are particularly sensitive to the time period and country sample.

Finally, the GMM estimator shows clearly the persistence of saving behaviour. In all three cases, lagged saving is a significant positive predictor of current saving, as Loayza et al. (2000) find in all their tests.

5 Conclusions

For many decades, those seeking solutions to the low levels of saving in Latin America focused on fiscal and liberalisation reforms. The expectation was that lower levels of inflation, resulting higher real deposit rates, and higher rates of income growth would stimulate higher rates of saving. Unfortunately, these expectations have not been met. While inflation has indeed fallen dramatically, real interest rates have risen, and income has grown in the region (albeit with greater volatility and at lower rates than expected), we have seen that saving rates have remained low, relative both to earlier levels and to other developing countries.

Part of the explanation lies in the insignificance of some of these factors for saving rates in the region. Our empirical analysis shows that real deposit rates are not related to saving in any of our specifications, for any country group. This is consistent with the majority of existing studies, especially for developing countries. In other respects, we find that the determinants of saving behaviour in Latin America are fundamentally different from those of other developing countries. While inflation was negatively related to saving in the GMM model for both the Latin American and other developing countries, inflation volatility was positively related to saving in the Latin American country sample while negative and insignificant for the other countries. Thus the impact

of controlling inflation in the region has been more complex than expected. These findings may also help explain the very mixed results with respect to inflation in existing empirical studies, since the results appear to be highly sensitive to country specification and inflation volatility.

Furthermore, although per capita income was positively related to saving in the comparison group of developing countries over the past several decades, it has been negatively related to saving in the Latin American countries during this period. The latter was also true of income growth. This suggests that higher income alone is not sufficient to promote a higher rate of saving in the region, and directs our attention to the character of the growth process.

We investigated one potentially relevant aspect of that growth process, the level of unemployment, and found that it is indeed significant. Higher rates of unemployment are negatively correlated with saving, at the 5% level in Latin America and at the 10% level in the other developing countries. The negative relationship between income/income growth and saving even when unemployment is held constant, however, indicates that there are other important aspects of the growth process that need to be considered. Some of the recent literature has emphasised the importance of financial institutions, while others have suggested that capital flight or economic inequality may also play a significant role. There is also evidence of a negative relationship between inflows of foreign savings, which have risen for Latin America since the 1980s, and the level of national saving (Schmidt-Hebbel and Serven, 1999; ECLAC, 2007).

In addition, differences between the two groups of countries in the levels of the independent variables explain some of the difference in saving rates. While average income per capita (by design) and average annual income growth rates are quite similar in the two groups of countries for the observations included in the regressions, we can see from Table 3 that there are considerable differences with respect to the other independent variables. The LAC countries have a higher average level of inflation (continuing in the 1990s, as Table 2 shows), which was found to be correlated with lower saving. They also have higher unemployment, with a similarly negative saving relationship. Surprisingly, they have higher average real deposit rates, but these were not significantly related to saving.

Another area to explore is the behaviour of public saving, which has been shown to offset private saving only partially. Indeed, this is the aspect of government saving that has been most assiduously analysed in the literature, while there is very little work on the determinants of government saving itself.[12] As we saw in Table 1, not only has private saving in LAC declined steadily from the mid-1970s to the mid-1990s, overall domestic saving has also stagnated from the 1980s to the mid-2000s. Although public saving has varied over the period and between countries of the region, it has generally been unsatisfactory. The largest country in the region, Brazil, has had very low public saving over the 1995-2003 period: -2.1% in 1995-8, 0.7% in 1999-2003 (Giambiagi and Ronci, 2006: 104). This is mainly due to sharp increases in primary expenditure, and has occurred despite the improvement in Brazil's fiscal balance over this same period as

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12. One study that did examine the determinants of government saving in the 1983-92 period found a negative effect of political instability, foreign savings and GDP per capita, and a positive effect of growth (Edwards, 1995).

fiscal revenues have risen. In general in the region, budget surpluses have been achieved through cuts in public investment rather than by containing current expenditures (de Mello, 2006: 14), which have kept pace with rising revenues.[13] More work on the determinants of public saving would be useful.

Another interesting area to explore is the breakdown between household and enterprise saving behaviour in Latin America. Data constraints make it difficult to separate out these two components of national saving, and only a few country studies have been carried out on this topic. A recent empirical study by ECLAC (2007) explores the relationship between enterprise profits and national saving for 6 Latin American countries over the 1994-2003 period, and finds a negative relationship that suggests a negative household wealth effect. Presumably, much of the enterprise profits have passed through to households and to the government as taxes, rather than being retained as enterprise saving. Given that the enterprise operating surplus is a sizeable proportion of national income, research on the determinants of enterprise saving would also be very useful.

It appears, then, that all three components of national saving – household, government and business – have remained weak in Latin America. At the end of the day, what accounts for the low level of saving in the region? The persistence of saving behaviour around the world has been noted by Loayza et al. (2000), a phenomenon they refer to as the *inertia* of saving rates. Our results find similarly high levels of persistence, for the developing countries overall, and for the two separate groups of countries. Thus low relative saving in Latin America today is in part a result of low relative saving in the past. The reasons for that are likely to be deeply rooted in social structures that the economic reforms, despite their dramatic impact on economic structures, have not affected in any significant manner. Lower and more stable inflation levels, moderate economic growth, and higher real interest rates have not changed the fundamental behaviours that underlie the region's low saving rates.

A comparison with the high-performing East Asian economies suggests some potential socio-institutional explanations. In the early decades of rapid economic growth in South Korea and Taiwan, the export orientation of their industries, coupled with growth-oriented government policy, constrained access to consumer goods, potentially contributing to a 'habit' of saving. In Latin America, growth under ISI, coupled with more populist government policies, led to an abundance of new consumer goods and may have contributed to a 'habit' of consumption. Following the economic collapse of the 1980s, rising income and access to cheaper imports in the 1990s may have led to a surge of consumption as households attempted to recover from the lost decade. This is, of course, only suggestive. Many pieces of the puzzle are still missing, and more research is needed to elucidate the deeper underlying causes of low saving in Latin America. What is evident, however, is that the focus of the neoliberal economic reform agenda of the 1980s was misplaced.

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13. Including windfall gains, especially in the 1990s, from privatisations. It should be noted, however, that in the past few years public revenues in the region overall have risen much more sharply than public expenditures, as commodity prices have boomed (ECLAC, 2007). Whether that will continue as oil prices rise and US economic growth slows remains to be seen.

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