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MACROECONOMIC POLICIES AND PERFORMANCE IN LATIN AMERICA

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Resumen

El presente artículo provee nueva evidencia sobre políticas macroeconómicas y resultados en América Latina. Entre los principales resultados tenemos: (i) la habilidad de realizar políticas contracíclicas depende del nivel de credibilidad, (ii) la precisión de la autoridad monetaria en cumplir las metas inflacionarias depende de la independencia del Banco Central y del riesgo país, (iii) los regímenes cambiarios intermedios son menos persistentes, (iv) los regímenes cambiarios afectan inflación y crecimiento, (v) la tendencia del tipo de cambio real (TCR) no es explicada por crecimiento de productividad y las reformas de oferta no pueden corregir los desalineamientos del TCR, (vi) existe un mayor nivel de integración financiera en los últimos años, (vii) los choques externos son un determinante importante del crecimiento, y (viii) la composición de los influjos de capital del exterior son relevantes para el crecimiento.

Abstract

This paper provides new evidence on macroeconomic policies and results in Latin America and the Caribbean. Results are: (i) credibility allows adoption of counter-cyclical macroeconomic policies; (ii) accuracy in meeting inflation targets depends on central bank independence and country risk; (iii) intermediate exchange rate (ER) regimes have become less persistent; (iv) ER regimes matter for inflation and growth; (v) real ER trends are not explained by productivity growth and supply reforms do not resolve real ER misalignments; (vi) financial integration has increased significantly; (vii) foreign shocks are a major growth determinant; and (viii) composition of foreign capital inflows matters for growth.

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1. Introduction

Latin America and the Caribbean (LAC) – a region of recurring crises – is currently in turmoil. Against the high hopes of the early 1990s, the crises observed in many countries and the lackluster performance in others are particularly disappointing. This paper assesses macroeconomic policies and performance in the region, providing new evidence based on recent cross-country data for the region and the world at large.

From a medium-term perspective, our paper evaluates macroeconomic policies in LAC over the past decade in two dimensions. First, we assess the determinants and stability of monetary and fiscal policies, emphasizing the role of credibility. Second, we evaluate the consequences of macroeconomic policies on economic performance. Here we evaluate the importance of growth policies on real exchange rates, the effects of policies on inflation and growth, and the extent of international financial integration in LAC. The paper focuses on several specific hypotheses arranged into four broad themes.

Section 2 deals with monetary and fiscal policies. There we test first if monetary and fiscal policies are pro- or counter-cyclical in emerging economies and what determines their cyclical stance. Then we focus on the world sample of inflation-targeting countries to assess the role of institutions and credibility in their accuracy in meeting inflation targets.

Section 3 evaluates exchange rate regimes and hypotheses for the world at large and for LAC. First we provide evidence that regime persistence has changed significantly in the recent past in LAC, supporting the two-corner hypothesis. Then we provide evidence that exchange-rate regimes do matter for inflation and growth, both in steady state and during regime transitions. Finally, we test for the Harrod-Balassa-Samuelson productivity-growth hypothesis for explaining real exchange rate (RER) trends and assess whether RER misalignments can be undone by supply reforms that raise growth.

Section 4, on foreign resource flows, evaluates whether international financial integration has increased in LAC and in the world at large. We first evaluate the degree of capital mobility by assessing whether saving-investment correlations and real interest rate differentials have declined over time. In addition, we test whether real interest rates have converged faster after 1990. We provide evidence that real interest rate differentials have declined significantly in LAC since 1990.

Section 5, on economic growth, tests two final claims: foreign shocks have been the major factor in economic performance and the composition of capital flows is relevant for long-term growth in LAC. We provide evidence that foreign shocks contribute more than 80 percent to explain growth, and that foreign direct investment (FDI) is the only major category of capital inflows that is relevant for long-term growth.

Section 6 concludes. Data sources and definitions are discussed in the Appendix.

2. On Fiscal and Monetary Policies

2.1 Weak institutions and credibility are key to understand the cyclical behavior of fiscal and monetary policies in emerging economies

The traditional view of fiscal and monetary policies in developing countries (and particularly in LAC) is that they are pro-cyclical, contributing to deepen business cycles (e.g., Hausmann and Stein, 1996; Gavin and Perotti, 1997; Gavin and Hausmann, 1998; Talvi and Végh, 2000). It has been argued that governments relax their policies during booms and restrict them during busts, due to weak institutions, unfavorable political-economy equilibria, and volatile access to international capital markets.

The latter hypothesis may be true for countries with weak institutions and policies. However, macroeconomic policy is likely to play a stabilizing role in those emerging economies that —like industrial nations— exhibit more mature institutions, stable policies, and sound

fundamentals. For example, Chile and Malaysia adopted expansionary policies in 2001-02, a period of cyclical weakness.

One way to characterize country heterogeneity regarding pro- or counter-cyclical policy stance is to control for their institutions and policy credibility. As we focus on emerging countries, we use country risk premium spreads on their sovereign debt as a summary proxy for institutional and credibility weakness. We expect higher country-risk spreads to signal a policy bias toward a more pro-cyclical policy position.

We specify the following equations for the behavior of monetary and fiscal policy (the deviations of the real interest rate and the fiscal balance from their means), determined by the domestic output cycle and the interaction between the cycle and the level of the country-risk spread:[1]

$$(r - \bar{r})_{it} = \alpha_0 + \alpha_1 (y - \bar{y})_{it} + \alpha_2 (y - \bar{y})_{it} \rho_{it} + u_{it} \quad (1)$$

$$(f - \bar{f})_{it} = \beta_0 + \beta_1 (y - \bar{y})_{it} + \beta_2 (y - \bar{y})_{it} \rho_{i,t} + v_{it} \quad (2)$$

where $(r - \bar{r})$ is the deviation of the real interest rate from the country sample mean, $(f - \bar{f})$ is the deviation of the fiscal balance as a percentage of GDP from the country sample mean, $(y - \bar{y})$ is the GDP deviation from the HP-filtered country GDP trend,[2] ρ is the country-risk spread, u and v are stochastic residuals, and i and t are country and time indexes.

The pro-cyclical (counter-cyclical) stance of macro policies is reflected by a negative (positive) coefficient of the business cycle variable. A negative coefficient of the interaction term between the business cycle and the country risk premium would reflect how weak institutions and

[1] Equation (1) is similar to a Taylor rule for monetary policy. However, it excludes the deviation of inflation from its target (or any right-hand side determinant of monetary policy other than the output deviation from its trend) for maintaining symmetry with the fiscal rule in equation (2) and to focus on the interaction term with the country-risk spreads.

[2] The results are robust to using the alternative Baxter-King filter to obtain trend GDP levels for each country.

low credibility – reflected by high country spreads – bias policies toward a more pro-cyclical position.[3]

We estimate equations (1) and (2) for a panel comprised by 11 emerging economies (including LAC's eight largest economies) and annual 1996-2002 data. We report GLS fixed-effects panel results in Table 1 for the full country sample (columns 1 and 3) and for a smaller sample that excludes Argentina and Ecuador (columns 2 and 4).[4]

The results show significant and robust effects of the business cycle and its interaction with country spreads across country samples and macroeconomic policy variables. All coefficients exhibit expected signs and are significant at the 1% level. Both monetary and fiscal policies are significantly counter-cyclical in emerging economies when country spreads are low or moderate. However, higher country spreads bias both policies significantly toward a more pro-cyclical position. It is straightforward to calculate the country spread level at which policies change sign and turn pro-cyclical. Using the full-sample results, monetary policy turns pro-cyclical at a spread of 2811 basis points (bp) and fiscal policy turns pro-cyclical at a spread of 4797 bp. Excluding high-spread Argentina and Ecuador from the sample, we estimate that monetary and fiscal policy turn pro-cyclical at the much lower spreads of 822 bp and 574 bp, respectively.

This new evidence contradicts the traditional view that macroeconomic policy is pro-cyclical in emerging economies. Our results support the notion that countries with low to moderate risk spreads – reflecting better fundamentals and larger credibility – are capable of pursuing counter-cyclical policies. Only countries with high spreads exhibit pro-cyclical policies.

[3] We added a separate institutional and political variable interaction term with the business cycle in our preliminary empirical work. We used individual variables such as government effectiveness, regulatory quality, rule of law, and control of corruption as well as their average from Kaufman et al. (2002). Results (available on request) showed that the latter added interaction term was neither significant nor robust across policies and country sub-samples.

[4] Argentina and Ecuador were sample outliers in the sense of featuring very high country risk premiums and lacking the ability to pursue independent monetary policy during much of the sample period (Argentina until 2001 and Ecuador since 2000). The full sample of 77 observations represents the largest sample of emerging countries with complete data available for the most recent period.

2.2 Central bank accuracy in meeting inflation targets increases with central bank independence and declines with country risk spreads

Inflation targeting (IT) is a new monetary regime that began with New Zealand's pioneering experience in 1990. During the subsequent 13 years, 19 countries have also adopted this regime, among them five Latin Americans: Chile in 1991, Peru in 1994, and Colombia, Brazil, and Mexico in 1999 (Schmidt-Hebbel and Tapia, 2002). The continuing addition of IT countries is reflected by an exponential increase in the number of country-year observations since 1990. For a 1990-2001 panel study we use 103 country-year observations for the world population comprised by 20 IT countries. Our data shows that IT countries have been able to reduce both inflation rates and inflation target misses systematically since adopting the new monetary regime. On average, inflation rates have declined from 8% in the first year of IT adoption to 3% in the 8th year after adoption. At the same time, inflation misses – measured by absolute deviation of actual inflation from target points or ranges – have also declined over time, although less clearly than have inflation levels (Calderón and Schmidt-Hebbel, 2003). There is evidence that IT has been successful in raising monetary policy credibility, reducing output volatility, and stabilizing inflation expectations (Corbo et al., 2002; Mishkin and Schmidt-Hebbel, 2002; Schmidt-Hebbel and Werner, 2002). However, it is not clear what determines the success (or failure) of IT central banks in hitting their targets.[5]

In fact, IT countries have been subject to strenuous tests coming from both domestic and foreign shocks, particularly after the 1997-98 Asian crisis and its repercussions on most emerging countries. Regarding external shocks, large increases in the volatility of oil prices and U.S. GDP and sudden stops of foreign capital inflows have been observed since 1997, contributing to large exchange-rate depreciation in many inflation-targeting countries, straining their ability to meet

inflation targets. Additional domestic shocks have hit hard several inflation targeting countries, ranging from civil strife in Colombia to political uncertainty in Brazil and Peru. Hence is luck more important than fundamentals in explaining differences in inflation performance among IT countries?

We respond to this question by specifying and estimating the following equation for the deviation of inflation outcomes from inflation targets, which depends on international conditions (to account for good- or bad-luck shocks from abroad) and domestic fundamentals that help in building up monetary policy capability and credibility in meeting inflation targets:

$$\pi_{it}^{dev} = \alpha_i + \beta_1 \pi_{it-1} + \beta_2 S_{it-1}^{dev} + \beta_3 yus_t^{dev} + \beta_4 oil_t^{dev} + \beta_5 cbi_{it} + \beta_6 embi_{it} + \varepsilon_{it} \qquad (3)$$

where π_{it}^{dev} is the deviation of actual inflation from the inflation target, π is the inflation rate, S_t^{dev} is the nominal exchange-rate forecast error, yus_t^{dev} is the US GDP deviation from trend, oil_t^{dev} is the nominal oil price forecast error, *cbi* is a dummy for central bank formal independence, and *embi* is the country-risk spread.

External shocks – to control for the extent of luck from abroad – are represented by US GDP shocks and oil price shocks (common to all countries). The latter, as well as country-specific exchange-rate shocks (which are also partly determined by foreign shocks) make it more difficult to meet targets. Lagged inflation is included because it is easier to hit target inflation when inflation is low. Finally we include two variables that are representative of country-specific fundamentals. One is a measure of central bank formal independence, which contributes to monetary policy strength and credibility, and hence should raise inflation- targeting accuracy (Bernanke et al., 1999). The other is the sovereign risk premium, an overall measure of external solvency and perceived institutional and policy risk; higher country spreads signal a lower capability to attain inflation targets.

[5] Corbo, Landerretche, and Schmidt-Hebbel (2002) evaluate the performance of inflation-targeting countries in comparison to a control group of low-inflation industrial countries.

We estimate equation (3) for our unbalanced panel sample comprised by a maximum of 19 countries and a maximum of 12 years spanning the 1990-2001 history of IT. We use two alternatives for the dependent variable and for three independent variables (the two unanticipated shocks and the US GDP deviation from trend): absolute and squared deviations.

The results in Table 2 provide a robust backing to the hypotheses embedded in equation (3). All coefficients exhibit expected signs and most are significant at the 1% level. External shocks, exchange-rate shocks, and inflation raise the (absolute and square) deviation between actual inflation and target levels. Regarding fundamentals, central bank formal independence raises target accuracy. Weak fundamentals, reflected by high country risk spreads, reduce target accuracy. Hence we conclude that, controlling for external bad luck (which has been sizable in recent years), strong institutional and policy fundamentals contribute significantly to hitting inflation targets closely.

3. On Exchange-Rate Regimes and Levels

3.1 Countries have switched away from intermediate exchange rate regimes to corner solutions. Hence, intermediate regimes are less persistent than any other regime

The recent currency crises in Asia, Russia, and LAC, together with the successful adoption of the euro, have renewed the debate on optimal exchange rate regimes. Until recently, many academics and policy makers favored intermediate regimes (e.g. adjustable pegs and exchange rate bands) as an optimal choice in the face of the presumably dominant tradeoff between credibility (associated to hard pegs) and flexibility (associated to floating regimes). However, the recent crises have illustrated the large costs of defending these regimes in countries with high capital mobility. It is now often argued that in a world of high capital mobility only hard pegs or floats are feasible (Eichengreen, 1994; Fischer, 2001). This *bipolar view* (or two-corner solution) of regime choice

predicts that countries will increasingly switch to either more flexible regimes or extreme forms of pegs (specifically renouncing national currencies).[6]

A worldwide trend away from intermediate regimes (i.e. adjustable exchange rate pegs and bands) and towards the two corners has been observed during the past decade. The number of countries with hard pegs rose from 27 in 1991 to 48 in 2001 while those with floating regimes increased from 17 in 1991 to 31 in 2001.[7] On the other hand, we observe two opposite trends taking place in LAC within the 1990-2002 period. In 1990, eight out of 28 LAC countries had hard pegs in place (seven countries with a currency board and Panama fully dollarized) and only two countries (Suriname and Venezuela) had a floating system. Six countries had intermediate regimes and 12 had soft pegs. Subsequently and until the outburst of the Asian crisis were the heydays of intermediate regimes. Eleven LAC countries shifted from soft pegs to intermediate regimes between 1990 and 1997, while the number of countries with hard pegs or floats remained invariant. The opposite trend is observed since the worldwide currency crises of 1997-98, as LAC started to shift massively away from intermediate exchange rate regimes and mostly towards floating regimes. The number of countries with intermediate regimes declined from 17 in 1997 to five in 2002 while the countries with floats rose from two in 1997 to 13 in 2002. The number of hard pegs rose slightly to nine in 2002, of which the fully dollarized economies increased from one to three (Panama was joined by Ecuador and El Salvador).

Until recently it was often claimed that intermediate exchange rate regimes were the most persistent. Now we test for this hypothesis against the alternative bipolar view that states that intermediate regimes are hollowed out. Using 1974-2002 data on *de jure* exchange rate regimes for

[6] In contrast to the bipolar view, Frankel (1999) argues that there have been exits from monetary unions, currency boards, and floats.

[7] For these calculations, we use the data on *de jure* exchange rate regimes gathered by Reinhart and Rogoff (2002). Following Ghosh et al. (1997), we classify regimes without a separate legal tender and currency boards as hard pegs. Cooperative systems and floats within a pre-determined range are classified as intermediate regimes, whereas floats without a pre-determined range and clean are considered floating regimes.

LAC, we measure the probabilities of regime transitions. Following Masson (2000), we model the choice of exchange rate regimes by a Markov chain, according to which the probability that a country has in place any one of three broad regimes (hard pegs, intermediate regimes, or floats) depends only on the regime it had in place in the preceding period. We denote by p_{ij} the probability of having in place regime j in period t, conditional on having in place regime i in period t-1 (i=1 for hard pegs, i=2 for intermediates, and i=3 for floats). A hard peg is an absorbing state in the 3x3 transition matrix if $p_{11}=1$ and all other elements in the first row are equal to zero. The bipolar view holds if $p_{11}+p_{13}=p_{31}+p_{33}=1$, and $p_{12}=p_{32}=0$; that is, if countries are abandoning intermediate regimes. Transitions between floats and hard pegs could occur but not back to intermediate regimes or soft pegs.

Using annual observations on exchange rate regimes for 28 LAC countries over the 1974-2002 period (post-Bretton Woods), we estimate the transition matrix of changes in monetary arrangements. From a total of 812 observations, 326 correspond to fixed regimes (305 hard pegs and 21 soft pegs), 250 to intermediate regimes, and 236 to floating regimes. According to the 1974-2002 matrix and the matrix for our period of interest, 1990-2002, we observe that all regimes can be reached from each state (see Table 3). Since both matrices are qualitatively similar, we focus on the 1990-2002 results.

A hard peg is the most persistent process with a 97% probability of remaining the following year. Intermediate regimes appear to be more persistent than floats (90% and 81%, respectively). We also find that in 15% of the cases, LAC countries may switch from floats to intermediate regimes, whereas the probability of switching from hard pegs to intermediate regimes barely reaches 1%. However, adopting an exchange rate regime is not a once-and-for-all decision. The data reveals that major currency crises have triggered a reverse transition towards the corners in the late 1990s. Therefore, it seems relevant to compute separate transition matrices for the 1990-97 and 1998-2002 periods.

In fact, intermediate regimes show a degree of persistence as large as that of hard pegs (0.94 vs. 0.97, respectively) during 1990-97, and countries moved from floats to intermediates in 20% of the cases. However, we observe the opposite pattern in LAC during 1998-2002: (i) intermediate regimes became less persistent (0.83), (ii) floats became as persistent as hard pegs (0.96 vs. 0.98), and (iii) the data supports the bipolar view. The probability of switching from any of the extremes to the middle is equal to zero, so that the hypothesis of intermediate exchange rate regime persistence has been hollowed out in LAC in recent years.

Finally, to check for longer-term survivorship, we examine transition matrices of regime changes for periods beyond one year.[8] For five-year periods and the full 1990-2002 period, we still find that hard pegs are the most persistent (0.88) but now intermediate regimes are less persistent than floats (0.53 vs. 0.63, see Table 3). The structural break observed after 1997, consistent with the two-corner hypothesis is also confirmed.[9]

3.2 Exchange rate regimes are important for inflation and growth

Is the choice of an exchange regime neutral for macroeconomic behavior? Are inflation and growth affected by the choice of a particular exchange rate system or by the transition from one system to another? In this section we discuss the traditional issue about regime neutrality in steady state and the newer issue about the inflation and growth effects of regime transitions, which is closely linked to the regime survivorship question tackled in section 3.1. With so frequent regime changes away from intermediate regimes and toward the two corners in 1998-2002 in LAC, it is important to assess the inflation and growth consequences of these changes. Historically inflation-prone countries have switched to floating rates whenever domestic policies were inconsistent with pegged exchange rates. Floating per se was not the reason for inflation; weak domestic policies

[8] We perform the analysis for changes in 3-5 years. We only report the changes for 5 years although the other matrices (3 and 4 years) give qualitatively similar results.

were. This may be different today as countries with stronger policies and lower inflation are adopting more flexible exchange-rate regimes.

The choice between alternative regimes focused traditionally on the tradeoff between credibility and the power of an independent monetary policy to insulate the economy from shocks. More recently, in the context of increasing capital flows and large external shocks, the exchange rate debate is focusing on the tradeoff between inflation and growth. It is argued that fixed regimes reduce inflation and its volatility by enhancing credibility of stabilization policies and imposing discipline. It is also argued that flexible regimes enhance growth and reduce output volatility by allowing relative-price adjustments in response to external shocks.

We test whether the exchange rate regime matters for inflation, defined as $\pi/(1+\pi)$, and growth, in the spirit of recent work by Ghosh et al. (1997) and Levy-Yeyati and Sturzenegger (2001, 2003). We use data on both *de jure* exchange rate regimes (Reinhart and Rogoff, 2002) and *de facto* regimes (as developed by Levy-Yeyati and Sturzenegger 2001, 2003). Inconsistencies between exchange rate regimes announced by governments and their actual practices make this distinction empirically very relevant (Levy-Yeyati and Sturzenegger, 2002).

We estimate the impact of exchange rate regimes on inflation and growth for a world sample of 142 countries and a LAC sample of 28 countries during the post-Bretton Woods era (1974-2001).[10] Among fixed regimes, we also distinguish between sub-categories of countries with long pegs and hard pegs.[11] Finally, since inflation and growth may influence the government's

[9] Although the result is robust when changes in 3 and 4 years are analyzed, we should interpret our results cautiously because of the relatively small number of observations.
[10] We also assess the impact of exchange-rate regimes on inflation and output volatility. Results are not reported for the sake of space; they are discussed in Calderón and Schmidt-Hebbel (2003).
[11] We follow the definition of long pegs proposed by Levy-Yeyati et al. (2002): "long pegs are those in place for five or more consecutive years" (p. 64).

choice of exchange rate regimes, we fit a multinomial logit for fixed and intermediate regimes and perform instrumental-variable (IV) regressions with the adjusted probabilities.[12]

Table 4 reports the impact of exchange rate regimes on inflation. Specifically, we run a regression of the inflation rate on its lagged value, output growth, money growth, openness, and dummies for fixed and intermediate regimes.[13] Our results yield negative and significant coefficients for fixed and intermediate regimes regardless of the regime data or estimation techniques. *De facto* fixed regimes in LAC are associated with inflation rates that are 4.25% lower than under floating regimes. Inflation rates are even lower (relative to floating regimes) under long pegs (about 3.7%), thus supporting the role of pegs as credibility- and discipline-enhancing stabilization devices.[14] Interestingly, in contrast to the world sample results, we cannot obtain an additional significant effect for hard pegs in LAC.

In Table 5 we report the impact of exchange rate regimes on economic growth. Among the determinants of growth we include its lagged value, the ratio of investment to GDP, the degree of openness, the ratio of government consumption to GDP, terms of trade shocks, and our dummies for fixed and intermediate exchange rate regimes. We find that growth in countries with pegs is 1.7% lower than in those with floats in LAC, and that in countries with intermediate regimes it is even lower (2.1% lower than floats). In addition, having a long peg or a hard peg imposes an additional cost on growth relative to shorter or softer pegs.

[12] For our IV regressions, we first estimated a multinomial logit for fixed and intermediate regimes and the fitted probabilities were used in the regressions reported in tables 4 and 5. Our set of determinants (relative size of the country, geographical area, the reserves to imports ratio, the ratio of quasi-money to money ratio, the degree of openness, and dummies for landlocked countries and islands) was taken from the literature (Poirson, 2001; Juhn and Mauro, 2002; Levy-Yeyati, Sturzenegger and Reggio, 2002). Our OLS regressions are available upon request.

[13] We include regional dummies for LAC, Sub-Saharan Africa and the transition economies in our full sample regressions. Although we do not report the coefficients for the regional dummies in our regressions in tables 4 and 5, they are available on request.

[14] For the analysis of the distinction between long pegs vs. short pegs, and hard pegs vs. soft pegs, we only report our coefficients of interest due to lack of space. Complete regression results are available on request.

Now we analyze whether regime transitions matter for the dynamics of inflation and growth in the world at large and in LAC. To characterize their dynamics, we follow Demirgüç-Kunt et al. (2000) by identifying switches from hard pegs to intermediate regimes, and switches from intermediate to floating regimes.[15] In the world sample we identify 46 cases of countries abandoning hard pegs, of which 24 represent switches from hard pegs to intermediate regimes. We also identify 82 cases of countries abandoning intermediate regimes, with 28 of switches from intermediate to floating regimes.[16] Then we pool the episodes of regime transitions defined by the year of the switch with three years before and after it. We are interested in the behavior of inflation and growth after the regime switch. Hence we run our variable of interest on dummy variables for the year of the switch (D_T) and dummies for the following years (D_{T+1}, D_{T+2}, D_{T+3}) and test for their significance.

Switches from hard pegs to intermediate regimes (Table 6, Panel I). We can not find a significant contemporaneous impact on inflation. However, inflation rises significantly, by 7%-9%, in the years 2 and 3 after the switch to intermediate regimes, relative to the period before abandoning the hard peg. On the other hand, growth declines by 2.7% in the year of the switch. For subsequent years we do not find further statistically significant effects.

Switches from intermediate to floating regimes (Table 6, Panel II). There is no significant effect of the switch on contemporaneous inflation, but inflation falls by 1.7% in the following year. Growth increases by 2% in the second year after the switch from intermediate regimes to floats.

Therefore the choice of exchange rate regime – and regime transitions – does matter for inflation and growth performance in the world and in LAC. Controlling for regime choice endogeneity, we show that inflation is significantly lower under fixed regimes than under intermediate regimes and floats. In contrast, growth is significantly smaller under fixed or

[15] We limit the discussion of regime transitions to switches from pegs to intermediates and from intermediates to floats because they tend to be the more frequent transitions in LAC.
[16] See list of country episodes in the footnote of Table 7.

intermediate regimes than under floats. Moreover, we find that inflation is higher and growth is lower in the transition from hard pegs to intermediates, whereas the opposite result is observed when switching from intermediate regimes to floats.

3.3 Productivity growth differences do not track well real exchange rate trends and exchange rate misalignments cannot be corrected by growth-promoting reforms

Most LAC countries exhibit deterministic or stochastic trends in their real exchange rates (Calderón and Schmidt-Hebbel, 2003). These trends could be attributed to differences in productivity growth with the rest of the world, as suggested by the Harrod-Balassa-Samuelson (HBS) hypothesis. According to the literature, the relationship between productivity shocks and RER changes is empirically valid over relatively long horizons (Chinn, 1997; Canzoneri et al., 1999). Here we assess whether productivity shifts in LAC countries accounted for movements in multilateral RERs during the 1990s. We will compare the evolution of RERs with productivity shifts during the 1990s and five-year sub-periods.

Using a standard two-country two-sector model with a traded and a non-traded good and a single input (labor), it is straightforward to derive the contribution of productivity shifts to changes in RERs.[17] According to the model, the contribution of international differences in relative sector productivity growth rates to RER changes is:

$$\hat{q}(HBS) = -\alpha(\hat{A}_T - \hat{A}_N) + \alpha^*(\hat{A}_T^* - \hat{A}_N^*) \qquad (4)$$

where $\hat{q}(HBS)$ is the HBS-based percentage RER appreciation, $\hat{A}_i$ ($i=N,T$) is the growth rate of labor productivity in sector i (N and T represent traded and non-traded sectors), and α is the weight of the non-traded sector in total output. A star denotes a foreign variable.

[17] More detail on HBS model specification, based on Obstfeld and Rogoff (1996) and Tille et al. (2001), is provided in Calderón and Schmidt-Hebbel (2003).

We report the HBS-predicted and actual changes in multilateral RER for 18 LAC countries in the 1990s in Table 7. We find that relative productivity growth differences are unable to explain RER changes in LAC countries over the 1990s, regardless of the horizon analyzed (five or ten years). For 1991-2000, we find that productivity shifts explain the direction of the RER in eight out of 18 LAC countries. Relative sector productivity growth differences predicted correctly a real depreciation throughout the decade in Chile, Costa Rica, Honduras, Peru, Paraguay, El Salvador, Trinidad and Tobago, and Venezuela, but the magnitude was severely underestimated in six of the eight latter countries. For the five-year sub-periods that span the 1990s, we find that in 13 out of 18 LAC countries, RER changes predicted by productivity growth are in the same direction as the actual changes.

The median contribution of productivity to RER changes in LAC is approximately 60% over the 1996-2000 period, which is larger than the 30% contribution found by Tille et al. (2001) for industrial countries. However, the heterogeneity of the results regarding contribution sign and magnitude across different countries indicates that productivity differences do not track well RERs in the medium term. Edwards and Savastano (2000) also find that evidence in favor of the HBS hypothesis is inconclusive for emerging economies. This result is not discouraging. Recent evidence finds that: (i) more general models of RER determination (static or dynamic, partial or general equilibrium) that include other determinants such as net foreign assets or government spending outperform the HBS model (Edwards, 1989; Cavallo and Ghironi, 2002; Calderón, 2002),[18] and (b) there is significant evidence in support of the HBS hypothesis when we allow for non-linearities and volatility shifts across nominal exchange rate regimes, although the effect is economically negligible (Lothian and Taylor, 2003)[19].

[18] Calderón and Massad (2003) find that the evolution of the net foreign asset position, instead of productivity changes, is the main factor behind the large appreciation of the Chilean peso during its high-growth period (1986-1997).

[19] Lothian and Taylor (2003) find that productivity changes have significant but small effects on the dollar-sterling and dollar-franc real exchange rates over 200 years.

Even if productivity growth does not explain well overall RER trends, it might be the case that higher growth could contribute to correct exchange-rate misalignment in a time horizon short enough to avoid a speculative attack on a fixed exchange-rate regime. For instance, it was argued that a reduction of Argentinean production costs after 1995, as a result of growth-enhancing structural reforms, would help to undo a possible over-appreciation of the Argentine peso under the currency-board regime.

This claim can be evaluated by taking at face value our preceding HBS model for the contribution of productivity growth to RER trends. Using our world sample's average total and sector productivity changes for low- and high-growth countries (25^{th} and 75^{th} percentile, respectively), we parameterize the trend RER appreciation predicted by HBS in equation (4) (Table 8). The results show that very successful reforms that lead to large productivity increases, reflected in raising labor productivity from –1.6% to 2.2% per annum, would explain a change in exchange-rate trends from a depreciation of 0.9% per year to an appreciation of 0.8% per year. Could this help in correcting a significantly overvalued RER within a reasonable time horizon?

We combine the error-correction model for the RER that reflects the speed at which exchange-rate disequilibria are undone (following Taylor 2002), with the HBS hypothesis where the equilibrium RER is determined by traded and non-traded productivity to obtain:

$$dq_{it} \equiv q_{it} - q(HBS)_{it} = \varphi q(HBS)_{i,t-1} + \sum_{k=1}^{s} \delta_i dq_{i,t-1} + \xi_{it} \qquad (5)$$

where q_{it} is the real exchange rate of country i in period t (in logs), d is the difference operator, and $q(HBS)_{it}$ is the equilibrium RER level predicted by HBS. In addition, φ represents the percentage of the deviation from the equilibrium corrected after one period. Equation (5) specifies the adjustment dynamics of the RER to PPP levels adjusted by productivity growth.

We consider an initial real exchange rate disequilibrium of 25% at year *s*, a figure that is representative for unsustainable over-appreciation episodes,[20] reflected by $q_s - q_s(HBS) = 0.25\ q_s(HBS)$. Using a median half-life of three years of RER disequilibria, consistent with our estimates in Calderón and Schmidt-Hebbel (2003), we compute how much of the initial over-appreciation is closed at year *s*+3. Under the low-growth scenario, 15.2% of the initial over-appreciation still persists 3 years after. Under the high-growth scenario, 10.1% of the initial over-appreciation still persists at year *s*+3.

We conclude that the contribution of very successful structural reforms – reflected in a massive growth jump – to the reduction of RER over-appreciation is small. Even three years after the growth increase, it would help by reducing the RER misalignment only by 5 percentage points, while 10 percentage points of the initial misalignment remain to be corrected. The growth-induced RER correction is too little and too late to avoid a speculative attack on an inflexible exchange rate. Hence successful supply policies – even if they were possible under conditions of large relative-price distortions, like RER misalignment – are not a substitute for sustainable macroeconomic and exchange rate policies.

4. On foreign resource flows: International financial integration increased in LAC during the 1990s

It is frequently claimed that developing countries (and particularly LAC) face large foreign resource constraints that persist over the long term (although they are subject to large short-term volatility) and are largely exogenous. We test for international capital mobility in LAC by assessing: (i) the evolution of saving-investment (SI) correlations, and (ii) analyzing the convergence of domestic real interest rates to international rates.

[20] This figure is representative for international over-appreciation episodes, as studied by Goldfajn and Valdés (1999).

First, we compute Feldstein-Horioka (1980) regression-based SI correlations for a world sample of 144 countries. We regress the investment to output ratio on the saving ratio using annual data for 1960-2001.[21] The high degree of capital mobility that has characterized the global economy since the 1990s may be reflected in declining SI correlations over time.

We compute 20-year rolling SI panel correlations for groups of industrial, developing and LAC countries (see Figure 1).[22] We observe that SI correlations in industrial countries have declined at a very fast pace in the 1990s, thus reaching zero in recent years. The SI correlation in developing countries has increased from approximately 0.30 to 0.65. On the other hand, we observe a downward trend in SI correlations in LAC. It decreased significantly from a peak of 0.59 in 1966-85 to a trough of 0.38 in 1981-2000.

Second, we evaluate the extent of international financial integration by analyzing the behavior differentials between domestic and international real interest rates. In Figure 2, we depict 20-year rolling medians of absolute values of these differentials. We observe a clear downward trend in real interest rate differentials since 1990. Next we test for convergence in real interest rates following Lothian (2002) and Goldberg et al. (2002) and we test for a structural break in 1990. We model the real interest rate differential as an AR process:

$$\left(r - r^*\right)_t \equiv \alpha_0 + \alpha_1 D90 + \beta_0 \left(r - r^*\right)_{t-1} + \beta_1 D90 \left(r - r^*\right)_{t-1} + \varepsilon_t \qquad (6)$$

where $r\text{-}r^*$ is the differential between domestic and international real interest rates, D90 is a dummy variable that takes the value of 1 for the 1990-2002 period and 0 otherwise.[23] This dummy variable affects not only the intercept but also the slope coefficient. Our results for a selected sample of countries are reported in Table 9. The median value of the AR coefficient in LAC countries has decreased from 0.79 to 0.09 for our short-term interest rates. Hence, the half-life of adjustment in

[21] We consider SI correlation estimates only for countries with at least 10 observations, yielding 109 estimates for β. The median estimate is 0.58 for the full sample, with a minimum of –0.71 (Barbados) and a maximum of 1.70 (Russia).

[22] The sample of developing countries includes LAC.

interest rates decreased from 2.9 years to approximately one quarter since 1990. Also, the long-run real interest rate differential has decreased from a median of 13 to 3 basis points since 1990. The largest decline in the interest rate differentials has been observed in Argentina, Brazil, and Peru. In summary, we conclude that LAC has become more integrated with world capital markets. Declining SI correlations and real-interest-differentials support this hypothesis.

5. On Growth in Emerging Countries

5.1 Foreign shocks are the dominant cause of low growth in the 1990s

Adverse foreign shocks are often identified as the main culprit of weak growth performance in emerging economies. Here we evaluate the role of external factors in the growth performance of developing countries in general and LAC in particular, controlling for other growth determinants. According to the empirical growth literature, we estimate a growth regression equation with the following specification:

$$y_{it} - y_{it-1} = \alpha y_{it-1} + \beta' X_{it} + \mu_t + \eta_i + \varepsilon_{it} \qquad (7)$$

where y is log of output per capita, X is a set of growth determinants, ε is the regression residual, μ_t and η_i are the unobserved period- and country-specific effects, respectively.[24]

Our dependent variable is the growth rate of output per capita per period. The right hand side of the equation includes the level of lagged output per capita (in logs), and a set of contemporaneous explanatory variables. Our set of determinants of long-run growth follows the work of Loayza et al. (2003). We control for the initial level of GDP (in logs) to test for transitional convergence. As proxies for structural policies and institutions we consider indicators of human capital, financial depth, trade openness, government burden, and governance. We also include the

[23] We tested for different time breaks and the results are qualitatively invariant.
[24] Our growth regression framework is embedded in the tradition of empirical cross-country and panel growth models, specifications, and results. These models focus on the ultimate policy, structural, and external

inflation rate and real exchange rate overvaluation as proxies for stabilization policies. Finally, we include terms of trade shocks, international real interest rates, and private capital flows as external factors affecting long-term growth in emerging market economies.[25]

Recent evidence shows that capital flows stimulate growth, although there may exist important non-linearities in this relationship (Borensztein et al., 1998; Edwards, 2000). However, growth may have strong feedback effects on capital inflows. This may render biased estimates if possible endogenous regressors are not taken into account.

We estimate our growth equation (7) for a sample of 56 developing countries with non-overlapping five-year period average observations over the 1970-2000 period. We will use the GMM-IV system estimator for panel data proposed by Arellano and Bover (1995) and Blundell and Bond (1998) that accounts for (unobserved) country-specific effects and endogenous regressors. We should note that our specification tests confirm that our growth regressions are valid for statistical inference. Our instruments are valid according to the Sargan test and we reject the possibility of our errors displaying higher serial correlation.[26] We obtain consistent results for the control variables throughout our regression analysis. Therefore, growth is enhanced by more education, better governance, deeper financial systems, lower inflation, lower real exchange rate misalignment, and smaller government burden. The only puzzling result for our set of basic controls is the negative coefficient of openness (see Table 10).[27] Regarding the impact of external factors on long-term growth in emerging market countries, we find that:

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determinants of factor accumulation and productivity growth and therefore exclude capital and any other direct factor of production.

[25] For a detailed exposition on the inclusion of these variables and its theoretical effects on growth, see Loayza et al. (2003).

[26] By construction, our error terms should always exhibit first order linear correlation (Arellano and Bover, 1995).

[27] Since we focus on the role of external factors, we do not present a detailed analysis of these effects. A more detailed discussion of the economic impact of these variables on long-term growth is presented in Calderón and Schmidt-Hebbel (2003).

First, growth is enhanced by positive terms of trade shocks in emerging countries. An increase of one standard deviation in the terms of trade (0.046) causes growth to rise by 0.31 percentage points per year. Therefore, the decline in the terms of trade observed in the late 1980s and early 1990s had a severe detrimental effect on growth in emerging countries.

Second, surges in the real international interest rate are associated to lower growth in emerging markets. Higher rates in developed countries may encourage international investors to reallocate their funds away from emerging markets. If the international rate rises by one standard deviation (0.005), growth declines by 0.38 percentage points per year.

Third, growth is fostered by larger private capital inflows. If the ratio of private capital flows to GDP increases by one standard deviation (0.029), growth rises by 0.48 percentage points per year.

Next we use our estimated regression to assess the contribution of external factors to growth in Latin America. We report the predictions for the change in growth rates between consecutive five-year periods spanning the 1981-2000 period in Table 11. The relative contribution of external factors to growth is stable, around 80%, although its absolute magnitude changes over the last decade.

Growth in LAC increased by 1.5% in the 1991-1995 period relative to 1986-90. The contribution of external factors (1.14%) to explain growth (1.37) is approximately 80 percent. In the 1996-2000 period, growth declined by 1.4% in LAC. External factors contributed with a decrease of 0.42% to an explained decline of 0.44% (a contribution of more than 90 percent to explained growth). Hence, the role of external conditions is always dominant and relatively stable over time.[28]

[28] A sensitivity analysis for the variables that approximate external shocks is carried out. We find that our estimates are robust to the inclusion of additional explanatory variables such as infrastructure, systemic banking crises, political instability, religion, life expectancy, fertility, defense expenditures, democracy, and others. Results are available upon request.

5.2 The composition of foreign capital does matter for growth

In section 5.1 we found that private capital inflows enhance long-term growth. However, the literature suggests that the composition of capital flows also matters since its impact may vary across different categories of capital flows (Bosworth and Collins, 1999; Mody and Murshid, 2002). We re-estimate our basic growth regression taking into account the separate contribution of the four major categories of capital inflows: foreign direct investment (FDI), portfolio equity, debt flows, and official capital flows. The results are reported in columns 2 through 5 in Table 10.

We find that FDI flows to emerging countries is the only category of foreign capital that provides a positive and statistically significant contribution to growth in developing countries, with a coefficient estimate that is identical to the one obtained for total private capital flows. Economically, we find that a one standard deviation increase in the ratio of FDI inflows to GDP (equal to 0.019) enhances growth by 0.32 percentage points per year (that is, 1.59 percentage points over a five-year period). On the other hand, the coefficients of portfolio and debt flows are not statistically significant, with the former being negative and the latter being positive. Finally, the ratio of official capital flows to GDP exerts a significant and negative contribution to growth.[29] Hence the composition of foreign capital flows matters very much.

6. Conclusions

The present paper provides new empirical evidence on macroeconomic policies and outcomes in Latin America and the Caribbean, based on recent data for the region and the world at large. We evaluate the role of macroeconomic policies in LAC over the last decade in two dimensions. First, we analyze the determinants of macroeconomic policies as well as their stability. Here we highlight the increasing role of credibility in monetary and fiscal policies. Second, we

[29] Boone (1996) finds that foreign aid has not raised growth rates in developing countries. On the other hand, Burnside and Dollar (2001) find that foreign aid is effective in enhancing growth of GDP per capita in countries with good fiscal, monetary, and trade policies.

assess the impact of these policies on macroeconomic performance. We evaluate the importance of exchange rate regimes on inflation and growth, the impact of growth policies on real exchange rates, and the extent of international financial integration in LAC. Below is a brief summary of our main findings.

(i) Monetary and fiscal policies could be counter-cyclical in emerging countries. We show that their cyclical stance depends on country fundamentals and policy credibility. Fiscal and monetary policies are counter-cyclical in emerging economies with low to moderate country-risk spreads.

(ii) Inflation rates and inflation target misses decline after the adoption of inflation targeting. Controlling for external good or bad luck, country success in meeting inflation targets is strengthened by central bank independence and lower country-risk spreads.

(iii) Intermediate exchange-rate regimes became less persistent than hard pegs and floats in LAC after the Asian crisis. In addition, most LAC countries switched from intermediate to floating regimes during the 1998-2002 period.

(iv) The choice of exchange-rate regimes and their transitions do matter for inflation and growth. Inflation in LAC is lower if the regime is less flexible, whereas growth in LAC is higher if the regime is more flexible. On the other hand, while inflation is higher and growth is lower during transitions from hard pegs to intermediate regimes, the opposite is observed when switching from intermediate regimes to floats: inflation declines and growth rises during some transition years.

(v) We can not find support in favor of the Harrod-Balassa-Samuelson hypothesis, that is, shifts in sectoral productivity growth are unable to track RER movements in LAC. In addition, we show that the contribution of very successful structural reforms —reflected in a massive growth jump— to the correction of RER misalignments is small. The growth-induced RER correction is too little and too late to avoid speculative attack on an inflexible exchange rate.

(vi) There is strong evidence of growing integration of LAC into world financial markets, reflected by declining saving-investment correlations and increasing real interest rate convergence.

(vii) External factors are key in explaining long-term growth in emerging markets. Growth in LAC is enhanced by favorable terms of trade shocks, lower international interest rates, and larger private capital flows. External factors relative to domestic factors in LAC are the dominant cause of long-term growth, with a median contribution of 80% over the 1981-2000 period.

(viii) The composition of private capital flows is important for long-term growth in emerging countries. FDI inflows have a positive and significant impact on growth, whereas portfolio equity and debt flows have no significant effects.

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Appendix: Data Sources and Definitions

1. Sample of Countries

Industrial Countries (23): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

East Asia and the Pacific (13): China, Hong Kong, Indonesia, Korea, Lao P.D.R., Marshall Islands, Malaysia, Micronesia, Mongolia, Myanmar, Philippines, Singapore, Thailand.

Eastern Europe and Central Asia (25): Albania, Armenia, Azerbaijan, Bosnia, Belarus, Bulgaria, Croatia, Czech Rep., Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Rep., Latvia, Lithuania,

Macedonia, Moldova, Poland, Romania, Russian Fed., Slovak Rep., Slovenia, Tajikistan, Turkmenistan, Ukraine.

Latin America and the Caribbean (28): Argentina, Antigua and Barbuda, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Rep., Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Paraguay, St. Kitts and Nevis, St. Lucia, St. Vincent & the Grenadines, Suriname, Uruguay, Venezuela.

Middle East and North Africa (16): Algeria, Cyprus, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Saudi Arabia, Syria, Tunisia, Turkey.

South Asia (4): India, Nepal, Pakistan, Sri Lanka.

Sub-Saharan Africa (33): Benin, Botswana, Burundi, Burkina Faso, Cameroon, Central African Rep., Chad, Congo, Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Niger, Nigeria, Senegal, South Africa, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

2. The Data and Definitions

Section 2. The annual data used for Section 2.1 comprise a balanced panel of 11 developing countries (Argentina, Brazil, Chile, Colombia, Ecuador, Malaysia, Mexico, Peru, Philippines, Thailand, and Venezuela) for 1996-2002. The annual data used for Section 2.2 comprise an unbalanced panel of maximum 19 countries and maximum 12 years for 1990-2001.[30] Data sources are JP Morgan, central bank webpages and publications, the IMF's International Financial Statistics, and Bloomberg's Emerging Market Indexes.

The *real interest rate* is the nominal lending or policy interest rate[31] adjusted for CPI inflation. The *fiscal balance* is measured by the nominal fiscal balance as a ratio to nominal GDP.

[30] The world sample of IT countries is comprised by: Australia, Brazil, Canada, Chile, Colombia, Czech Rep., Hungary, Iceland, Israel, Korea, Mexico, New Zealand, Norway, Peru, Poland, Sweden, Switzerland, Thailand, and the United Kingdom

[31] In the case of Chile, we used the Monetary Policy Rate (*Tasa de Política Monetaria*) expressed in nominal terms, and for Mexico we used the 28-day CETES rate.

Output is measured by a real GDP index (1996=100). *Trend output* is the Hodrick-Prescott-filtered trend component of the real GDP index. The *country risk premium* is the EMBI+ stripped spread over U.S. treasuries. *Central bank formal independence* is a dummy variable that takes the value of 1 if the central bank is formally independent and zero otherwise.

The *inflation deviation* is the difference between annual actual inflation and the corresponding inflation target level. *Exchange rate deviations* are proxied by the difference between the effective nominal exchange rate and a one-step-ahead forecast obtained from an ARIMA model for each country. *Oil price deviations* are measured analogously. *U.S. GDP deviations* from trend are estimated using a Hodrick Prescott-filtered series obtained from 1970-2001 data.

Section 3. The *real effective exchange rate* is the nominal exchange rate multiplied by the world price index (expressed in US dollars) and divided by the domestic price index. The *nominal exchange rate (e)* is the average monthly price of the US dollar in local currency (line *rf* of the IMF's International Financial Statistics). Following standard practices, we use the consumer price index (CPI) for *domestic prices (p)* and wholesale prices for *foreign prices* (p^*). The weights for the multilateral index are based on the bilateral trade of the LAC countries with its i partners.

Section 4. We collect data on the *gross national saving rate* and *gross domestic investment rate* from the World Bank's World Development Indicators CD-ROM. Both variables are expressed as current-price ratios to GDP. We use Treasury bill rates or call / money rates as *domestic interest rates* for our selected countries during 1970-2002. The *international interest rate* is the Eurodollar London rate, corrected for the inflation in industrial economies. (Source: IMF, International Financial Statistics).

Section 5. We collected data for 56 developing countries with five-year averages over the 1970-2000 period. Our different categories of long-run growth determinants are:

Structural Policies and Institutions. *Education* is measured by the rate of gross secondary school enrollment from Barro and Lee (2000). *Financial depth* is measured by the ratio of domestic

credit supplied by private financial institutions to GDP from Beck et al. (2000). *Trade openness* is measured by the ratio volume of trade (real exports plus imports) to real GDP, adjusted for country size (area and population), for whether it is landlocked, and for whether it is an oil exporter.[32] *Government burden* is proxied by the ratio of government consumption to GDP from the World Bank's World Development Indicators. Finally, we use the first principal component of four indicators reported by Political Risk Services in their publication International Country Risk Guide (ICRG) as our proxy for *governance*. They are the indicators on the prevalence of *law and order*, *quality of the bureaucracy*, *absence of corruption*, and *accountability of public officials*. All of them enter with almost identical weights in their first principal component.

Stabilization Policies. We use the *average inflation rate* as an inverse measure of price stability. The *real exchange rate overvaluation* is used to proxy external imbalances. This index is constructed following the methodology in Dollar (1992).

External Conditions. *Terms of trade shocks* are measured by the change in the terms of trade from the World Bank's World Development Indicators. The *international real interest rate* is proxied as the difference between the nominal euro-dollar rate in London (series 60d, country code 112 in the IMF's International Financial Statistics) and the CPI inflation in industrial countries (series 64, code 110).[33] Finally, the data on *foreign capital flows* and their components (*i.e.* foreign direct investment, commercial bank loans, and portfolio flows) are from the World Bank's Global Development Finance on a gross basis, although net of amortizations on account of principal repayments. Capital flows are expressed as ratio to host-country's GDP.

[32] See Loayza et al (2003) for the details on the computation of this adjusted degree of openness.
[33] Agénor et al. (2000) uses this variable to assess the link between movements in the world real interest rate and economic fluctuations in developing countries.

Figure 1

Saving-Investment Panel Correlations across the World

20-year Rolling Correlations, 1960-2001

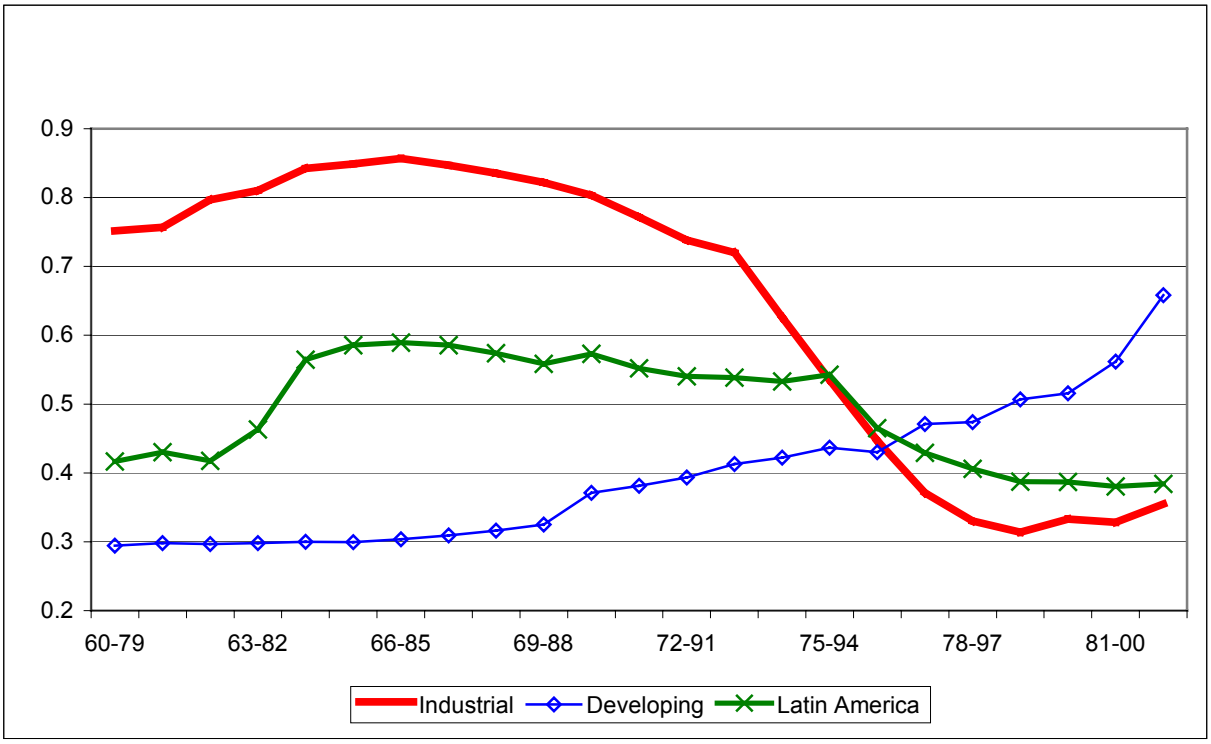

Figure 2

Real Interest Rate Differentials across the World, 1960-2002

20-Year Median of Absolute Differentials

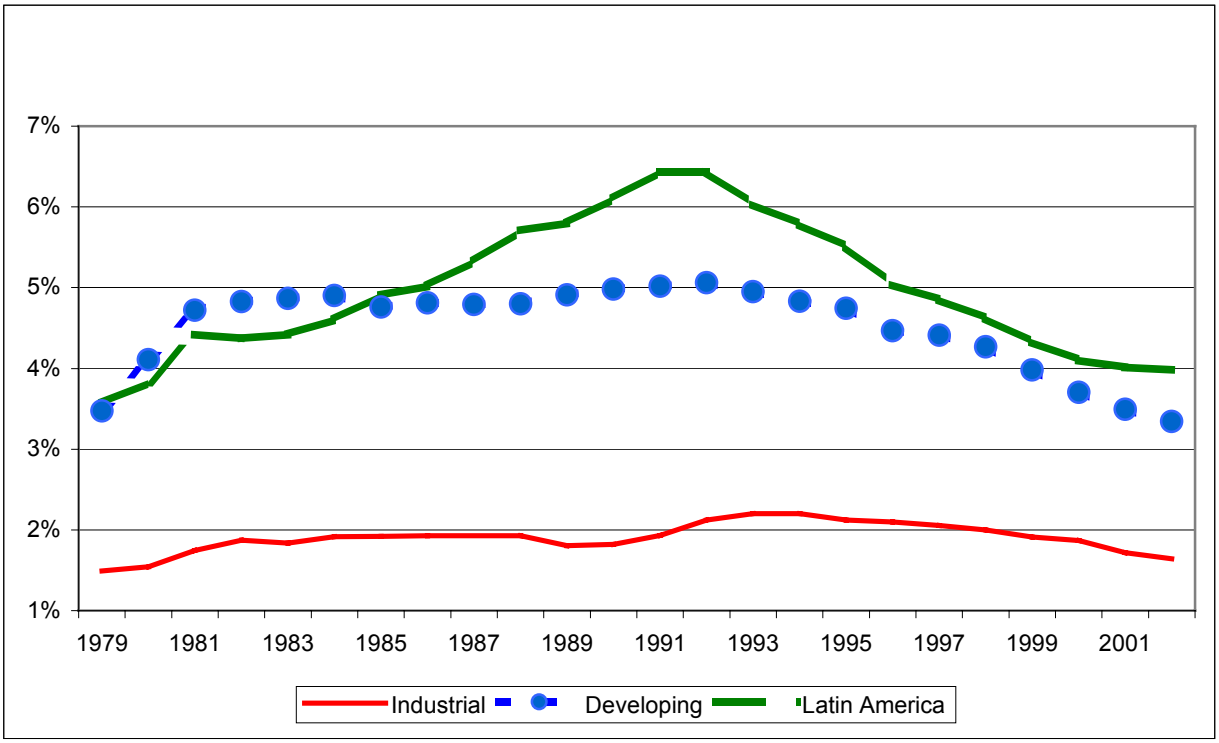

Table 1

Cyclical Stance of Monetary and Fiscal Policies in 11 Emerging Countries, 1996-2002

Dependent Variables: Interest Rate Deviation and Fiscal Balance Deviation
Sample of 11 Countries, annual data for 1996-2002 period
Estimation Method: GLS (Cross-section Weights)- Fixed Effects, Panel Data[1]
White-Heteroskedasticity-Consistent Standard Errors and Covariance

	Interest Rate Deviation		Fiscal Balance Deviation	
	Full Sample	Restricted Sample[a]	Full Sample	Restricted Sample[a]
Output Gap	73.02307** (2.369)	43.83110** (4.967)	18.69710** (1.386)	60.45749** (10.046)
Output Gap x Country Risk Spread	-0.02598** (0.003)	-0.05335** (0.021)	-0,00390** (0,0003)	-0.105271** (0,0225)
No. Countries	11	9	11	9
No. Observations	77	63	77	63
R^2 (unweighted)	0.07	0.02	0.35	0.51

[a] Excludes Argentina and Ecuador
[1] White's heteroskedasticity and autocorrelation consistent standard errors are reported in parenthesis.
** (*) Statistical significance at the 5 (10) percent level.

Table 2

Inflation Targeting Accuracy in 19 Inflation-Targeting Countries, 1990-2001

Dependent Variable: Absolute (squared) inflation deviations from annual target
Sample of 19 Inflation Targeting Countries, annual data for 1990-2001 period
Estimation Method: GLS (Cross-section Weights) Panel[1]
White-Heteroskedasticity-Consistent Standard Errors and Covariance

	Inflation Deviation	
	Absolute	Squared
Lagged Annual Inflation	0.03936** (0.010)	0.05490** (0.018)
Output Gap* Country Risk Spread	0.01719 (0.011)	0.00250** (0,001)
Absolute (Squared) Deviation in Oil Prices	0.00080 (0.002)	0.00004** (0.000)
Central Bank Formal Independence Dummy	-0.34405** (0.084)	-0.35989** (0.045)
Country Risk Spread	0.28517** (0.034)	0.30429** (0.072)
No. Countries	19	19
No. Observations	103	103
R^2 (unweighted)	0.41	0.31

[1] White's heteroskedasticity and autocorrelation consistent standard errors are reported in parenthesis.
** (*) Statistical significance at the 5 (10) percent level.

Table 3

Regime Transitions in Latin America: Transition Matrices[1]

Sample of 28 Latin American countries

	Changes in 1 year			Changes in 5 years		
	Hard Peg	Intermediate	Floating	Hard Peg	Intermediate	Floating
1974-2002						
Hard Peg	**0.9492**	0.0169	0.0339	**0.8031**	0.0965	0.1004
Intermediate	0.0082	**0.8807**	0.1111	0.0260	**0.6458**	0.3281
Floating	0.0226	0.1041	**0.8733**	0.0464	0.3814	**0.5722**
1990-2002						
Hard Peg	**0.9722**	0.0093	0.0185	**0.8772**	0.0439	0.0789
Intermediate	0.0065	**0.8954**	0.0980	0.0147	**0.5294**	0.4559
Floating	0.0357	0.1548	**0.8095**	0.0211	0.3474	**0.6316**
1990-1997						
Hard Peg	**0.9692**	0.0154	0.0154	**0.9524**	0.0476	0.0000
Intermediate	0.0115	**0.9425**	0.0460	0.0139	**0.8472**	0.1389
Floating	0.0328	0.2131	**0.7541**	0.0649	0.4286	**0.5065**
1998-2002						
Hard Peg	**0.9767**	0.0000	0.0233	**0.8485**	0.0000	0.1515
Intermediate	0.0000	**0.8333**	0.1667	0.0000	**0.3333**	0.6667
Floating	0.0435	0.0000	**0.9565**	0.0000	0.3404	**0.6596**

[1] Own calculations based on Markov transition matrices.

Table 4

The Impact of Exchange Rate Regimes on Inflation

Dependent Variable: Annual CPI Inflation[1]
Estimation: Instrumental Variables (IV) Panel[2]
Annual Data, 1974-2001

	All Countries[3]		Latin America	
Variable	De Jure	De Facto	De Jure	De Facto
Lagged Inflation	0.57451**	0.57112**	0.55879**	0.54212**
	(0.013)	(0.014)	(0.025)	(0.025)
GDP Growth	-0.34273**	-0.36491**	-0.64218**	-0.63373**
	(0.032)	(0.035)	(0.068)	(0.069)
Money Growth	0.28684**	0.28261**	0.33957**	0.33444**
	(0.013)	(0.013)	(0.025)	(0.025)
Openness	-0.00954**	-0.00727*	-0.02860**	-0.00891
	(0.004)	(0.004)	(0.009)	(0.010)
Fixed Regimes	-0.02538**	-0.02510**	-0.05609**	-0.04255**
	(0.008)	(0.008)	(0.013)	(0.018)
Intermediate Regimes	-0.03241**	-0.05020**	-0.04128**	-0.0875**
	(0.013)	(0.008)	(0.016)	(0.017)
R^2	**0.8002**	**0.8068**	**0.8781**	**0.8815**
Observations	**2187**	**1963**	**643**	**637**
Long Pegs	-0.04005**	-0.02943**	-0.07199**	-0.03658**
	(0.009)	(0.008)	(0.015)	(0.016)
Fixed - Long Pegs	-0.01579**	-0.02087**	-0.05311**	-0.04485**
	(0.007)	(0.005)	(0.014)	(0.010)
Intermediate Regimes	-0.03593**	-0.04785**	-0.04111**	-0.03531*
	(0.014)	(0.009)	(0.020)	(0.019)
Hard Pegs	-0.04130**	-0.03094**	-0.07205**	-0.01934
	(0.009)	(0.008)	(0.016)	(0.016)
Long - Hard Pegs	-0.03072**	-0.00997*	-0.02391**	-0.03848**
	(0.008)	(0.006)	(0.012)	(0.011)
Fixed - Long Pegs	-0.03179**	-0.01788**	-0.05022**	-0.04671**
	(0.009)	(0.005)	(0.019)	(0.010)
Intermediate Regimes	-0.03606**	-0.04922**	-0.04112**	-0.03949**
	(0.014)	(0.009)	(0.021)	(0.019)

[1] The inflation rate is defined as the ratio of $\pi/(1+\pi)$, where π is the rate of change of the CPI.
[2] White's heteroskedasticity and autocorrelation consistent standard errors are reported in parenthesis.
[3] Full sample regression includes regional dummies for Latin America, Africa, and Transition Economies.
** (*) Statistical significance at the 5 (10) percent level.

Table 5

The Impact of Exchange Rate Regimes on Economic Growth

Dependent Variable: Growth rate in GDP per capita
Estimation: Instrumental Variables (IV) Panel[1] Annual Data, 1974-2001

	All Countries[2]		Latin America	
Variable	De Jure	De Facto	De Jure	De Facto
Lagged Growth	0.21870**	0.19550**	0.22211**	0.21823**
	(0.019)	(0.020)	(0.038)	(0.038)
Investment	0.08938**	0.09556**	0.13763**	0.12557**
	(0.011)	(0.012)	(0.027)	(0.027)
Openness	0.00277	0.00198	0.00187	0.00306
	(0.003)	(0.003)	(0.005)	(0.005)
Government Burden	-0.04910**	-0.08076**	-0.05306*	-0.07122**
	(0.016)	(0.018)	(0.034)	(0.034)
Terms of Trade Shocks	0.02901**	0.02769 **	0.03057 **	0.02964 **
	(0.008)	(0.009)	(0.015)	(0.015)
Fixed Regimes	-0.01513**	-0.00596**	-0.00332*	-0.01680**
	(0.004)	(0.001)	(0.002)	(0.008)
Intermediate Regimes	-0.04200**	0.01067*	-0.01626**	-0.02137**
	(0.017)	(0.006)	(0.007)	(0.009)
R^2	**0.1757**	**0.1784**	**0.2639**	**0.2695**
Observations	**2304**	**2102**	**667**	**669**
Long Pegs	-0.01444**	-0.00244*	-0.00835*	-0.01927**
	(0.005)	(0.002)	(0.005)	(0.001)
Fixed - Long Pegs	-0.01049**	-0.00702**	-0.00101	-0.01213**
	(0.005)	(0.003)	(0.001)	(0.006)
Intermediate Regimes	-0.05728**	0.00905	-0.01832**	-0.02137**
	(0.018)	(0.006)	(0.006)	(0.009)
Hard Pegs	-0.01194**	-0.00598**	0.00668	-0.01891**
	(0.005)	(0.002)	(0.009)	(0.009)
Long - Hard Pegs	-0.01205**	-0.00434*	-0.01374*	-0.01677**
	(0.005)	(0.002)	(0.007)	(0.006)
Fixed - Long Pegs	-0.01540**	-0.00663*	-0.01766*	-0.00919*
	(0.006)	(0.004)	(0.011)	(0.006)
Intermediate Regimes	-0.05605**	0.00641	-0.01892**	-0.01726**
	(0.018)	(0.006)	(0.005)	(0.006)

[1] White's heteroskedasticity and autocorrelation consistent standard errors are reported in parenthesis.
[2] Full sample regression includes regional dummies for Latin America, Africa, and Transition Economies.
** (*) Statistical significance at the 5 (10) percent level.

Table 6

Transitory Inflation and Growth after Switching Exchange Rate Regimes

Estimation Method: Individual Fixed Effects Panel

Variable	Year of the Switch (T)	The Aftermath					
		T+1	T+2	T+3	p-value[3]	R^2	Observations
I. From Hard Peg to Intermediate Regime[1]							
Inflation	0.02316	0.02126	0.06942 **	0.08186 **	(0.037)	0.3915	121
	(0.030)	(0.030)	(0.032)	(0.034)			
Growth	-0.02716**	-0.01398	-0.00145	0.00394	(0.561)	0.4252	142
	(0.011)	(0.011)	(0.011)	(0.012)			
II. From Intermediate to Floating Regimes[2]							
Inflation	-0.01083	-0.01735*	-0.00280	0.00648	(0.260)	0.5904	146
	(0.011)	(0.011)	(0.010)	(0.011)			
Growth	-0.00766	0.01344	0.01988*	0.01177	(0.277)	0.3850	147
	(0.011)	(0.011)	(0.011)	(0.011)			

[1] We include 24 cases of regime switches: Australia (1975), Burundi (1984), Botswana (1980), Guinea (1991), Guinea Bissau (1984), Equatorial Guinea (1980), Guyana (1982), Honduras (1985), India (1976), Ireland (1979), Jamaica (1983), Jordan (1989), Korea (1980), Kuwait (1975), Liberia (1999), Sri Lanka (1991), Madagascar (1982), Malaysia (1976), Nicaragua (1993), Nepal (1978, 1995), Pakistan (1982), Zimbabwe (2001).

[2] We include 28 cases of regime switches: Algeria (1988), Australia (1983), Chile (2000), China (1981), Colombia (1984, 2000), Czech Republic (1997), Dominican Republic (1983), El Salvador (1983), Greece (1981), Guinea (2000), Iceland (2001), Iran (1977), Italy (1976), Japan (1978), Madagascar (1985), Malaysia (1998), Myanmar (1983), New Zealand (1985), Paraguay (1982), Poland (2000), Singapore (1999), Suriname (1982), Slovakia (1999), Sweden (1993), Syria (1982), the United States (1978), Zimbabwe (1983).

[3] The p-value tests the joint statistical significance of the dummy variables T+1, T+2, and T+3. White's heteroskedasticity and autocorrelation consistent standard errors are reported in parenthesis.

** (*) Statistical significance at the 5 (10) percent level.

Table 7

Sectoral Productivity Shifts and Real Exchange Rate Movements: The HBS Hypothesis[1]
(Average annual growth rates)

	1991-2000		1991-1995		1996-2000	
	Predicted Change	**Actual Change**	**Predicted Change**	**Actual Change**	**Predicted Change**	**Actual Change**
Country						
Argentina	0.47%	-6.40%	2.41%	-10.74%	-1.47%	-2.07%
Bolivia	3.12%	-1.67%	4.72%	-0.84%	1.53%	-2.50%
Brazil	-0.53%	3.37%	0.29%	0.17%	-1.35%	6.57%
Chile	-0.21%	-2.92%	0.86%	-5.06%	-1.29%	-0.78%
Colombia	0.25%	-3.33%	3.02%	-7.89%	-2.52%	1.24%
Costa Rica	-0.99%	-1.82%	-1.00%	-2.41%	-0.98%	-1.23%
Dominican Republic	0.10%	-2.25%	-2.29%	-2.64%	2.49%	-1.87%
Ecuador	-1.29%	0.85%	-1.62%	-6.73%	-0.96%	8.44%
Honduras	-2.43%	-2.59%	-3.54%	-0.14%	-1.32%	-5.04%
Jamaica	0.62%	-3.04%	0.38%	0.52%	0.86%	-6.60%
Mexico	0.02%	-2.33%	-0.44%	3.91%	0.48%	-8.57%
Panama	-2.92%	0.23%	-4.42%	4.04%	-1.42%	-3.59%
Peru	-2.34%	-2.37%	-2.61%	-5.78%	-2.07%	1.03%
Paraguay	-0.36%	-1.46%	0.11%	-5.11%	-0.82%	2.19%
El Salvador	-2.41%	-4.56%	-3.25%	-5.26%	-1.58%	-3.86%
Trinidad & Tobago	-0.01%	-0.59%	-0.13%	1.72%	0.11%	-2.89%
Uruguay	0.12%	-6.76%	-0.08%	-11.51%	0.31%	-2.01%
Venezuela	-1.25%	-7.30%	2.62%	-7.96%	-5.12%	-6.65%
Median LAC	**-0.29%**	**-2.35%**	**-0.11%**	**-3.85%**	**-1.14%**	**-2.04%**

[1] Calculations are based on equation (4) in section 3.3.

Table 8

Productivity Gains from Reforms and Equilibrium Trends According to the HBS Hypothesis
(Average annual growth rates)

Productivity Growth[1]	Domestic country			Foreign country			Trend RER
	$\hat{A}$	$\hat{A}_T$	$\hat{A}_N$	$\hat{A}^*$	$\hat{A}_T^*$	$\hat{A}_N^*$	$\hat{q}(HBS)$
High	2.2	2.4	2.0	2.4	1.7	2.6	-0.8
Low	-1.6	-3.2	-0.6	2.4	1.7	2.5	0.9

[1] High productivity growth represents the 75th percentile of the average annual labor productivity growth in LAC in the 1990s and low productivity growth represents the 25th percentile. Calculations are based on equation (5) in section 3.3.

Table 9

Real Interest Rate Differentials for Selected Developing Countries[1]

Annual Data, 1970-2002
Estimation Method: OLS[2]

	Constant	Dummy 1990-2002	AR Coefficient	AR Coeff. x Dummy	R^2/ No. Obs	Long-Run Differential[3]	
Country					.	Pre-1990	1990-2002
I. Latin America						**0.13**	**0.03**
Argentina	0.58146 (0.603)	-0.54306 (0.606)	1.35109 (0.018)	-1.41221 (0.017)	0.6815 22	1.66	0.04
Brazil	0.18147 (0.127)	-0.04311 (0.138)	1.07549 (0.148)	-0.79650 (0.158)	0.5998 21	2.40	0.19
Chile	0.01385 (0.015)	0.01601 (0.017)	0.17317 (0.125)	-0.69113 (0.238)	0.0984 27	0.02	0.02
Costa Rica	-0.03666 (0.014)	0.02320 (0.016)	0.20698 (0.034)	-0.18808 (0.370)	0.5506 20	0.05	0.01
Ecuador	-0.11978 (0.039)	0.07375 (0.044)	0.18784 (0.158)	0.39884 (0.285)	0.3294 19	0.15	0.11
Honduras	-0.0015 (0.015)	-0.00554 (0.019)	(0.801)	-0.91763 (0.914)	0.2466 19	0.01	0.01
Mexico	-0.15551 (0.067)	0.19340 (0.073)	-0.20487 (0.404)	0.08988 (0.483)	0.3766 20	0.13	0.03
Peru	0.09886 (0.010)	-0.07400 (0.000)	1.05791 (0.009)	-0.56254 (0.110)	0.9736 14	1.71	0.05
Trinidad & Tobago	-0.02150 (0.010)	0.03205 (0.010)	0.78563 (0.092)	-0.69810 (0.179)	0.8216 36	0.10	0.01
II. East Asia						**0.02**	**0.02**
Indonesia	-0.01692 (0.009)	0.03625 (0.015)	0.14245 (0.141)	-0.18892 (0.205)	0.2655 26	0.02	0.02
Korea	-0.00735 (0.010)	0.01390 (0.011)	0.46529 (0.243)	0.28545 (0.272)	0.4902 25	0.01	0.03
Malaysia	-0.01779 (0.007)	0.01775 (0.008)	0.36502 (0.244)	0.17006 (0.349)	0.2482 34	0.03	0.00
Philippines	-0.03539 (0.025)	0.04932 (0.027)	0.04724 (0.293)	0.05310 (0.458)	0.1891 25	0.04	0.02
Singapore	-0.00706 (0.009)	0.00016 (0.010)	0.33545 (0.332)	-0.06821 (0.399)	0.1098 30	0.01	0.01
Thailand	-0.00007 (0.009)	0.00433 (0.011)	0.56898 (0.198)	-0.16862 (0.288)	0.2853 25	0.00	0.01

[1] The real international interest rate is proxied by the Eurodollar London Rate corrected for the inflation rate of industrial countries.
[2] White's heteroskedasticity and autocorrelation consistent standard errors are reported in parenthesis.
[3] Long-run real interest rate differentials are reported in absolute value.

Table 10
Growth in Developing Countries

Dependent Variable: Growth Rate of GDP per capita
Sample of 56 emerging countries, 5-year non-overlapping observations for the 1970-2000 period
Estimation Method: GMM-IV System Estimator for Panels[1]

			Private Capital Flows (% GDP)		Official Flows
Variable	Total	FDI	Portfolio	Debt	(% GDP)
Constant	0.12783**	0.12124**	0.12629**	0.11915**	0.16060**
	(0.019)	(0.022)	(0.024)	(0.021)	(0.027)
Initial GDP (logs)	-0.00929**	-0.01073**	-0.00919**	-0.00827**	-0.01438**
	(0.002)	(0.003)	(0.004)	(0.003)	(0.004)
Secondary Enrollment	0.01078**	0.01369**	0.01105**	0.01087**	0.01412**
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
Credit to GDP ratio	0.00063	0.003**	0.00286	0.00311	0.00439**
	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)
Openness	-0.01365**	-0.01414**	-0.01515**	-0.01299**	-0.01958**
	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)
Government Burden	-0.01056**	-0.01318**	-0.01452**	-0.01749**	-0.00928**
	(0.004)	(0.004)	(0.004)	(0.003)	(0.005)
Governance	0.00686**	0.00667**	0.00807**	0.00743**	0.00779**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Inflation Rate	-0.01585**	-0.01565**	-0.01714**	-0.01735**	-0.01543**
	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)
RER Overvaluation	-0.00434**	-0.00273	-0.00272	-0.00433**	-0.00252*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Terms of Trade Shocks	0.06856**	0.07132**	0.07268**	0.06624**	0.08142**
	(0.012)	(0.017)	(0.014)	(0.011)	(0.014)
World Real Interest Rate	-0.76717**	-0.84716**	-0.75097**	-0.77932**	-0.7539**
	(0.104)	(0.112)	(0.091)	(0.095)	(0.103)
Capital Flows (% GDP)	0.16639**	0.16750**	-0.03162	0.03611	-0.07683**
	(0.050)	(0.067)	(0.033)	(0.039)	(0.032)
No. Countries	56	56	56	56	56
No. Observations	221	221	221	221	221
SPECIFICATION TESTS (P-values)					
(a) Sargan Test:	(0.767)	(0.791)	(0.832)	(0.848)	(0.829)
(b) Serial Correlation:					
First Order	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Second Order	(0.678)	(0.412)	(0.375)	(0.438)	(0.424)

[1] White's heteroskedasticity and autocorrelation consistent standard errors are reported in parenthesis.
**(*) Statistical significance at the 5 (10) percent level.

Table 11

Sources of Growth in LAC, 1981-2000[1]
(Annual average growth rates)

Period	Actual Growth	Predicted Growth	Transitional Convergence	Structural Factors	Macro Stability	External Factors
1981-85	-4.25	-2.43	-0.15	0.05	-0.06	-2.28
1986-90	1.49	0. 43	0.07	0.06	0.06	0.25
1991-95	1.49	1. 37	0.00	0.17	0.06	1.14
1996-00	-1.39	-0. 44	-0.07	-0.02	0.08	-0.42

[1] Computation of the sources of growth is based on the regression results reported in column 1 of Table 10.

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