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Capital Flows Cycle: Stylized Facts and Empirical Evidences for Emerging Market Economies*

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Abstract

In the 1990s, several emerging market countries have faced a cycle of large capital inflows followed by sharp reversals. This cycle occurred almost simultaneously to groups of these economies. Studies on this issue have restricted mostly to reversals, while this paper includes the phase of inflows to study the behavior of affected economies related to them, concerning developments of macroeconomic variables. Empirical tests showed that, initially, during inflow phase, countries had experienced strong GDP growth; but then, with reversal, GDP contracted steeply. Inflows helped to stabilize inflation while, for economies with less flexible exchange regimes, reversals forced some of them to let their currency float, causing sharp depreciation and acceleration of inflation. Large inflows might have produced distortions in the affected economies that contributed to severe adjustments with reversals. In this process of inflow-reversal, external factors beyond the control of emerging markets could have a role.

Keywords: Sudden Stops; Capital Flows; Inflation; GDP Growth
JEL Classification: F32, F34, E44

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1 – Introduction

Emerging market countries have faced a sequence of financial crises since the mid-1990s, namely the Mexican (1994-5), the Asian (1997), the Russian (1998), the Brazilian (1999) and the Argentine (2002) crises. These events affected mostly economies within the region of the crisis country but produced negative repercussions in others, as government and private firms of affected countries had lost access to the international capital markets – a phenomenon denominated "sudden stop".

In the case of the Mexican crisis, the most affected were the economies in Latin America, such as Argentina, Brazil and Uruguay. In the Asian crisis, that started in Thailand, the financial turmoil spread into other emerging countries in the region, namely Philippines, Indonesia, Malaysia, and was also felt by those more advanced (Hong Kong, Korea and Singapore). In the transition economies, the Czech Republic was hit by a sudden stop of its own in 1997, even before the Asian crisis. The Russian crisis – in some respect, can be seen as sequel to the Asian crisis – hit a much larger group of countries, affecting directly neighboring economies such as Estonia, Latvia, Lithuania and Slovak Republic, as well as countries in Latin America (Argentina, Bolivia, Brazil, Chile, Colombia, Paraguay, Peru and Uruguay). This paper analyzes the behavior of economies not only in the aftermath of a sudden stop but also during the inflow phase concerning developments in macroeconomic variables, trying to raise another definition of sudden-stop.

A common feature of those sudden-stops was the fact that they were preceded by a period of large capital flows to countries hit by them. Calvo, Leiderman and Reinhert (1994) had already raised the problems emerging market countries would face to address the distortions caused by those flows. They indicated the limited policy choices for small open economies facing a surge in inflows. Macro and microeconomic factors could justify these flows that might have led to distortions and, sometimes, to financial crises. In the macroeconomic area, there was an asymmetry of economic performance between industrial and emerging economies. Because of weak economic activity in the industrial world in the first half of 1990s, policy interest rates in the major currencies were lowered. In emerging market countries, economies were stronger – near full

employment in several of them – reflected in tight monetary condition and growing asset prices. The combination of those developments could explain in macroeconomic terms the transference of financial resources from industrial to emerging economies. While alternatives for profitable investment in the industrial countries were scarce because of weak economic performance, new opportunities had attracted investors to emerging markets showing bright output performance. But excesses might also have happened, and those transfers were perhaps in amounts larger than justifiable by economic fundamentals, which might have caused major imbalances in the capital importing countries.

Emerging market economies that experienced surges in capital inflows in the 1990s had followed a path of a rise in consumption and investment, and an increase in real money balances and foreign exchange reserves, a real exchange rate appreciation, and a deterioration of the current account (Calvo, Leiderman and Reinhart (1994)). In the intertemporal model of consumption and saving in an open economy with capital mobility and perfect foresight, a fall in the world interest rate will induce income and substitution (intertemporal and intratemporal) effects, which would lead to an expansion in domestic demand and a deterioration of the current account. The expansion in demand will result in an increase in the relative price of non-traded goods, i.e. a real exchange rate appreciation. In a monetary economy, similar implications also arise from a temporary decline in the international nominal interest rate. This lowers the relative price of present versus future consumption, leading to a rise in consumption, deterioration in the current account, and real exchange rate appreciation. In such a process, imports increase prior to capital reversals, and they fall substantially in the year of crisis[1].

Milesi-Ferretti and Razin (2000) analyzed empirically the problem of the external crises with large nominal exchange rate devaluations and current account adjustment, and their impact on economic performance of low and middle-income countries. Their main findings were that reversals in current account imbalances are

[1] Guidotti, Sturzenegger and Villar (2003)

more likely to occur in countries that have run persistent current account deficits and that have low reserves and unfavorable terms of trade. With regards to GDP growth, performance after reversals tends to be better in more open economies and in countries whose real exchange rates were less appreciated prior to the reversals. One conclusion was that reversals are not systematically associated with declines in growth. Currency crises, in turn, are more likely to occur when reserves are low, real exchange rates are appreciated, and external conditions are unfavorable – such as high interest rates and low growth in industrial countries. Calvo, Izquerdo and Mejía (2003) blame the real exchange devaluation and dollarized liabilities as the determinants of the sudden stops.

Guidotti, Sturzenegger and Villar (2004) studied the issue of sizable reduction of capital flows and the resulting current account improvement. They analyzed which factors explain the fact that in some cases the adjustment in the current account comes through output and export growth and in some others through domestic absorption contraction. Imports grew in years prior to the crisis in all regions; then, they fell substantially in the year of crisis; and, in the aftermath, they in general recovered rather quickly. Significant differences were found between Asia and Latin America. Asian countries adjusted through export growth, while Latin America did so through import contraction. Degree of openness and financial dollarization could partly explain such a difference.

Studies have worked on different aspects of the capital inflow-reversal process but mostly on the determinants of the phenomenon and on the aftermath of sudden-stops. Many of them have addressed concerns of output losses relating it to imperfections in the emerging country. The effect on inflation has been studied, to a certain extent, in the particular issue concerning events of a currency crisis associated with a collapse of an exchange rate regime and the associated “pass-through” to prices. Our paper intends to analyze the behavior of economies not only in the aftermath of a sudden stop but also during the inflow phase concerning developments in macroeconomic variables, using a new definition of sudden-stop. We selected a set of countries that went through such a process and made empirical tests to analyze some common regularities experienced by them. We wanted to proof also that capital flows precedes the business cycle. Another objective of the paper is to capture regional

differences in the macro impact of the capital flows, especially between Latin American and East Asia.

The paper is organized as follows: section 2 presents the stylized facts about sudden stop episodes; section 3 shows the econometric methodology; and 4 presents the empirical results. Conclusions are presented in section 5.

2 – Stylized Facts

2.1 Capital Flow and GDP

A group of 25 emerging market countries with access to the international capital market was selected with quarterly data published in the International Monetary Fund's International Financial Statistics (IFS)[2] for many of them covering the period from the first quarter of 1991 to the forth quarter of 2002 – the period of output growth cycle of the US economy. Australia and New Zealand were also included to compare the behavior of their variables during the 1990s with those of emerging market economies. These two countries have similar features as those of developing countries for they are basically commodity exporters and have large gross external debt (77 percent of GDP for Australia and 108 percent of GDP for New Zealand in 2002). They had suffered no major turbulence during the financial shocks.

In Calvo, Izquerdo and Mejía (2003), the definition of sudden stops entails a fall of capital flow for at least two standard deviations below the sample mean. In our case we divided the annual change by the standard deviation, obtained a normalized measure of capital flows. However the most important feature of our measure is to treat the inflows and the outflows symmetrically. This feature is important because our goal is analyse the macroeconomic impact of capital flow prior to the sudden stop.

The variable that characterizes sudden-stops was calculated from the series of capital inflows listed in the IFS – defined as the sum of two items (i) current account

[2] Argentina, Brazil, Chile, Colombia, Croatia, Czech Republic, Ecuador, Estonia, Hungary, Indonesia, Korea, Latvia, Lithuania, México, Peru, Philippines, Slovak Republic, South Africa and Thailand. Other relevant countries like Hong Kong SAR, Malaysia, Poland, Russia, Singapore and Turkey were not considered because of insufficient data.

and (ii) changes in foreign reserves[3]. The series were smoothed at each quarter by taking the accumulated four quarters (equivalent to one year) flows to minimize seasonal effects contained in the current account flows. The change in capital flows at each quarter was calculated as the difference between the four-quarter flow in the considered period (t) minus the flow at (t-4). Because of the methodology, the series thus covers a period from the fourth quarter of 1991 to the fourth quarter of 2002. Average and standard deviation of such a sample were computed, assuming that the average capital flows in 11 years might have converged to the equilibrium level for the period studied. At each quarter, a variable *fsd* is computed as the deviation of change in flows from average divided by the standard deviation of the sample.

$$fsd_t = \frac{(capflow_t - capflow_{t-4}) - \overline{capflow}}{s\tan dart \quad deviation(capflow)}$$

An event of sudden stop would occur when the variable *fsd* is, at least once, below minus two – i.e. local change in flows is around or exceeds two standard deviations from the average – and there is a sharp deceleration in output growth rate in the period.

Countries were divided in geographic regions to avoid heterogeneity problems and to capture common and different patterns within each region. The three regions considered included the following countries:

Latin America – Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru

Asia – Indonesia, Korea, the Philippines, Thailand, South Africa;

Transition Economies – Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, the Slovak Republic.

Episodes in Latin America, Asia and European transition economies in the 1990s showed that the process of capital inflows and their reversals could be associated respectively with the pattern of accelerated output growth and its sharp contraction.

Table 1 shows how the new variable (*fsd*) works in Latin America. The quarterly change in capital flows for Mexico in 1995 was near minus two standard deviations from the average, and the economy suffered a major recession in those

[3] In IFS it stands for financing the country

quarters. Similar developments were also observed in Argentina and Brazil, but the deviation from the average did not reach the Mexican values, although there was a recession in Argentina. In the years 1998-99, the *fsd* was around minus two for Brazil, Chile and Peru, with a lesser effect in Argentina, Colombia and Mexico. The recession was spread around the region with the exception of Mexico. For Argentina, the *fsd* extreme value was reached in 2001, following a long period of deceleration in GDP growth, perhaps as a lagged consequence of the 1998-99 shock.

In Latin America, Brazil faced capital reversals in three occasions since 1994: in 1994-95 as a consequence of the Mexican crisis, in 1998-1999 with the combination of Asian and Russian crises, and in 2002 with impact of three factors, namely, the crisis in Argentina, turmoil in the major financial centers and its own domestic economic uncertainties (see figure 1). In each of these events, the economy behaved differently. The economy went through a deceleration of GDP growth rate in the first two cases, while inflation pressure was pronounced only in the second case at the time of the shift in the exchange rate regime. More recently, in 2002, the effect on output was smaller, but inflation accelerated. Also, macroeconomic policy reaction differed. In the first two cases, there were changes in foreign exchange regime: from floating to pegged regime (Mexican crisis) and from pegged to floating regime (Asian/Russian crisis) under inflation targeting framework, while in the 2002 crisis the regime remained floating.

In other economies in the region, Mexico (Figure 2) had received increasing annual capital inflows since the early 1990s, which slowed in 1994 and reversed sharply in 1995. Output in turn accelerated from 1993 until its sharp contraction in early1995. Chile and Colombia faced a similar turnaround in capital inflows in 1999 with the deceleration starting in the second half of 1997 (figures 3 and 4). Output growth in these two economies was strong in the period of inflows, started slowing-down as inflows was followed by sharp contraction in 1999.

For testing for correlation and granger causality between capital flow and growth, we calculated output gap within each region and used it to compare with capital flow. The output for each country is regressed against common coefficients for the time trend and for seasonal dummies within each region, and output gap is the residual for each country.

It is not a very simple to task to calculate the causality between capital flows and growth. We are aware that capital flows react to anticipated growth prospects. Finding that capital inflows precede growth therefore does not prove causality. Anyhow we use the granger test to obtain some information if capital flow is important to anticipate growth.

Table 4 shows that correlation between capital flow and output gap for each country is negative in all the cases and inferior to -0.20 in 5 of the 7 Latin American countries analyzed. Causality direction is another important piece of information. Table 5 shows that capital flows are more like to granger cause output gap than vice-versa. In a window of two lags, only in one case we can reject this causality direction and only in Brazil there is some evidence that the output gap is important to preview capital flows.

In Asia (table 2), the shock occurred in 1997-98 with the *fsd* reaching values near minus two for Indonesia, Korea and Thailand with severe economy contraction, with a lesser impact on the Philippines. In New Zealand, change in capital flows reached a value below two once, in 1997, followed by a deceleration in GDP growth, while in Australia such an extreme value was reached only in the year 2000. For both Australia and New Zealand, such a number has to be considered with care because the volatility of capital flows as compared to emerging countries tends to be lower.

In Asia, Thailand, Korea and the Philippines had followed a similar path of strong output growth accompanied by capital inflows until 1996. Thailand and Korea had followed a path of both sharp contraction of output and reversal of capital (Figures 5 and 6), while the Philippines experienced a mild transition of slowing output and capital (Figure 7). The correlation between capital flows and the output gap, as one can see in Table 6 is negative, and inferior to -0.20 only in Korea but there is strong evidence in the causality direction. With 2 lags, capital flows are granger causing output gap in all countries at a 10% significance level. Output gap is not causing capital flow in any country (Table 7).

In transition economies (table 3), the shock seems to have occurred around 1998-99 for Croatia, Estonia, Lithuania and the Slovak Republic, capital flow effect was presented and only the Slovak Republic did not experience sharp contraction in GDP.

The Czech Republic had experienced a similar path in 1996-97 with the *fsd* reaching minus two in the last quarter of 1996. The tables showed that the financial shocks occurred almost simultaneously in each region with a characteristic that sudden stop events were preceded by a period of positive change in inflows above the average and acceleration of GDP.

In the transition economies, the Baltic countries presented similar paths of accelerating output growth, from mid 1997 through late 1998, followed by sharp deceleration. The correlation matrix in Table 8 shows that in 4 out of 7 countries there are negative and significant co-movements between capital flow and output gap, and granger causing tests show also that in 4 out of 7 capital flows are anticipating output gap in East Europe. (Table 9)

2.2 Capital Flow, Exchange rate and Real Interest Rate

In other emerging countries, the weighting between output and inflation might also have been influenced by policy actions in response to capital reversals taken by the government – including success in maintaining a more rigid exchange rate regime – and, if changed to floating rate, policy reaction to minimize the exchange rate fall. Previous to the emerging market crises in the 1990s, there was an understanding that an economy contemplating devaluation would weight the benefit of faster growth against the cost of faster inflation. But emerging market countries' experiences showed that a severe contraction in output is a possibility. In sum, among emerging countries affected by financial crisis, there were two distinct cases characterizing the reversal of capital inflows: those that were able to preserve fixed-rates, and those that faced a currency crisis and had to float. The adjustment in the former was felt mostly on output, while, in the latter, the effect was distributed between output and inflation. Figure 11 shows that in Thailand just after the reversal, *fsd* negative, there were a change in the exchange regime and inflation increased. As a contrasting case, one can see in Figure 12 that in Chile even in 1999 when *fsd* was at -2 there was no break in exchange rate and inflation was still going down. Colombia's case is very similar to Chile's, but Korea, the Philippines, Mexico, Brazil and Argentina are similar to Thailand with a shift in the exchange rate passing through inflation.

One can see in Figures for the cases of Thailand in 1997 and Chile in 1999 how real interest rate and *fsd* are moving in opposite directions. The correlation matrixes for each region are showing in tables 10, 11, and 12. There are also tests showing more evidence that capital flow is granger causing real interest rates in those countries than vice versa.[4] Hence our hypothesis is that when there is capital reversal, countries try to defend their currencies increasing interest rate.

Our empirical tests using econometric techniques in the next sections have the objective of evaluating how robust are the correlations between capital flows and output showed in the figures and also correlations of capital flow with exchange rate and real interest rate.

3 – Econometric Methodology

Our hypothesis, based on the stylized facts and also in line with Calvo, Leiderman and Reinhart (1994)), is that capital flows drives output. Capital flows are overly optimistic, and due to international liquidity financing a capital overbuilt. Latter with overheat economy and current account deficits any change in the international environment creates a speculative attack against the country's debt and currency. Some countries, only with monetary policy, are able to sustain the exchange rate regime and suffer only output losses others allowed a switch in exchange regime with bad outcomes in product and inflation.

With the objective of address the potential chain of events described above and to identify magnitude and significance of macro correlation shown in the figures, we ran the time series in a panel. Another goal of the panels is also to separate sudden stops from regular periods, and also to compare the phenomenon among regions. We are aware of potentially endogeneity problems in the panel estimations. It is not easy to sort out the relationship and direction of causality among capital flows and other variables. But even so we think its worthy to treat empirically those variables.

[4] For Latin American 2 out of 6 showing F/SD granger causes real interest rate and zero and vice versa. In Asia 2 out of 4 for the first case and one for real interest rate causing F/SD. In Europe 3 out of 7 showing F/SD granger causes real interest rate and zero and vice versa. The results are in Tables 13,14 and 15.

In dynamic panel estimations with lagged dependent variable on the right-hand side of the equation, standard panel estimators are known to be biased and inconsistent. Arellano and Bond (1991) suggest a consistent GMM procedure using as many orthogonality moments as possible. The consistency of the Arellano-Bond estimator, however, relies on the number of cross-section units being large. This is not the case for our sample. When we run the Arellano-Bond procedure considering one panel per region, most of the models rejected Sargan's overidentification test. So we preferred to put all countries studied in the same panel, regardless of the region to which they belong, and instead to consider regional dummies in the key variables to characterize differences of impacts of capital flows on each region. Moreover, we relied on Monte Carlo results reported by Nakane (2000) showing that Arellano-Bond procedure is not better than fixed effects for small number of cross-section terms. We, therefore, report fixed effects estimations as our main (benchmark) results.

To capture the impact of capital flows, during normal and sudden stop, we ran reduced form equations based on a very standard neo-keynesian structured model. It consists of 5 equations:

- IS curve;
- Phillips curve;
- Taylor Rule;
- Uncovered interest parity
- Capital flow equation.

To understand the impact of capital flow on output gap and the differences of these impacts in each region, we ran an IS curve in a panel with the output gap as the dependent variable:

$$gap_{j,t} = \alpha_j + \alpha_1 gap_{j,t-1} + \alpha_2 (lreal\ int) + \alpha_3 lexp_{j,t} + \alpha_4 \log cap_{j,t-1} + \alpha_5 d \log cap_{j,t-1} \cdot regdumm_{j,t-1} + u_{j,t}$$

In the right-hand side of equation (1), *lrealint* is the log of real interest rate, *lexp* is the log of exports and *logcap* is the log of capital flows. One important variable is the cross product between *fsd* and capital flow – called *dlogcap* in the regressions. If this variable is positive, it represents the capital inflow period and, if negative, the outflows.

It magnifies periods of large capital inflows and outflows. A regional dummy is also applied to *Dlogcap* to capture the difference between regions in the emerging country panel.

The Phillips curve is used in the panel to capture the influence of the sudden stops on prices controlling for exchange rate movements. Hence in the right hand side, we see the *logcap* variable and *exc* as the nominal exchange rate as expressed below:

$$\pi_{j,t} = \beta_j + \beta_1 \pi_{j,t-1} + \beta_2 [(exc_{j,t} - exc_{j,t-1}).regdumm + \beta_3 g_{j,t-1} + \beta_4 \log cap_{j,t-1} + \beta_5 dlogcap_{j,t-1}.regdumm_{j,t-1} + v_{j,t}$$

The product between nominal exchange rate and regional dummies is included in the panel to capture the difference in the pass-through among regions. The effect in each region of capital flow on inflation is captured by the last coefficient.

There are three more panels. The log of nominal exchange rate is on the left-hand side in order to capture the case in which, prior to sudden stop events, there are regional differences of the effects of capital flow on exchange rate.

$$lexc_{j,t} = \eta_j + n_1 lexc_{j,t-1} + \eta_2 lrealint_{j,t-1} + \alpha_3 lexp_t + n_2 \log cap_{j,t-1} + + \eta_2 d \log cap_{j,t-1}.regdum + w_{j,t}$$

The fourth panel has the real interest rate in the left hand side. In the stylized facts we notice how the interest rate reacts to capital flow, the objective of the panel is to test if other domestic variables also affect the real interest rate:

$$real\,\mathrm{int}_{j,t} = \eta_j + n_1 lrealint_{j,t-1} + \eta_2 lexc_{j,t-1} + +\eta_{\ 3} lexp_t + n_4 \log cap_{j,t-1} + + \eta_5 d \log cap_{j,t-1}.regdum + \eta_6 gap_{j,t-1}.regdumw_{j,t} + \eta_8 risk_{j,t-1} + v_t$$

The fifth panel is the one in which capital flow is on the left-hand side to test domestic and international influence on capital flow.

$$\log cap_{j,t} = \alpha_j + \alpha_1 \log cap_{j,t-1} + \alpha_2 exc_{j,t-1} + \alpha_3 gap_{j,t-1}.regdum + \alpha_4 exp_{j,t-1} + \alpha_5 risk_{j,t-1} + w_{j,t}$$

4 – Econometric Results

Before showing the results for the five panels, it is important to stress evidence for granger causing going from capital flow to output gap and from capital flow to real interest rate. The stylized facts that we showed in the last section suggest that capital inflow accelerates the economy, appreciates the exchange rate. In the reversal of capital flows, output decelerated, real interest rate spikes and inflation increases. The objective of the panel is to gather statistical evidence of these movements and regional patters.

In the IS curve panel we note that effect of capital flows on output is significant for both the Asian and Latin American countries in the sample, while such a correlation in transition economies seems to be absent. Table 16 shows that Latin America and Asia regional dummies on *dlogcap* have the expected sign and they are significant in the output gap panel, with the latter almost twice in terms of absolute value as regards to the former. It means that in both regions capital flow during the sudden stop crisis is important to explain output gap. *Logcap* presents also a significant negative coefficient showing that capital inflow is important for economic activity in the three regions also during the no sudden-stop period. Domestic real interest rate has no direct effect in the panel; log of exports shows a positive effect; and log of the nominal exchange rate a negative one. It is important to stress that we are more concerned about the regional effects of capital flows because there are problems concerning homogeneity of the variables for the global panel. Due to few cross section elements, however, we are not able to work on regional panels. We run, hence, the panel for all 18 countries studied. The R-square was around 0.60; but the R-square decreases to below 0.20 with inclusion of Australia, New Zealand and South Africa. The fixed effects for the 18 countries were significant.

Concerning the effect on inflation (table 17), we are more interested in the difference in the regional pass-through from exchange rate to inflation. In Latin America, the pass-through was 5.2 per cent and in Asia was 4.7 per cent, which are in

line with other results for pass-through.[5] *Logcap* presents a positive and significant coefficient showing that capital outflow increases inflation. Again in this panel, the R-square is around 0.60 and all the fixed effects are significant. In transition countries, the pass-through coefficient was not significant.

The results for the exchange rate (Table 18) are as expected showing the direction from capital flow to exchange rate in Latin America and Asia, i.e. positive signal means that capital inflow appreciates the exchange rate. The regional dummies in the *dlogcap* are significant and positive, which means devaluation during reversals.[6] The level of the domestic real interest rate presents negative correlation with exchange rate for the three regions as expected, meaning that an increase in real interest rate helps to "defend the currency". Fed-funds are negatively correlated with devaluation of the exchange rate, which is not the expected result.

The panel with real interest rate in the left-hand side is presented in Table 19 and has only expected results. Real interest rate increases with capital outflow and in the presence of sudden stops episodes with the same intensity in Latin America and Asia (negative and significant values for dlogcap*regdummies). The risk premium presents the expected sign as well, showing an increase of the real rate when the risk is going up. If one thinks in terms of Taylor rule type of behavior, the sign of output gap is right and of inflation is wrong.

Table 20 shows the panel with capital flow as the dependent variable. The important fact to observe is that if output gap presents a significant negative signal for Latin America and Asia on the right hand side, with is not in line with Granger causality results reported before. A positive signal for country risk premium (EMBI) is evidence that increasing liquidity in the world drives the flow of capital to securities of the three regions.

[5] Golfajn and Werlang (2000) found that Europe, Africa and Oceania have a substantial lower pass-through than Asia and Latin America.
[6] We tested a dummy separating fixed and floating regime in the exchange rate, but it was not significant.

In the annex (tables 21 to 32) there are panels for each region based on Arellano-Bond estimations. The results are robust and in line with fixed-effect panels commented above.

5 – Conclusions

In the 1990s, many emerging market countries had experienced a cycle of large inflow of capital in the initial phase followed by a period of sharp reversal. This cycle framed or intensified the behavior of main macroeconomic variables such as GDP growth and inflation. In fact, sudden and unexpected – at least in their magnitude – reversal of capital flows have led in some cases to a crisis situation with free-fall of the exchange rate and deep recession. Macroeconomic and structural problems, especially in the financial system, in the emerging countries themselves were considered the main causes of such disruptive process.

In the three regions (Latin America, Asia and East Europe), many countries experienced simultaneously the sharp reversal of capital preceded by a period of inflows of foreign capital above average. In the process, economies with different fundamentals were equally affected, which may indicate that, first, it was not a localized event and, second, it was not caused only by each country's specific factor. As it appeared to be of a more generalized nature, one could argue that a common factor, perhaps external to them (emerging markets) might have caused the problem. The presence of the variable measuring sovereign default risk (embi) in the capital flow panel could be the common factor that caused the contagion not only for the sudden stop and its aftermath period but also prior to it.

We developed a new concept in terms of sudden stops that not only captures the capital inflows and outflows but also shows the expected and statically correlation with output gap, nominal exchange rate, real interest rate and inflation.

Empirical tests using panel data showed that macroeconomic developments in emerging economies were determined by external capital flows. Capital flows appear to play an important role in the emerging markets business cycle. They boomed the economies during inflows and led them to recession in reversals. The tests indicate that,

in Latin America, the impact of capital flows was more relevant on inflation, while, in Asia, output was more affected. In transition economies, the results were less conclusive. The Granger causality tests allowed us to treat capital flow moving in advance to the output gap, exchange rate and real interest rate before and after the sudden stop.

References

Borensztein E. and J. de Gregorio, “Devaluation and Inflation after Currency Crises”, mimeo, IMF, 1999

Caballero Ricardo J. and Arvind Krishnamurthy, “Inflation Targeting and Sudden Stops”, mimeo February 2003

Caballero Ricardo J. and Arvind Krishnamurthy, “A Vertical Analysis of Monetary Policy in Emerging Markets”, mimeo March 2003

Calvo Guillermo, “Explaining Sudden Stop, Growth Collapse and BOP Crisis: A Case of Distortionary Output Taxes”. IMF Third Annual Research Conference. November 2002

Calvo Guillermo, L. Leiderman and C. Reinhart, “Inflows of Capital to Developing Countries in the 1990s: Causes and Effects”, IADB Working Paper 302, November 1994

Calvo Guillermo and C. Reinhart, “When Capital Inflows Come to a Sudden Stop: Consequences and Policy Options”, June 1999

Calvo Guillermo, A. Izquierdo and L-F Mejia "On the empirics of sudden stops" mimeo August 2003

Choudhri E.U. and D. S. Hakura, “Exchange Rate Pass-Through to Domestic Prices: Does the Inflationary Environment Matter?”, IMF Working Paper, WP/01/194, December 2001

Goldfajn I. and S. R. da C. Werlang, “The Pass-Through from Depreciation to Inflation: A Panel Study”, Central Bank of Brazil Working Paper Series, July 2000

Guidotti, P., F. Sturzennegger and A. Villar, “Aftermaths of Current Account Reversals: Export Growth of Import Contraction?” – mimeo 2003

Milesi-Ferretti G.M. and A. Razin, “Current Account Reversals and Currency Crises”, in “Currency Crises” ed. P. Krugman, NBER 2000, University of Chicago Press, 285-321

Nakane Márcio I. (2000): "Bank interest rates in Brazil: an empirical analysis". Texto para Discussão 12/2000. São Paulo: IPE-USP.

Odean T., “Volume, Volatility, Price, and Profit When All Traders Are above Average”, The Journal of Finance, Vol. 53, No. 6 (Dec., 1998), 1887-1934

Taylor J.B., “Low Inflation Pass-through, and the Pricing Power of Firms”, European Economic Review 44 (2000) 1389-1408

Table 1
Events of Sudden Stop - by region
Latin America

quarter	Argentina		Brazil		Chile		Colombia		Mexico		Peru	
	F/SD	output	F/SD	output	F/SD	output	F/SD	output	F/SD	output	F/SD	output
1992Q1									0,74	4,9%		
1992Q2									0,57	2,4%		
1992Q3									0,36	4,5%		
1992Q4									0,31	2,9%		
1993Q1									0,35	4,0%		
1993Q2									0,43	0,6%		
1993Q3									0,36	1,3%		
1993Q4									0,39	2,0%		
1994Q1	0,64	7,7%	0,74	4,0%					0,17	2,3%		
1994Q2	0,91	6,5%	0,86	2,5%					(0,53)	5,6%		
1994Q3	0,48	4,5%	0,51	5,8%					(0,42)	4,6%		
1994Q4	0,21	5,0%	(0,01)	10,9%					(1,23)	5,2%		
1995Q1	(0,55)	2,2%	(0,62)	10,8%					**(2,45)**	-0,4%		
1995Q2	(0,86)	-3,6%	(0,58)	7,2%					(1,91)	-9,2%		
1995Q3	(0,75)	-4,4%	0,54	1,7%					**(2,73)**	-8,0%		
1995Q4	(0,63)	-5,0%	1,11	-1,7%					(1,88)	-7,0%		
1996Q1	0,52	-0,6%	1,71	-2,2%					0,24	0,0%		
1996Q2	0,81	5,1%	1,70	1,4%					0,44	6,5%	0,33	2,6%
1996Q3	0,93	8,2%	0,10	6,3%					1,37	7,1%	1,04	2,3%
1996Q4	0,93	9,2%	(0,01)	5,0%	0,89	5,6%			1,45	7,1%	0,22	4,0%
1997Q1	0,47	8,4%	(0,55)	4,7%	1,62	4,3%			1,14	4,6%	1,07	6,7%
1997Q2	0,53	8,1%	(0,77)	4,8%	1,83	4,9%			1,18	8,4%	1,07	8,5%
1997Q3	0,69	8,4%	0,20	1,9%	1,79	8,3%			1,72	7,5%	(0,25)	6,1%
1997Q4	0,74	7,7%	(0,54)	1,9%	1,32	9,0%			1,77	6,7%	0,67	5,7%
1998Q1	0,76	6,0%	0,57	0,9%	(0,09)	6,3%	(0,30)	5,9%	0,80	7,5%	(0,90)	2,5%
1998Q2	0,63	6,9%	0,81	1,7%	(1,18)	5,7%	(0,77)	1,8%	0,65	4,3%	(0,79)	-2,6%
1998Q3	0,66	3,2%	(0,86)	0,1%	**(2,02)**	2,8%	(1,19)	-0,8%	(0,50)	5,3%	(0,44)	0,7%
1998Q4	0,49	-0,4%	(0,29)	-2,1%	**(2,30)**	-1,8%	(0,89)	-4,3%	(1,04)	2,7%	**(2,00)**	-2,4%
1999Q1	0,25	-2,5%	**(2,58)**	0,8%	**(2,20)**	-1,0%	(1,19)	-6,3%	(0,67)	2,0%	(1,98)	-0,2%
1999Q2	(0,02)	-4,9%	**(2,97)**	-0,3%	(0,94)	-3,8%	(1,62)	-6,6%	(0,92)	3,3%	**(2,54)**	1,1%
1999Q3	(0,58)	-5,1%	(0,52)	-0,5%	(0,80)	-1,6%	(1,94)	-3,3%	(0,76)	4,3%	**(2,34)**	-1,4%
1999Q4	(0,32)	-0,9%	(0,50)	3,3%	(0,94)	3,6%	(1,70)	-0,4%	(0,54)	5,2%	(0,89)	4,4%
2000Q1	(0,15)	-0,2%	1,48	5,3%	(0,16)	3,7%	(1,39)	2,2%	(0,49)	7,4%		
2000Q2	0,14	-0,4%	1,80	4,2%	(0,43)	4,7%	(0,46)	3,2%	(0,35)	7,3%		
2000Q3	0,36	-0,6%	0,81	4,1%	0,13	4,4%						
2000Q4	(0,48)	-1,9%	1,14	3,9%	0,87	3,9%						
2001Q1	(1,20)	-2,0%	0,59	3,8%	0,89	3,2%						
2001Q2	(1,70)	-0,2%	0,59	1,9%	0,45	4,1%						
2001Q3	**(2,21)**	-4,9%	0,12	0,4%	0,41	2,9%						
2001Q4	**(2,40)**	-10,5%	(0,69)	-0,7%	(0,28)	2,0%						
2002Q1	(1,99)	-16,3%	(0,95)	-0,5%	(0,69)	1,3%						
2002Q2	**(2,30)**	-13,5%	(1,23)	1,4%	(0,13)	1,7%						
2002Q3	(1,59)	-9,8%	(1,30)	3,0%	(0,29)	2,4%						

Source: IFS

Table 2
Events of Sudden Stop - by region
Asia

quarter	Indonesia		Korea		Philippines		Thailand		Australia		N. Zealand	
	F/SD	output	F/SD	output	F/SD	output	F/SD	output	F/SD	output	F/SD	output
1993Q1					0,43	0,7%			0,01	4,1%		
1993Q2					0,53	2,5%			0,14	4,4%		
1993Q3					0,11	2,7%			0,57	3,2%		
1993Q4					0,41	2,6%			0,57	3,7%		
1994Q1	0,08				0,20	3,6%	0,12	10,9%	0,48	4,1%		
1994Q2	0,15				1,16	4,6%	0,10	9,9%	0,69	4,6%		
1994Q3	0,27				1,12	5,1%	0,27	5,5%	0,81	6,3%		
1994Q4	0,23		0,32	9,0%	0,78	4,2%	0,29	9,7%	1,12	4,3%	1,54	4,6%
1995Q1	0,17		0,37	9,5%	0,47	4,8%	0,32	9,6%	1,63	3,1%	1,25	3,8%
1995Q2	0,61		0,51	9,8%	(0,21)	4,3%	0,69	12,3%	1,34	3,4%	1,21	4,1%
1995Q3	0,70		0,61	9,8%	(0,32)	6,0%	0,66	9,6%	0,82	3,6%	0,67	4,4%
1995Q4	0,65		0,36	7,0%	(0,41)	3,8%	0,87	5,9%	0,62	4,1%	0,16	3,4%
1996Q1	0,81		0,41	7,1%	0,50	5,2%	1,19	4,7%	(0,55)	5,1%	0,37	3,3%
1996Q2	0,53		0,49	6,8%	1,01	6,6%	0,54	6,5%	(0,43)	4,1%	1,46	2,9%
1996Q3	0,39		0,17	6,5%	1,46	6,1%	0,31	7,8%	0,12	4,0%	1,99	3,6%
1996Q4	0,62		0,45	6,7%	1,72	5,6%	(0,23)	4,6%	(0,20)	4,0%	1,43	4,1%
1997Q1	0,38		0,26	4,9%	0,94	5,5%	(0,85)	1,0%	0,51	2,9%	0,50	2,2%
1997Q2	0,34		(0,07)	6,2%	(0,35)	5,6%	(1,39)	-0,6%	0,21	4,3%	(1,18)	4,6%
1997Q3	0,11		(0,17)	5,5%	(0,92)	4,9%	**(2,11)**	-1,6%	(0,64)	3,7%	**(2,32)**	3,7%
1997Q4	(1,71)		**(2,08)**	3,6%	(1,89)	4,7%	**(2,77)**	-4,2%	(0,47)	4,3%	(1,78)	2,1%
1998Q1	**(2,73)**	-3,3%	**(2,50)**	-4,6%	(1,76)	1,1%	**(3,18)**	-7,1%	(0,83)	5,3%	(0,80)	1,2%
1998Q2	**(3,11)**	-14,5%	**(2,85)**	-8,0%	(1,08)	-0,9%	**(2,52)**	-13,9%	(0,40)	4,5%	(0,41)	-2,1%
1998Q3	**(3,21)**	-16,2%	**(2,88)**	-8,1%	(1,12)	-0,8%	(1,50)	-13,9%	(0,09)	5,3%	(0,27)	-1,9%
1998Q4	(0,42)	-17,6%	0,00	-6,0%	(0,25)	-2,2%	(0,04)	-7,2%	0,15	6,2%	(0,79)	0,7%
1999Q1	1,39	-7,7%	0,91	5,8%	(0,18)	1,7%	0,77	-0,2%	0,85	4,9%	(0,95)	3,8%
1999Q2					(0,46)	3,7%			1,03	4,8%	(0,90)	5,0%
1999Q3					(0,70)	3,9%			1,41	4,8%	0,03	5,9%
1999Q4					(0,98)	5,0%			2,31	3,6%	1,29	4,6%
2000Q1					(1,27)	4,0%			0,93	3,6%	1,19	5,9%
2000Q2					(1,65)	4,9%			0,30	4,1%	1,26	4,1%
2000Q3					(1,31)	5,1%			(0,41)	2,7%	0,47	2,8%
2000Q4					(1,19)	3,6%			**(2,61)**	0,9%	(0,73)	2,8%
2001Q1					(1,28)	2,9%			(1,42)	1,7%	(0,86)	-0,5%
2001Q2									(1,35)	1,6%	(1,05)	2,5%
2001Q3									(1,22)	2,7%	(0,90)	2,5%

Source: IFS

Table 3
Events of Sudden Stop - by region
Transition countries

quarter	Croatia		Czech Republic		Estonia		Latvia		Lithuania		Slovak Republic	
	F/SD	output	F/SD	output	F/SD	output	F/SD	output	F/SD	output	F/SD	output
1995Q2			0,52	6,6%								
1995Q3			1,11	6,5%								
1995Q4			1,61	4,8%								
1996Q1			0,63	4,1%			0,17	3,2%	0,72	2,7%	1,65	6,4%
1996Q2			0,23	5,1%			1,16	1,9%	0,73	1,0%	0,75	6,6%
1996Q3			(1,11)	4,0%			1,09	5,2%	0,21	7,8%	1,99	6,6%
1996Q4	0,09	4,7%	**(2,38)**	4,0%			1,61	4,5%	(0,39)	6,7%	1,09	6,6%
1997Q1	0,96	1,8%	(1,39)	0,3%	0,94	4,4%	0,94	5,4%	0,48	4,1%	0,47	6,4%
1997Q2	1,33	4,7%	(1,36)	1,4%	1,01	10,8%	0,50	8,5%	0,77	8,4%	0,49	6,2%
1997Q3	0,41	6,3%	(0,69)	-4,2%	1,34	11,2%	0,48	9,8%	0,84	6,1%	(0,40)	6,6%
1997Q4	0,85	13,9%	(0,76)	-0,2%	1,04	12,4%	(0,73)	9,7%	0,98	10,1%	(0,76)	6,9%
1998Q1	(0,10)	6,3%	(1,13)	2,0%	0,37	10,4%	(0,03)	8,8%	0,91	8,5%	(1,41)	6,2%
1998Q2	(0,55)	5,5%	(0,73)	0,3%	1,02	6,8%	(0,25)	6,4%	0,48	10,0%	0,27	6,1%
1998Q3	(0,36)	4,0%	(0,94)	-2,9%	(0,54)	2,5%	(0,47)	3,9%	1,60	4,1%	(0,66)	5,0%
1998Q4	**(2,08)**	-4,7%	0,34	-3,4%	(1,53)	-0,4%	0,58	0,3%	1,06	-0,9%	(0,77)	0,5%
1999Q1	**(2,03)**	-1,5%			(1,45)	-1,9%	0,30	1,9%	0,23	-1,6%	(0,35)	9,4%
1999Q2	(1,88)	-2,4%			**(2,84)**	-1,5%	0,41	2,0%	0,26	-2,0%	**(2,58)**	10,8%
1999Q3	(1,47)	-1,1%			**(2,05)**	-1,1%	0,07	2,8%	**(2,47)**	-6,6%	(1,02)	8,3%
1999Q4					(0,76)	1,9%	(0,09)	4,7%	(1,98)	-4,8%	0,11	9,0%
2000Q1					(0,60)	6,4%	(0,55)	6,0%	(1,11)	5,5%	0,41	1,2%

Source IFS

Figure 1

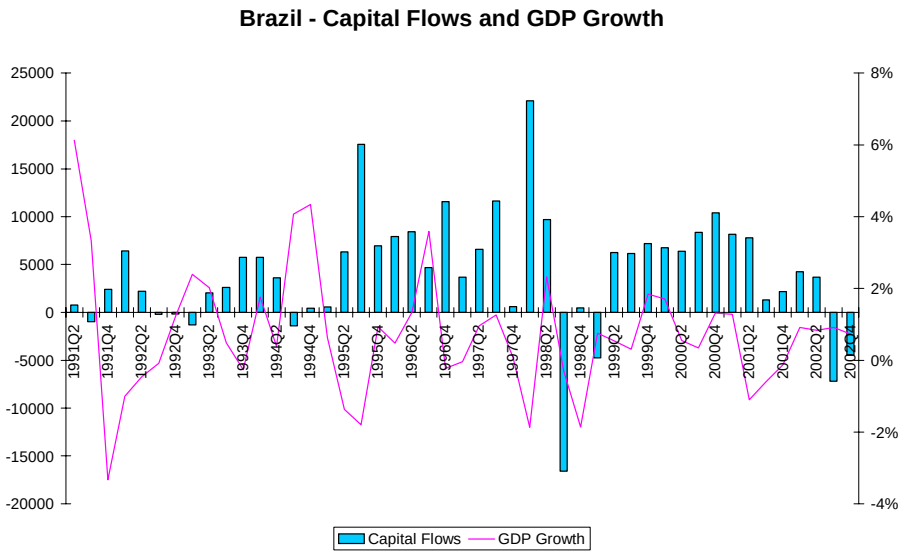

Figure 2

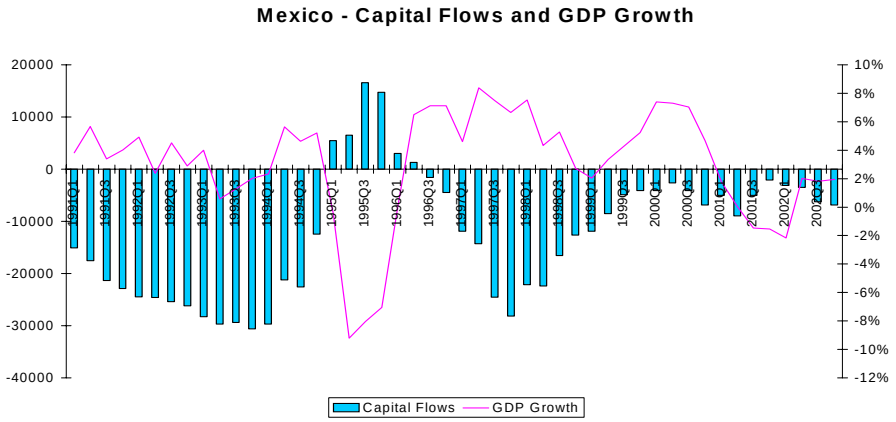

Figure 3

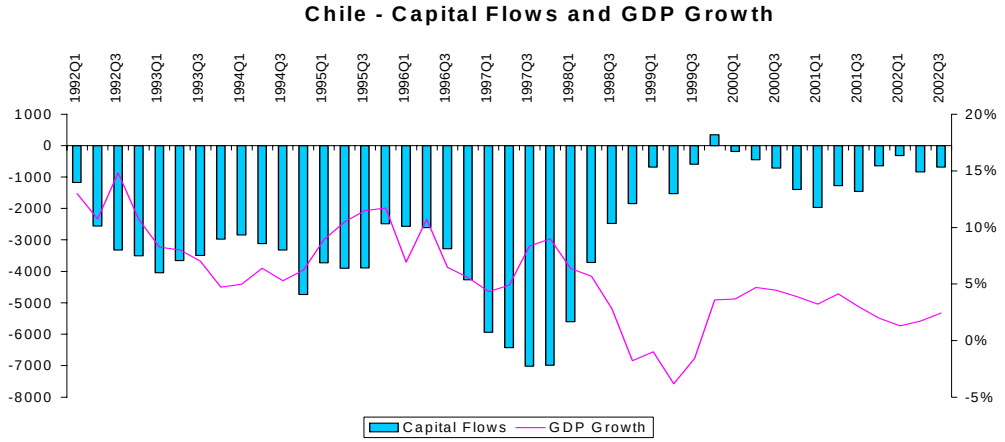

Figure 4

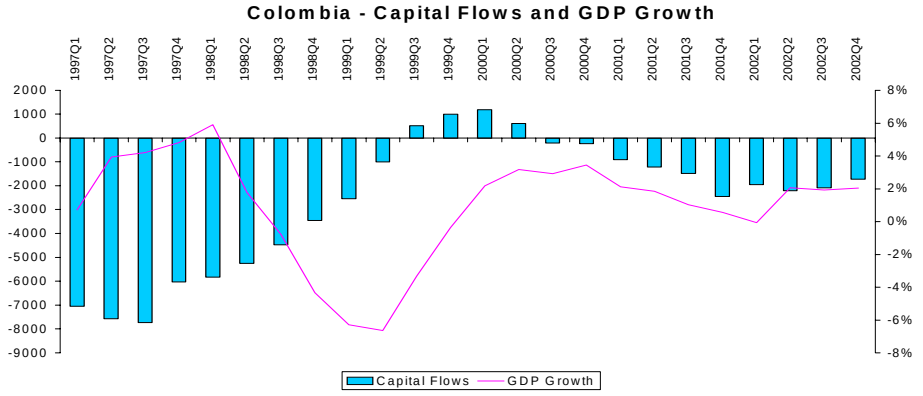

Figure 5

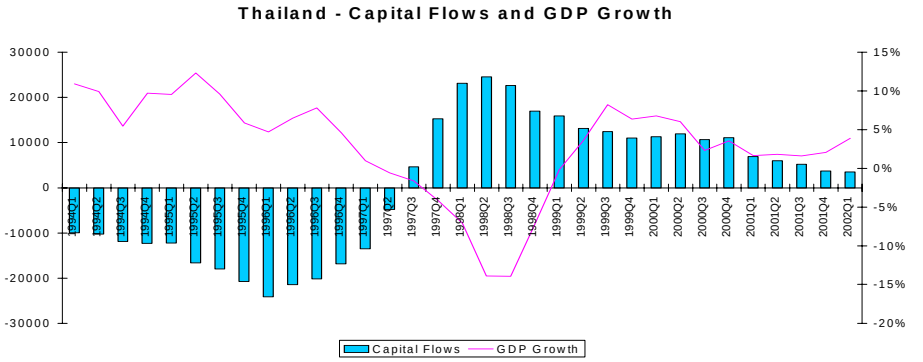

Figure 6

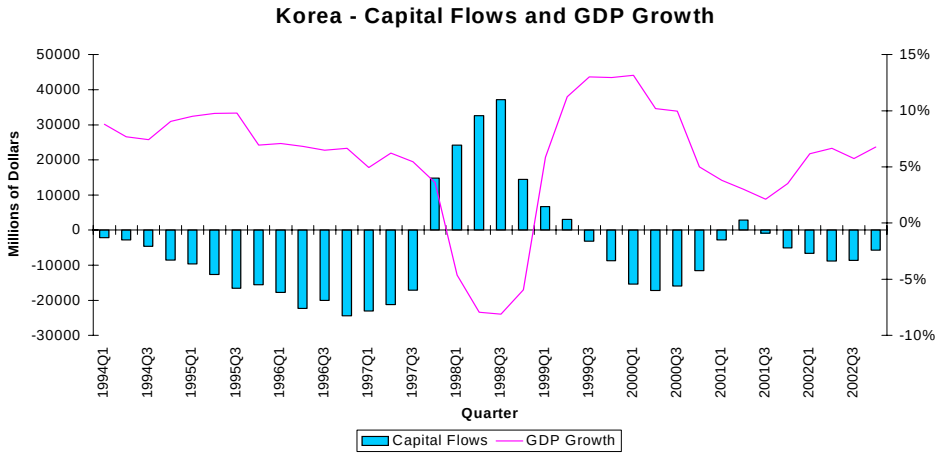

Figure 7

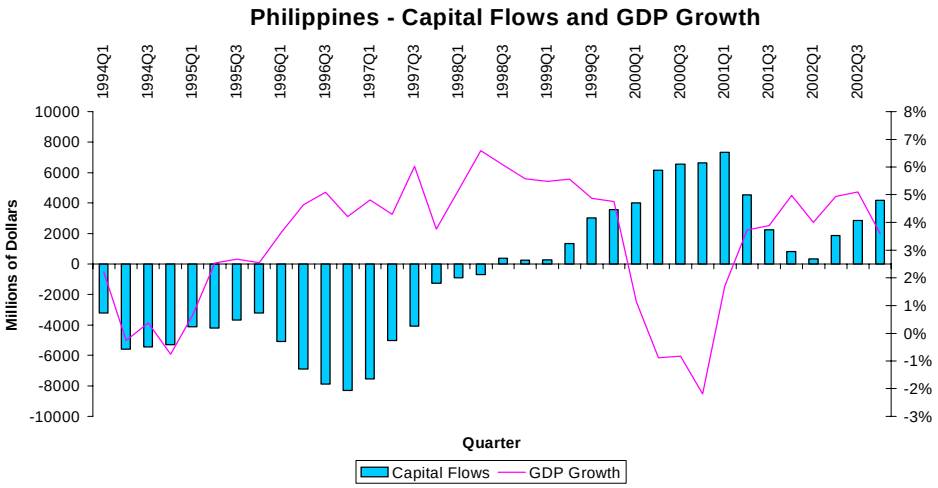

Figure 8

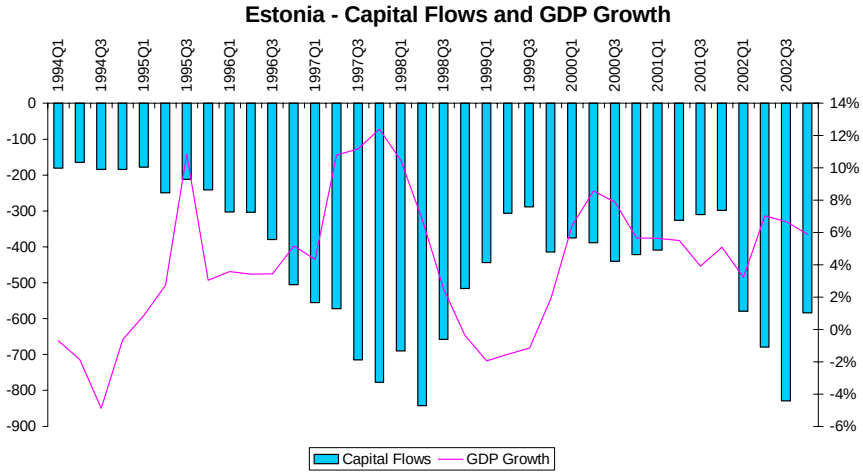

Figure 9

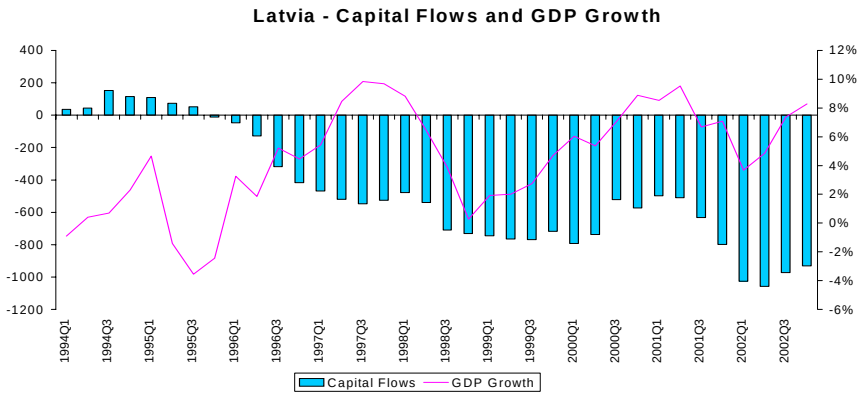

Figure 10

Lithuania - Capital Flows and GDP Growth

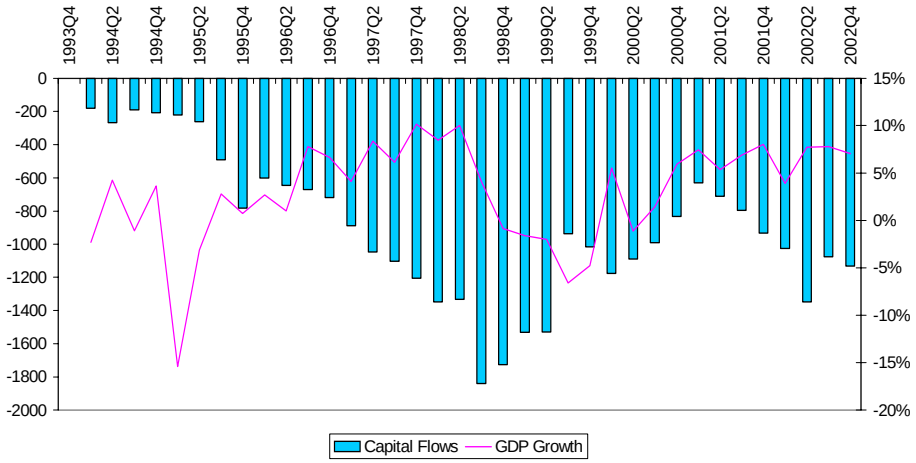

Figure 11

Thailand - Nominal Exchange rate, Inflation and F/SD

Figure 12

Chile - Nomimal Exchange Rate, Inflation and F/SD

Figure 13

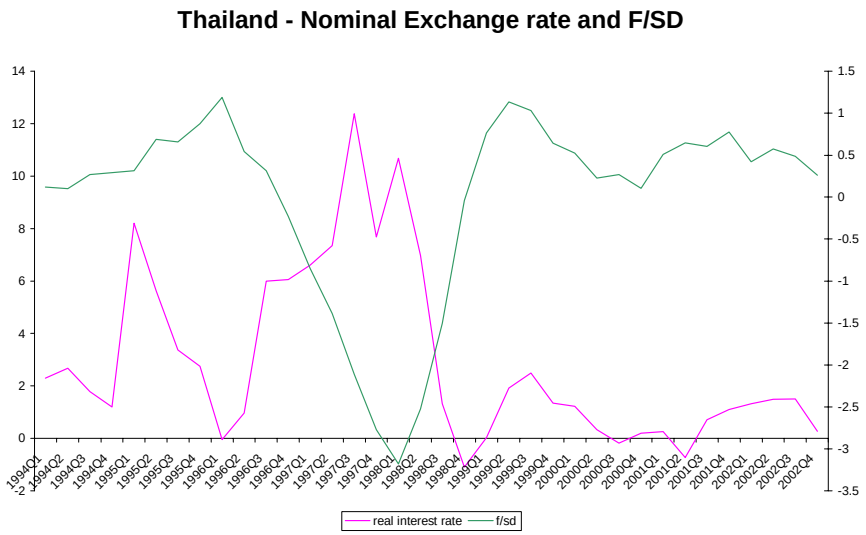

Figure 14

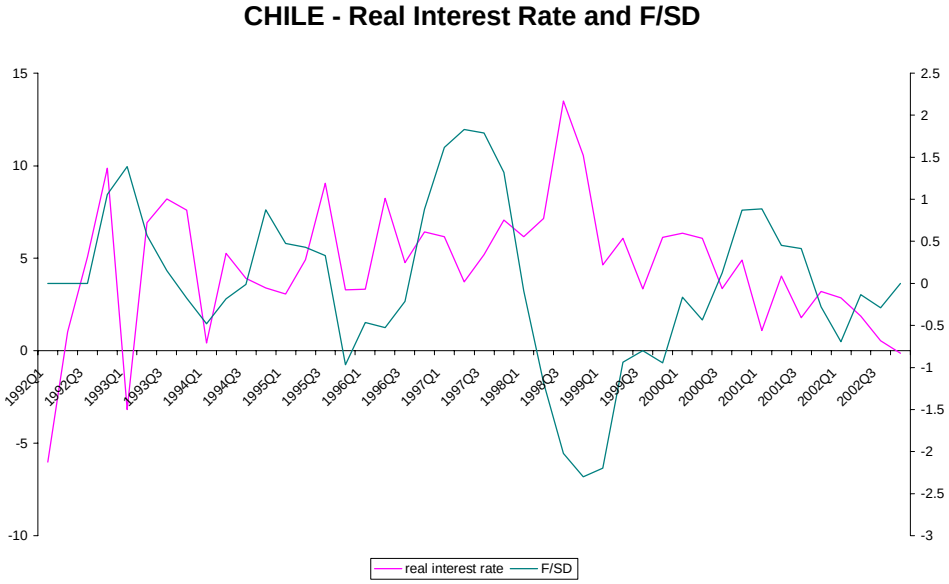

Table 4
Correlation - Capital Flow and Output gap in Latin America

	gap_arg_	gap_bra_	gap_chi_	gap_col_	gap_ecu_	gap_mex_	gap_per_
logcap_arg_	-0.816	-0.443	-0.352	-0.601	-0.433	0.344	-0.400
logcap_bra_	-0.159	-0.213	-0.346	-0.285	-0.175	0.157	-0.059
logcap_chi_	-0.134	-0.517	-0.070	-0.606	-0.691	0.503	-0.466
logcap_col_	-0.050	-0.692	-0.362	-0.676	-0.776	0.475	-0.378
logcap_ecu_	0.100	-0.099	-0.276	-0.173	-0.316	-0.047	-0.179
logcap_mex_	-0.384	0.270	0.020	0.082	0.077	-0.059	0.129
logcap_per_	-0.074	-0.710	-0.398	-0.612	-0.594	0.655	-0.400

Table 5
Granger Causality Tests - Capital Flows and Output gap in Latin America

Null Hypothesis:	Obs	F statistic	p value
logcap_arg_ does not Granger Cause gap_arg_	38	5.35338	0.00969
gap_arg_ does not Granger Cause logcap_arg_		1.53431	0.23059
logcap_bra_ does not Granger Cause gap_bra_	46	2.32023	0.11102
gap_bra_ does not Granger Cause logcap_bra_		4.14903	0.02286
logcap_chi_ does not Granger Cause gap_chi_	46	3.90711	0.02798
gap_chi_ does not Granger Cause logcap_chi_		1.03838	0.36315
logcap_col_ does not Granger Cause gap_col_	26	5.22453	0.0144
gap_col_ does not Granger Cause logcap_col_		1.7551	0.19732
logcap_ecu_ does not Granger Cause gap_ecu_	36	0.92592	0.40685
gap_ecu_ does not Granger Cause logcap_ecu_		1.64366	0.20967
logcap_mex_ does not Granger Cause gap_mex_	46	8.38651	0.00088
gap_mex_ does not Granger Cause logcap_mex_		0.34554	0.70988
logcap_per_ does not Granger Cause gap_per_	46	2.88341	0.06735
gap_per_ does not Granger Cause logcap_per_		0.87375	0.42501

Table 6
Correlation - Capital Flow and Output gap in Asia

	gap_ind_	gap_kor_	gap_phi_	gap_tha_
logcap_ind_	-0.663	-0.158	-0.292	-0.583
logcap_kor_	0.138	-0.071	0.332	-0.0031
logcap_phi_	-0.541	0.380	-0.186	-0.335
logcap_tha_	0.276	-0.209	0.200	0.090

Table 7
Granger Causality Tests - Capital Flows and Output gap in Asia

Null Hypothesis:	Obs	F statistic	p value
logcap_ind_ does not Granger Cause gap_ind_	18	9.138	0.0033
gap_ind_ does not Granger Cause logcap_ind_		0.515	0.609
logcap_kor_ does not Granger Cause gap_kor_	46	10.745	0.00018
gap_kor_ does not Granger Cause logcap_kor_		0.526	0.595
logcap_phi_ does not Granger Cause gap_phi_	46	2.383	0.105
gap_phi_ does not Granger Cause logcap_phi_		1.447	0.247
logcap_tha_ does not Granger Cause gap_tha_	38	15.664	0.000016
gap_tha_ does not Granger Cause logcap_tha_		0.132	0.877

Table 8
Correlation - Capital Flow and Output gap in Europe

	gap_cro_	gap_cze_	gap_est_	gap_hun_	gap_lat_	gap_lit_	gap_slo_
logcap_cro_	0.090	-0.178	-0.525	-0.246	-0.010	0.206	0.106
logcap_cze_	0.379	-0.200	0.387	-0.089	0.483	0.086	0.537
logcap_est_	0.036	0.161	-0.484	-0.054	0.070	-0.018	0.191
logcap_hun_	0.473	0.118	0.034	-0.218	0.203	0.167	0.433
logcap_lat_	0.349	0.493	-0.411	-0.160	-0.023	-0.019	0.134
logcap_lit_	-0.149	0.313	-0.332	-0.166	0.045	-0.387	-0.090
logcap_slv_	0.171	-0.113	-0.287	-0.140	-0.016	0.140	0.018

Table 9
Granger Causality Tests - Capital Flows and Output gap in Europe

Null Hypothesis:	Obs	F statistic	p value
logcap_cro_ does not Granger Cause gap_cro_	38	5.021	0.012
gap_cro_ does not Granger Cause logcap_cro_		1.831	0.176
logcap_cze_ does not Granger Cause gap_cze_	34	0.160	0.853
gap_cze_ does not Granger Cause logcap_cze_		0.835	0.444
logcap_est_ does not Granger Cause gap_est_	38	8.105	0.0014
gap_est_ does not Granger Cause logcap_est_		1.096	0.346
logcap_hun_ does not Granger Cause gap_hun_	30	0.072	0.931
gap_hun_ does not Granger Cause logcap_hun_		0.029	0.972
logcap_lat_ does not Granger Cause gap_lat_	38	9.315	0.00062
gap_lat_ does not Granger Cause logcap_lat_		2.820	0.074
logcap_lit_ does not Granger Cause gap_lit_	38	0.587	0.562
gap_lit_ does not Granger Cause logcap_lit_		2.105	0.138
logcap_slo_ does not Granger Cause gap_slo_	30	4.522	0.021
gap_slo_ does not Granger Cause logcap_slo_		0.872	0.431

Table 10
Correlation - F/SD and real interest rate in Latin American

	fsd_arg_	fsd_bra_	fsd_chi_	fsd_col_	fsd_ecu_	fsd_mex_	fsd_per
realint_arg_	-0.761	-0.216	-0.011	0.323	0.563	-0.014	0.051
realint_bra_	0.222	-0.084	-0.290	-0.309	0.158	0.329	-0.526
realint_chi_	0.591	0.076	-0.334	-0.423	0.055	-0.058	-0.188
realint_col_	0.545	-0.017	-0.543	-0.443	0.214	0.146	-0.567
realint_ecu_	0.285	0.0093	0.054	0.339	0.423	-0.050	0.191
realint_mex_	-0.090	-0.180	-0.054	-0.046	-0.138	-0.499	0.161
realint_per_	0.074	-0.388	-0.376	-0.760	-0.223	-0.026	-0.617

Table 11
Correlation - F/SD and real interest rate in Asia

	fsd_ind_	fsd_kor_	fsd_phi_	Fsd_tha_
realint_ind_	-0.335	-0.313	-0.377	-0.671
realint_kor_	-0.242	-0.271	-0.167	-0.606
realint_phi_	-0.209	-0.196	-0.325	-0.538
realint_tha_	-0.273	-0.322	-0.135	-0.712

Table 12
Correlation - F/SD and real interest rate in Eurepe

	fsd_cro_	fsd_cze_	fsd_est_	fsd_hun_	fsd_lat_	fsd_lit_	fsd_slo_
realint_cro_	0.547	0.188	-0.053	0.583	0.149	-0.027	-0.402
realint_cze_	-0.099	0.757	0.704	-0.044	-0.015	0.213	0.214
realint_est_	0.014	0.258	0.175	0.517	-0.343	-0.237	-0.057
realint_hun_	0.457	0.791	0.665	-0.461	0.746	0.702	0.566
realint_lat_	-0.341	-0.302	-0.257	-0.427	-0.041	-0.238	0.321
realint_lit_	-0.579	0.065	0.154	0.129	-0.628	-0.553	0.227
realint_slo_	0.039	0.538	0.609	-0.870	0.645	0.741	0.520

Table 13
Granger Causality Tests - *fsd* and Real Interest rate in Latin America

Null Hypothesis:	Obs	F statistic	p value
realint_arg_ does not Granger Cause fsd_arg_	41	1.736	0.191
fsd_arg_ does not Granger Cause realint_arg_		2.571	0.090
realint_bra_ does not Granger Cause fsd_bra_	42	0.224	0.800
fsd_bra_ does not Granger Cause realint_bra_		0.302	0.741
realint_chi_ does not Granger Cause fsd_chi_	38	0.745	0.483
fsd_chi_ does not Granger Cause realint_chi_		1.087	0.349
realint_col_ does not Granger Cause fsd_col_	30	1.604	0.221
fsd_col_ does not Granger Cause realint_col_		0.015	0.985
realint_ecu_ does not Granger Cause fsd_ecu_	31	3.086	0.063
fsd_ecu_ does not Granger Cause realint_ecu_		0.012	0.988
realint_mex_ does not Granger Cause fsd_mex_	42	8.516	0.00091
fsd_mex_ does not Granger Cause realint_mex_		2.722	0.079
realint_per_ does not Granger Cause fsd_per_	35	0.408	0.668

fsd_per_ does not Granger Cause realint_per_		0.404	0.671

Table 14
Granger Causality Tests - *fsd* and Real Interest rate in Asia

Null Hypothesis:	Obs	F statistic	p value
realint_ind_ does not Granger Cause fsd_ind_	42	18.616	0.0000025
fsd_ind_ does not Granger Cause realint_ind_		6.337	0.0043
realint_kor_ does not Granger Cause fsd_kor_	42	2.481	0.098
fsd_kor_ does not Granger Cause realint_kor_		0.839	0.440
realint_phi_ does not Granger Cause fsd_phi_	41	0.992	0.381
fsd_phi_ does not Granger Cause realint_phi_		2.189	0.127
realint_tha_ does not Granger Cause fsd_tha_	34	1.330	0.280
fsd_tha_ does not Granger Cause realint_tha_		3.245	0.054

Table 15
Granger Causality Tests - *fsd* and Real Interest rate in Europe

Null Hypothesis:	Obs	F statistic	p value
realint_cro_ does not Granger Cause fsd_cro_	31	0.104	0.901
fsd_cro_ does not Granger Cause realint_cro_		0.127	0.881
realint_cze_ does not Granger Cause fsd_cze_	30	0.757	0.479
fsd_cze_ does not Granger Cause realint_cze_		3.985	0.031
realint_est_ does not Granger Cause fsd_est_	30	0.577	0.569
fsd_est_ does not Granger Cause realint_est_		1.815	0.184
realint_hun_ does not Granger Cause fsd_hun_	34	0.669	0.520
fsd_hun_ does not Granger Cause realint_hun_		1.516	0.237
realint_lat_ does not Granger Cause fsd_lat_	31	0.132	0.877
fsd_lat_ does not Granger Cause realint_lat_		6.495	0.0052
realint_lit_ does not Granger Cause fsd_lit_	31	1.220	0.312
fsd_lit_ does not Granger Cause realint_lit_		3.375	0.050
realint_slo_ does not Granger Cause fsd_slo_	10	3.071	0.135
fsd_slo_ does not Granger Cause realint_slo_		2.525	0.175

Table 16

Dependent Variable: GAP_?
Method: Seemingly Unrelated Regression
Sample: 1992:2 2002:4
Included observations: 43
Number of cross-sections used: 18
Total panel (unbalanced) observations: 618

gap_?	Coefficients	Standard deviation	t statistic	p value
gap_?(-1)	0.611	0.030	20.577	0.000
log(exp_?(-1))	0.030	0.0050	6.015	0.000
log(1+exc_?(-1))	-0.037	0.0042	-8.776	0.000
dlogcaplatam_?(-2)	0.00025	0.00012	2.143	0.033
dlogcapasia_?(-1)	0.00041	0.00021	1.998	0.046
dlogcapeuro_?(-1)	0.00015	0.00014	1.068	0.286
logcap_?(-1)	-0.036	0.0057	-6.331	0.000
@seas(1)	-0.0082	0.0028	-2.878	0.0041
@seas(2)	-0.0053	0.0028	-1.879	0.061
@seas(3)	-0.025	0.0028	-9.179	0.000
Fixed effects				
arg_--c	0.150			
bra_--c	0.117			
chi_--c	0.366			
col_--c	0.405			
cro_--c	0.245			
cze_--c	0.243			
ecu_--c	0.489			
est_--c	0.297			
hun_--c	0.323			
ind_--c	0.374			
kor_--c	0.338			
lat_--c	0.216			
lit_--c	0.234			
mex_--c	0.153			
per_--c	0.227			
phi_--c	0.267			
slo_--c	0.291			
tha_--c	0.233			
R^2	0.590			
Adjusted R^2	0.571			

Table 17

Dependent Variable: DINF_?
Method: Seemingly Unrelated Regression
Sample: 1992:2 2002:4
Included observations: 43
Number of cross-sections used: 18
Total panel (unbalanced) observations: 611

dinf_?	Coefficients	Standard deviation	t statistic	p value
dinf_?(-1)	0.617	0.024	25.225	0.000
gap_?(-1)	0.00042	0.0069	0.061	0.951
d(log(1+exclatam_?()))	0.052	0.012	4.313	0.000
d(log(1+excasia_?()))	0.047	0.0083	5.672	0.000
d(log(1+exceuro_?()))	0.011	0.020	0.536	0.592
dlogcaplatam_?(-2)	-0.00014	0.000070	-2.030	0.043
dlogcapasia_?(-1)	-0.000097	0.000069	-1.392	0.165
logcap_?(-1)	0.0074	0.0025	2.974	0.0031
@seas(1)	0.011	0.0017	6.766	0.000
@seas(2)	-0.0021	0.0017	-1.239	0.216
@seas(3)	-0.0060	0.0016	-3.662	0.0003
Fixed effects				
arg_--c	-0.072			
bra_--c	-0.067			
chi_--c	-0.070			
col_--c	-0.068			
cro_--c	-0.072			
cze_--c	-0.070			
ecu_--c	-0.050			
est_--c	-0.068			
hun_--c	-0.065			
ind_--c	-0.061			
kor_--c	-0.071			
lat_--c	-0.069			
lit_--c	-0.069			
mex_--c	-0.062			
per_--c	-0.069			
phi_--c	-0.070			
slo_--c	-0.067			
tha_--c	-0.073			
R^2	0.644			
Adjusted R^2	0.626			

Table 18

Dependent Variable: (LOG(EXC_?()))
Method: Seemingly Unrelated Regression
Sample: 1991:4 2002:4
Included observations: 45
Number of cross-sections used: 18
Total panel (unbalanced) observations: 625

(log(exc_?()))	Coefficients	Standard deviation	t statistic	p value
d(log(exc_?(-1)))	0.404	0.059	6.74	0.000
realint_?(-1)	-0.0018	0.00028	-6.30	0.000
(logcap_?(-1))	0.207	0.0412	5.05	0.000
dlogcapeuro_?	-0.0012	0.00019	-6.00	0.000
dlogcapasia_?	-0.0040	0.00071	-5.72	0.000
dlogcaplatam_?	-0.0013	0.00078	-1.68	0.092
fedfunds	-0.0239	0.0024	-12.22	0.000
Fixed effects				
arg_--c	-1.53			
bra_--c	-1.57			
chi_--c	4.20			
col_--c	5.78			
cro_--c	0.27			
cze_--c	1.84			
ecu_--c	7.39			
est_--c	1.00			
hun_--c	3.65			
ind_--c	6.74			
kor_--c	5.28			
lat_--c	-2.17			
lit_--c	-0.26			
mex_--c	0.30			
per_--c	-0.60			
phi_--c	1.89			
slo_--c	2.20			
tha_--c	1.89			
R^2	0.987			
Adjusted R^2	0.987			

Table 19

Dependent Variable: realint_?/100
Method: Seemingly Unrelated Regression
Sample: 1994:2 2002:4
Included observations: 35
Number of cross-sections used: 18
Total panel (unbalanced) observations: 554

realint_?/100	Coefficients	Standard deviation	t statistic	p value
(logcap_?(-1))	0.025	0.0084	2.938	0.0034
(dinf_?(-1))	-0.535	0.051	-10.403	0.000
(log(exc_?(-1)))	-0.070	0.0065	-10.852	0.000
dlogcapasia_?	-0.00055	0.00015	-3.728	0.00020
dlogcaplatam_?	-0.00056	0.00016	-3.390	0.00080
gapasia_?(-1)	0.059	0.022	2.718	0.0068
gapeuro_?(-1)	0.114	0.026	4.433	0.000
realint_?(-1)/100	0.573	0.018	32.173	0.000
embi(-1)	0.000069	0.000035	1.980	0.048
Fixed effects				
arg_--c	-0.182			
bra_--c	-0.151			
chi_--c	0.202			
col_--c	0.316			
cro_--c	-0.068			
cze_--c	0.027			
ecu_--c	0.432			
est_--c	-0.058			
hun_--c	0.164			
ind_--c	0.441			
kor_--c	0.278			
lat_--c	-0.267			
lit_--c	-0.120			
mex_--c	-0.040			
per_--c	-0.072			
phi_--c	0.040			
slo_--c	0.039			
tha_--c	0.026			
R-squared	0.771			
Adjusted R-squared	0.760			

Table 20

Dependent Variable: LOGCAP_?
Method: Seemingly Unrelated Regression
Sample: 1994:2 2002:4
Included observations: 35
Number of cross-sections used: 18
Total panel (unbalanced) observations: 564

logcap_?	Coefficients	Standard deviation	t statistic	p value
(logcap_?(-1))	0.301	0.039	7.53	0.000
dinf_?(-1)	0.209	0.032	6.53	0.000
(log(exc_?(-1)))	0.013	0.0054	2.39	0.017
gaplatam_?(-1)	-0.21	0.044	-4.85	0.000
gapasia_?(-1)	-0.25	0.083	-3.02	0.002
gapeuro_?(-1)	-0.022	0.011	-2.01	0.044
Realint_?(-1)	0.041	0.006	-1.262	0.208
(log(exp_?()))	-0.00093	0.0050	6.96	0.00
embi(-1)	0.000228	0.000037	6.11	0.000
Fixed effects				
arg_--c	7.219			
bra_--c	7.030			
chi_--c	7.207			
col_--c	7.174			
cro_--c	7.228			
cze_--c	7.194			
ecu_--c	7.184			
est_--c	7.229			
hun_--c	7.192			
ind_--c	7.147			
kor_--c	7.161			
lat_--c	7.251			
lit_--c	7.235			
mex_--c	7.159			
per_--c	7.231			
phi_--c	7.233			
slo_--c	7.208			
tha_--c	7.236			
R^2	0.268			
Adjusted R^2	0.234			

Table 21 - Gap Latin America

Δgap	Short run coefficients♦	Standard deviation
Δgap-1	-0.77***	0,041
Logcap	-0.0617***	0,013
Δlogcap	-0,0027	0,008
Lexp	-0,029**	0,013
Δlexp	0,151***	0,013
Δdlogcap	0,0014***	0,0004
ΔLrealint	-0,017***	0,029
gapusa	2.178***	0,29
Const	-0,016***	0,0042
Trim3	0,442	0,339
p-val Sargan	0,0	
z- auto, p_value	-2.21	0,027
nº count, obs.	7	134

** / *** significant at 5 / 1%

Table 22 - Gap Asia

Δgap	Short run coefficients ♦	Standard deviation
Δgap-1	-0.79***	0,008
Lrealint	-0.5917	2.62
Δlrealint	0,19*	2,36
Lexp	1,65**	0,84
Δlexp	1,209*	0,66
Δdlogcap-1	0,05**	0,024
Const	-0,016***	0,0042
Trim3	0,442	0,339
p-val Sargan	0,994	
z- auto, p_value	-	-
nº count, obs.	5	41

** / *** significant at 5 / 1%

Table 23 - Gap Transition Countries

Δgap	Short run coefficients ♦	Standard deviation
Δgap-1	-0. 0459	0.052
Logcap	-18.219	12.305
Δlogcap	39.613***	12.224
Lexp	12.243*	7.62
Δlexp	-6.05	6.37
Δdlogcap	-.033	0.185
ΔLrealint	-10.04*	8.44
Const	-0.226	0.414
Trim3	1.377	1.079
p-val Sargan	0,98	
z- auto, p_value	--8.63	0,000
nº count, obs.	9	153

** / *** significant at 5 / 1%

Table 24 - Inflation Latin America

Δinf	Short run coefficients ♦	Standard deviation
Δinf-1	0.840***	0.072
Logcap	0.020	0.0369
Δlogcap	0,029	0.019
Δgap	-0.008	0.16
Δlexp	-0.218***	0.043
Δlexc	0.105***	0,043
Const	0,005*	0,003
Trim3	0.003	0.008
p-val Sargan	0,0	
z- auto, p_value	-4.31	0,00
nº count, obs.	7	142

** / *** significant at 5 / 1%

Table 25- Inflation Asia

Δinf	Short run coefficients ♦	Standard deviation
Δinf-1	0.275**	0.11
Logcap	-0.0021	0.0103
Δlogcap	0,028*	0.016
Δgap	0.004**	0.0002
Δlexp	-0.027	.0192
Δlexc	0.005	0,014
Const	-0,00002	0,0014
Trim3	0.0041*	0.002
p-val Sargan	0,00	
z- auto, p_value	-2.77	0,006
nº count, obs.	5	95

** / *** significant at 5 / 1%

Table 26 - Inflation Transition Countries

Δinf	Short run coefficients ♦	Standard deviation
Δinf-1	-0.169***	0.055
Δlexp	-0.0714***	0.023
Δgap	0.00165***	0.0001
Δlexc	-0.22***	0,025
Const	0,005*	0,003
Trim3	0.003	0.008
p-val Sargan	0,0	
z- auto, p_value	-3.94	0,00
nº count, obs.	9	169

** / *** significant at 5 / 1%

Table 27 - Exchange Rate Latin America

Δlexc	Short run coefficients ♦	Standard deviation
Δlexc-1	0. 495***	0,043
Lrealint	0,045***	0,014
Δlrealint	-0.027*	0.015
Lexp	0,184**	0,040
Δlexp	-0,269***	0,024
Δlogcap	0,06***	0,015
Δfedfunds	0.031***	0,009
Const	0,031**	0,002
Trim3	0,02	0,008
p-val Sargan	0,0	
z- auto, p_value	-1.61	0,108
nº count, obs.	7	135

** / *** significant at 5 / 1%

Table 28 - Exchange Rate Asia

Δlexc	Short run coefficients ♦	Standard deviation
Δlexc-1	0. 159**	0,083
Lrealint	0,48*	0,3
Δlrealint	-0.08	0.29
Lexp	0,394***	0,096
Δlexp	- 0435***	0,085
Δlogcap	0,55***	0,08
Δfedfunds	-0.031**	0,024
Const	0,034**	0,005
Trim3	0,023	0,016
p-val Sargan	0,01	
z- auto, p_value	-0.19	0,85
nº count, obs.	5	95

** / *** significant at 5 / 1%

Table 29 - Exchange Rate Transition Countries

Δlexc	Short run coefficients ♦	Standard deviation
Δlexc-1	0.705***	0,029
Lrealint	0.168**	0,082
Δlrealint	-0.101**	0.004
Lexp	0.236***	0,032
Δlexp	-0, 131***	0,037
Δlogcap	-0,183**	0,09
Δfedfunds	-0.011	0,007
Const	0,0014	0,002
Trim3	0,011*	0,006
p-val Sargan	0,0	
z- auto, p_value	-5.72	0,108
nº count, obs.	9	157

** / *** significant at 5 / 1%

Table 30 - Capital Flow Asia

Δlogcap	Short run coefficients ♦	Standard deviation
Δlogcap-1	0. 038**	0.102
Δlrealint	0.62*	0.39
Lexp	-0.857***	0.15
Δlexp	- 0.701***	0.10
Δgap	0.014***	0.0014
Δfedfunds	0.074**	0,024
Const	0.113**	0, 008
Trim3	0.003	0,016
p-val Sargan	0,00	
z- auto, p_value	-2.02	0,04
nº count, obs.	5	82

** / *** significant at 5 / 1%

Table 31 - Capital Flow Rate Latin America

Δlogcap	Short run coefficients ♦	Standard deviation
Δlogcap-1	0. 168**	0.058
Δlrealint	0.070*	0.043
Lexp	0.299	0.226
Δlexp	0.067	0.129
Δgap	-0.026	0.35
Δfedfunds	-0.038**	0,027
Const	0.028**	0, 023
Trim3	0.003	0,016
p-val Sargan	0,00	
z- auto, p_value	-7.84	0,00
nº count, obs.	7	134

** / *** significant at 5 / 1%

Table 32 - Capital Flow Transition Countries

Δlogcap	Short run coefficients ♦	Standard deviation
Δlogcap-1	0. 114**	0.107
Δlrealint	-0.218***	0.050
Lexp	-0.093	0. 066
Δlexp	0.072**	0. 039
Δgap	-0.004***	0.0003
Δfedfunds	-0.010**	0.007
Const	-0.004**	0.0023
Trim3	-0.003	0.006
p-val Sargan	0,00	
z- auto, p_value	-5.05	0,00
nº count, obs.	9	153

** / *** significant at 5 / 1%

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