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Managing large capital inflows: Taking stock of international experiences

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**Managing Large Capital Inflows:
Taking Stock of International Experiences**

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March 2008

ADB Institute Discussion Paper No. 97

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Abstract

Two waves of large capital inflows to emerging markets in the past 20 years appear to present a paradox: inflows can provide opportunities for faster growth and technology transfer, but they can also feed overheating pressures and unleash forces that push recipients into crisis. This paper examines over 90 episodes of large inflows asking whether ill-effects were common or severe, how they were or were not avoided, and what circumstances resulted in the most successful episodes. The findings point to the crucial role of counter-cyclical fiscal policy during inflow episodes. Other protective steps—particularly in the area of financial sector supervision and development—can be equally important.

JEL Classification: E44, F36, F41

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I. INTRODUCTION

Large capital flows to emerging markets are almost inevitable given the wide disparities between capital per worker in emerging and in advanced countries. When a combination of historical factors in emerging markets—for example, poor policies that have produced instability, weak institutions that have not instilled confidence in potential investors, insufficient or ineffective educational systems, and geographical remoteness in a previous age of weak global communication—has prevented the investment and technological progress needed to catch up to industrial country income levels, removing such constraints on growth should result in a re-equilibrating shift in the global allocation of capital. This is the story of the past 20 or so years—and the result has been large changes in the global allocation of capital as the world moves from an old equilibrium toward a new one. As we all know from a range of experiences—political transitions, social change, technological innovation, to name a few—shifts to new equilibria seldom happen smoothly and can have many (desirable and undesirable) side-effects. This is the broad framework in which large capital flows should be seen.

In the course of the past 20 years' experience with large capital inflows to emerging market countries, four broad *perceptions* seem to have taken shape.

- Episodes of large capital inflows carry two main risks: that they will feed overheating pressures which effectively undermine the benefits inflows should deliver and that they will end in crisis.
- There are no good macroeconomic policy solutions to the potential overheating problem. The orthodoxy is that restrictive fiscal policy is the most effective response, but it is difficult to implement.¹ Much attention, therefore, focuses on monetary policy options. Some argue that policymakers must ultimately decide between currency appreciation and higher inflation, each seen as bad for investment and exports and therefore sustainable, outward-oriented growth. Others argue that sterilized intervention can guide economies on a low-inflation, low-appreciation path.
- Large inflows tend to be driven by a sizable short-term (hot) component reflecting investor opportunism rather than considered commitments to the recipient country. This perception has produced considerable interest in controls to moderate large inflows and discourage hot money. But their effectiveness and desirability over more than short periods is subject to doubt.
- Countries experiencing inflows need strategies for protecting themselves during possible hard landings. Many countries see accumulation of large official foreign exchange reserves as one such strategy.

The immediate objective of this paper is to review the experiences of countries in several regions during the past 20 years in search of evidence on these four perceptions. The broader aim is to draw conclusion on how countries should prepare themselves for and respond to large inflows in the future.

The remainder of the paper has six sections. The first identifies the episodes of large inflows in the past 20 years: these episodes will serve as the experiences from which to

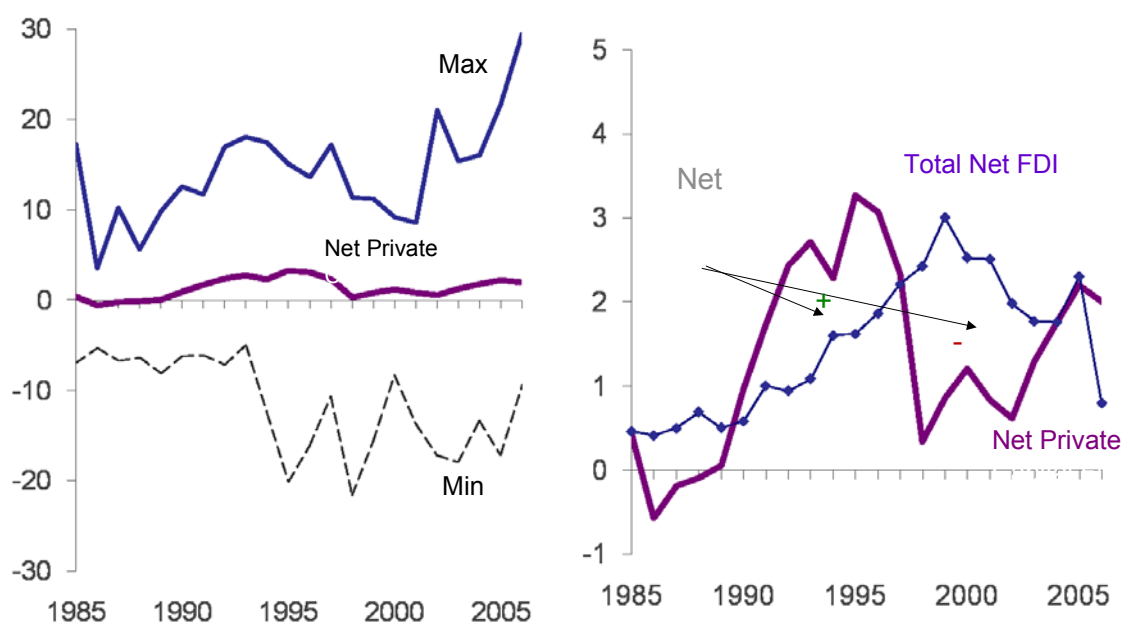
¹ See, for example, Schadler et al. (1993), Montiel (1999), Reinhart and Reinhart (1998), and IMF (2007b).

draw conclusions about the effects of and responses to large inflows. The second looks at whether unwanted developments accompanying large inflows—especially excessive real currency appreciation and inflation—have been prevalent. The third examines the main policy responses that have occurred. The fourth turns the investigation around and asks what were the macroeconomic characteristics of the most successful episodes. The fifth section looks at ways countries have attempted to prepare themselves for possible crises in the wake of inflow episodes. Conclusions are offered in a final section.

II. EPISODES OF LARGE INFLOWS

The past 20 years have seen two periods of large increases in net private capital flows into emerging market countries.^{2, 3} The first occurred during 1990-97 and, after a hiatus during 1998-2002, the second, which continues, began in about 2003 (Figure 1). A few general features of this period stand out.

Figure 1: Net Private Inflows to Emerging Markets and Components, 1985-2006
(in percent of total emerging market GDP)



Sources: IMF (WEO) and author's calculations.

- First, changes in FDI inflows tend to be gradual: FDI inflows rose steadily through the 1990s (from about ½ percent to about 3 percent of emerging market GDP) before sliding back to about 2 percent of GDP in recent years.

² Net private inflows correspond to the definition in the International Monetary Fund's (IMF) Balance of Payments database, comprising net foreign direct investment, private portfolio flows, and other private flows. Flows are considered "private" regardless of the source if the *recipient* is in the private sector.

³ The emerging market countries considered in this paper comprise 43 countries that i) are included in the World Economic Outlook classification of other emerging market and developing countries or newly industrialized Asian countries and ii) experienced at least one episode of unusually large net private capital inflows during 1987-2006 (as per the definition given in the text below).

- Second, in contrast to this relatively gentle undulation, non-FDI inflows (comprising portfolio and other flows) moved sharply. Volatile non-FDI is evident in all regions, but stands out in emerging Asia. In other words, the perception that countries experiencing large non-FDI inflows are more vulnerable to sudden stops or reversals is broadly borne out in experience.
- Third, commonality in the timing of large inflows is low across all emerging markets. The range from the maximum to the minimum inflow to individual countries in each year far exceeds the average inflow to all countries. Given the slow movements of FDI, the wide variation between maximum and minimum capital inflows for any year suggests quite significantly different behavior across countries of non-FDI inflows in any given year.

These observations point to a key question (not yet well-answered in the literature): what drives non-FDI inflows and what could make them more stable?

Regional differences in the pattern and size of net inflows indicate that countries' experiences are shaped importantly by neighborhood. The surge in inflows in the 1990s was dominated by emerging Asia and Latin America.⁴ The more recent one centers on emerging Europe and other emerging countries (Figure 2). This pattern raises the question of whether surges in inflows are more the result of regional attractions (for example, countries' adoption of common goals such as accession to the EU or a cyclical development in a major country in the region) than global influences (for example, an increased appetite for emerging market risk as a category or lower returns on investments in advanced countries). Indeed, for almost all countries, the coefficient of correlation of its inflows with inflows to its region is considerably stronger than that of its inflows with total net inflows to emerging markets. All things equal, any individual country must therefore expect that when inflows start to come to its region they will soon be arriving to it. Also, this regional commonality may also make it sensible to coordinate responses to inflows.

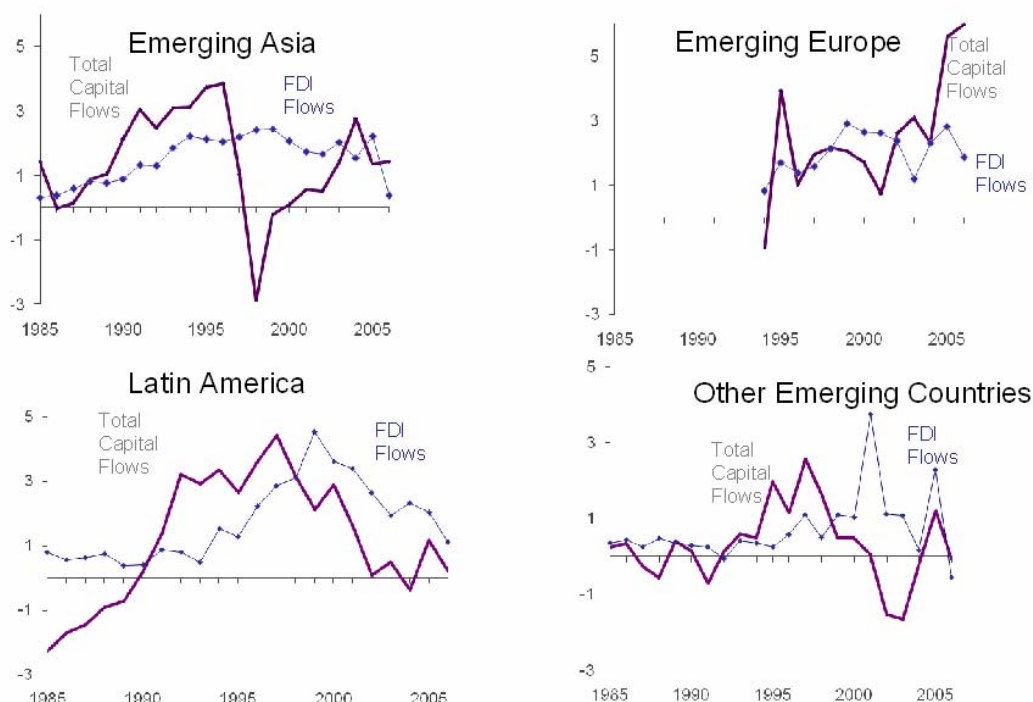
The ongoing inflow episode raises the question whether only net inflows matter or whether surges in gross inflows also matter. Net private inflows to emerging Asia, which at the mid-1990 peak were the largest (relative to GDP) of any region, have recently been well below those to emerging Europe. Gross inflows to emerging Asia, however, have been extremely high. Insofar as macroeconomic effects, in particular overheating, are mainly related to net inflows, large gross inflows alone are unlikely to arouse the same concerns.⁵ Still, it is possible that large gross flows have distributional effects, though macroeconomic problems would be much smaller than for large net inflows.⁶

⁴ This distinction is somewhat skewed by the absence of data for many emerging European countries in the first half of the 1990s. But insofar as most were undergoing a highly disruptive exit from central planning during this period, it is unlikely, especially in the early years, that net private inflows were large.

⁵ One interesting question for countries experiencing large gross inflows, but not large net inflows is whether the inflows are actually the result of *residents* investing domestically, but channeling funds through foreign investment vehicles. This could occur for reasons related to tax evasion, restrictions on residents' investment or better legal protection from vehicles for foreign investment into the country.

⁶ IMF (2007d) examines the surge in gross inflows to emerging Asia.

**Figure 2: Regional Developments in Net Private Inflows to Emerging Markets 1985-2006
(in percent of regional GDP)**

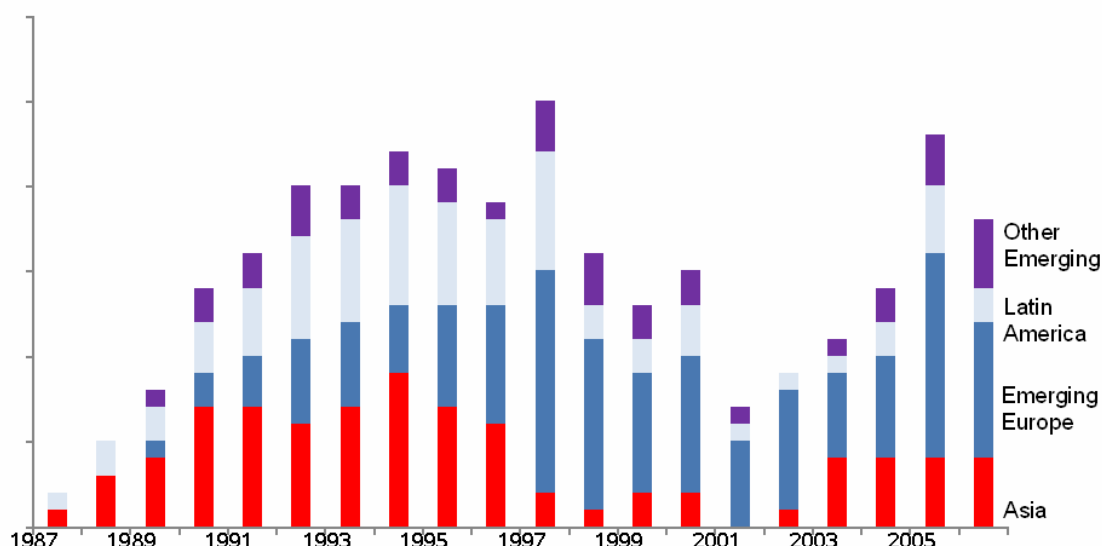


Sources: IMF (WEO, 2007), and author's calculations.

Assessments of macroeconomic issues in countries receiving large inflows should zoom in on episodes of unusually large net inflows to individual countries. The identification of such episodes in the IMF's October 2007 World Economic Outlook (WEO) serves this purpose. Net inflows in any given year must meet one of two criteria to qualify as an episode: the ratio of net inflows to GDP exceeds its trend value plus one standard deviation; or it exceeds a threshold of 75 percent of the average of the country's region. Applying this methodology produces a list of 109 episodes—some lasting only one year, but most lasting several years.⁷ Not surprisingly, developments in the number of large inflow episodes broadly match the overall average and regional distribution of net inflows described earlier in this section (Figure 3).

⁷ A list of the episodes of unusually large net private inflows is in Appendix 1. For details on the selection, see IMF (2007) Appendix 3.1.

Figure 3: Episodes of Large Net Private Inflows to Emerging Markets, 1987-2006
(number of ongoing episodes)



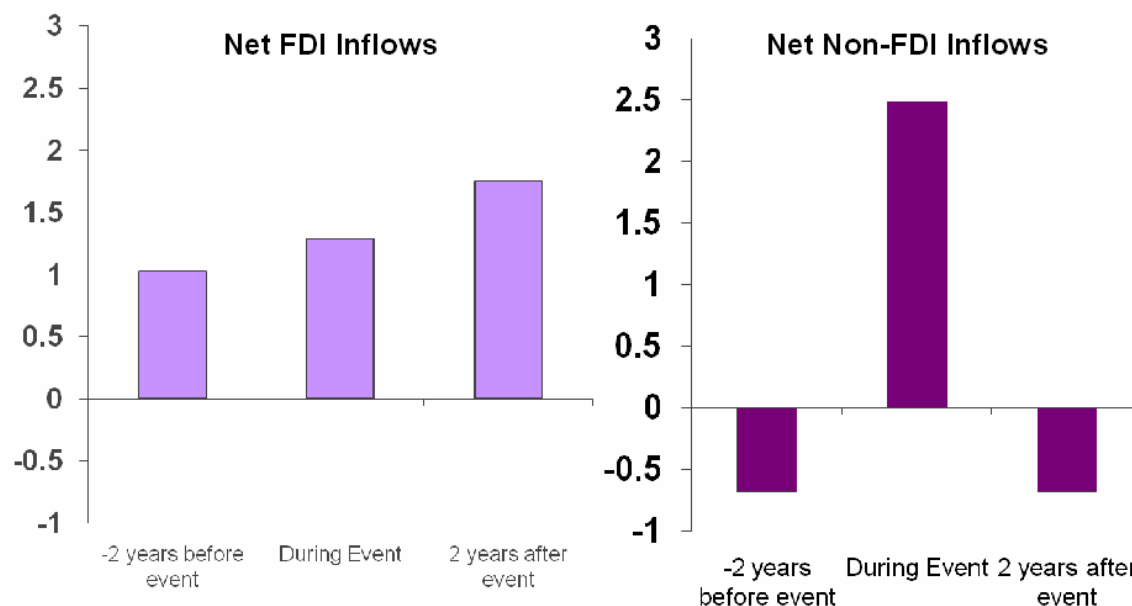
Source: IMF (WEO) and author's calculations.

How Serious are the Unwanted Effects of Large Inflows?

With much focus on macroeconomic problems associated with large inflows, it bears repeating that inflows—FDI especially but potentially also non-FDI—should be good for an economy. They shift savings from capital-rich to capital-poor countries, facilitate the transfer of technology, and allow residents in countries with strong growth potential to smooth consumption. Yet, there is much fear that episodes of large inflows are dominated by volatile “hot” money that has none of these good effects.

Fears about the potential for volatility in episodes of large inflows has some basis in fact. Unquestionably, non-FDI flows were an important influence on the pattern of surges. On average, from net outflows prior to episodes, non-FDI inflows rose sharply during episodes and then fell back to negative territory, defining the end of episodes (Figure 4). But FDI inflows also played a significant role in the episodes. In particular, FDI inflows on average rose significantly during the episode and remain more or less at the elevated level in the two years after the episode.

**Figure 4: Net FDI and Non-FDI Inflows Before, During and After Episodes
(medians for all emerging markets, in percent of GDP)**



Source: WEO (2007) and author's calculations.

These patterns underscore the importance of policy efforts to avoid overheating and ward off the threat of crisis in the aftermath of large inflow episodes. The objective in this section is to ask how large are the risks of significantly adverse effects from inflows by looking at how serious the unwanted effects of past episodes have been. There is of course a chicken and egg problem here. Should one look first at the policy response and then at the actual macroeconomic developments or look first at the outcomes and then see what policies lay behind them? I have chosen the latter approach so as to get a broad perspective on the overall experience during episodes before turning to how policies were used to manage the process. The reverse process could clearly also be justified. I start with a summary of how episodes ended—that is, whether landings were soft or hard. I then turn to the extent of the overheating pressures in terms of exchange rate appreciation and inflation. Finally, I look for signs that inflows fed excessive credit growth (a possible sign of over-leveraging or asset bubbles).

1. Crises or Hard Landings

Defining the end of inflow episodes as “soft” or “hard” is far from an exact science.

Though policymakers know when their economy is in a crisis, it is not obvious how to define a crisis empirically.⁸ Not only is the line between crises and less serious short-term setbacks blurry, but also crises that have occurred during the past 20 years have taken several different forms: crunches on funding a current account deficit (whether on the side of trade or servicing external debt); the government's inability to service its domestic and/or external debt; and major domestic bank insolvencies. Establishing a benchmark for any of these is not straightforward. It is, therefore, tempting to define a crisis in terms of a sharp drop in the rate of capital inflows.⁹ But such “abrupt-endings” are not necessarily

⁸ Kaminisky, Lizondo, and Reinhart (1998) has a taxonomy of definitions of crisis in many empirical studies.

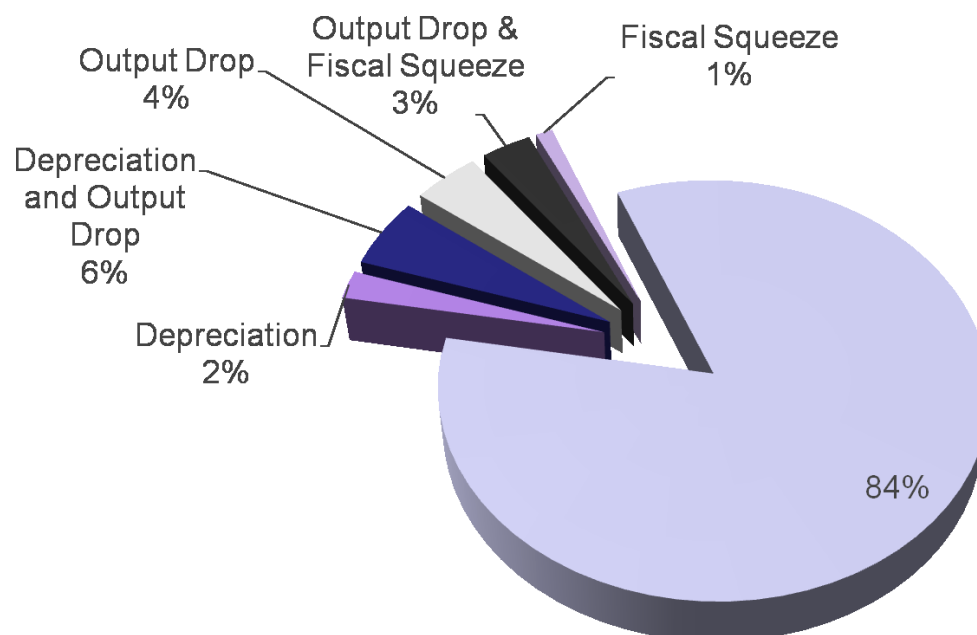
⁹ See IMF (2007b).

closely related to crises. For example if a sudden drop in inflows curtails very rapid growth of investment or consumption fed by previous large inflows, this need not be a crisis. Particularly in the kinds of circumstances underlying recent and ongoing inflow episodes—where inflows are an autonomous influence rather than the result of excessive government borrowing to finance large public deficits as in the 1970s, 80s, and even 90s—a sharp reduction in inflows may cool off an overheating situation with relatively little unwanted disruption.

From a policy perspective, it makes sense to define crises in terms of sharp changes in a key price or policy instrument, presumably under duress. A large depreciation is one such indicator—a discontinuous disruption of conditions facing producers, investors and consumers. For countries that fix and manage to defend the exchange rate, a “crisis” might be signaled by a sharp increase in interest rates (for example, in the Baltic countries’ defense of currency boards/hard peg in the 1998 Russia crisis). As for policy instruments, a clear sign of crisis is a sharp worsening of the government’s balance sheet (for example, due to absorption of debt of insolvent banks) or a sharp fiscal tightening (severe spending restraint or tax increases). More direct signs of a crisis show up in economic activity. A deceleration of GDP or domestic demand is highly likely and not necessarily unwanted in the wake of large inflows, but outright drops in output or demand signal economic distress. Empirically, setting thresholds to delineate crisis is arbitrary—I use a depreciation greater than 20 percent, a drop in real government primary expenditure relative to GDP by more than 2 percentage points or a drop in output, each within two years after the episode.

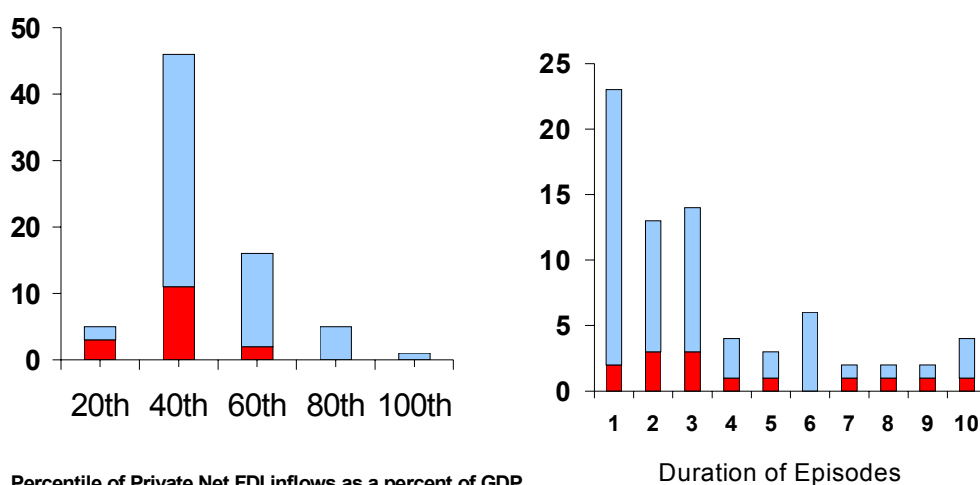
On the basis of these three metrics, about 15 percent of episodes completed by 2004 ended in crisis (Figure 5). In none were all three thresholds crossed. More than half of all crises involved a depreciation of 20 percent or greater, and of these, most also entailed an output drop. Surprisingly, the share of episodes ending in crisis was not higher for longer- duration episodes or for episodes with larger inflows (Figure 6). All regions experienced some crises, but proportionately more emerging Asia episodes had hard landings (Figure 7).

Figure 5: Episodes Ending in Crisis
(percent of total episodes ending in or before 2004)



Source: IMF (WEO) and author's calculations.

Figure 6: Episode Intensity, Duration and Crisis
(number of episodes with specified characteristics ending in or before 2004)



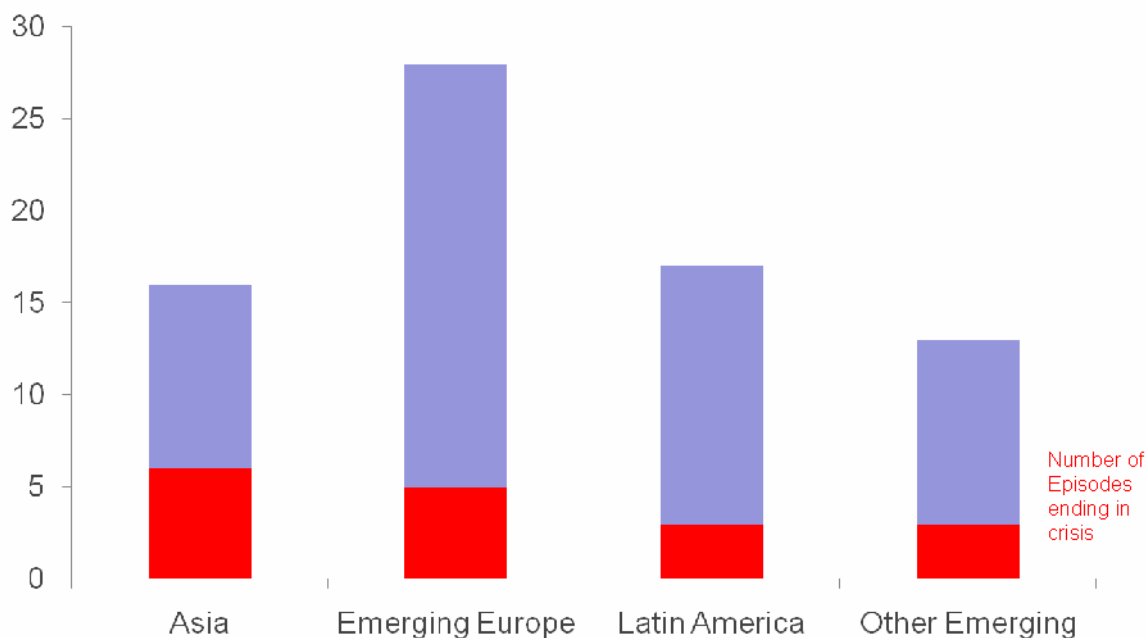
Percentile of Private Net FDI inflows as a percent of GDP

Duration of Episodes

Note: Full bar shows total number of episodes with the specified intensity or duration. Red portion shows number that ended in crisis.

Source: IMF (WEO) and author's calculations.

**Figure 7: Total Episodes and Episodes Ending in Crisis by Region
(in number of episodes)**



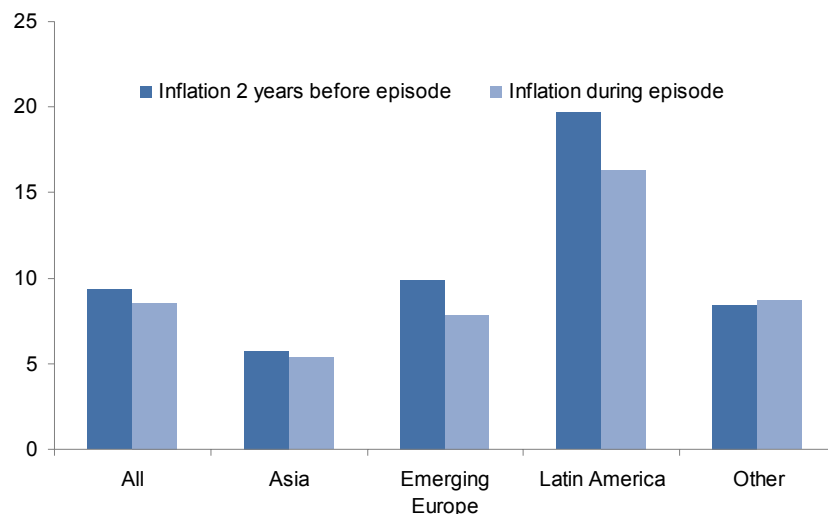
Source: WEO and author's calculations.

2. Overheating and Rapid Growth of Bank Credit to the Private Sector

Apart from the risk of a crisis, overheating during inflow episodes risks derailing growth strategies. Large inflows can provide funding to raise capital labor ratios, import technology, and boost productivity. In this process, they will unavoidably result in some real appreciation, either through nominal exchange rate appreciation or higher inflation. But when exuberance or speculative pressures from inflows result in overheating or excessive leveraging, the cost of instability could outweigh the potential benefits of inflows. Signs of such developments are rising inflation, real appreciation beyond that consistent with productivity gains, or rapid bank credit growth. How severe have such setbacks been in reality?

Looking first at inflation, the past 20 years' experience suggests that the effects on average have not been large (Figure 8). Median inflation rates fell from an annual average of 8 percent in the two years prior to inflow episodes to 7 percent during episodes. This drop clearly does not reflect the influence of inflows. Rather, it reflects the fact that surge episodes were common in major disinflations, particularly during the 1990s and particularly in Latin America (and to a lesser extent in emerging Europe). Typically, a combination of influences (falling global inflation and of domestic disinflation policies) raised market confidence in the currency and the growth potential of the economy. Flight capital returned, de-dollarization occurred (both reflected in non-FDI inflows), and interest in direct foreign investment to the country rose. Also, in some cases, high domestic interest rates as part of the disinflation program attracted (presumably hotter) capital. Making the case that inflows were inflationary in these circumstances would require a counterfactual indicating that the disinflation would have been faster in the absence of inflows.

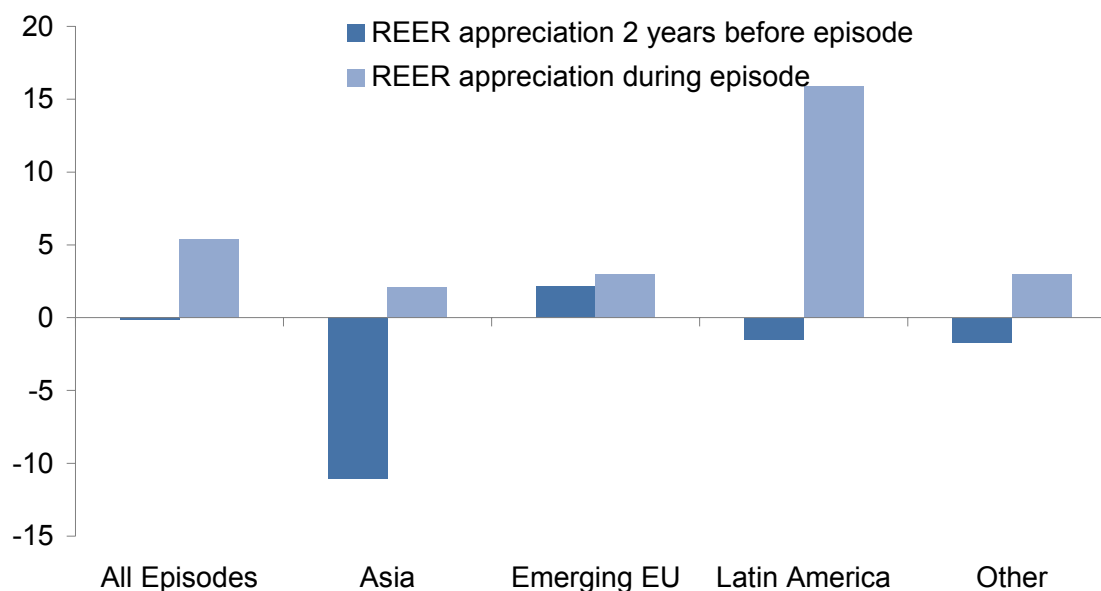
**Figure 8: Inflation During Episodes
(median annual inflation, in percent)**



Source: WEO and author's calculations

The picture on median real appreciations during episodes is not as benign as on inflation, but nor is it alarming. Two kinds of patterns are most clear. First, in Latin America—where countries were typically disinflating during the episodes—real appreciations during episodes were high (Figure 9). Inflows tended to be accompanied not by nominal appreciations, but rather by a slowing of the rate of nominal depreciation. With high, even if falling, inflation, real currency values rose. A second pattern is evident in Asia. Large real depreciations in the two years prior to episodes (many during the second half of the 1980s when de facto dollar pegs alongside a depreciating dollar produced effective depreciations) meant that episodes may have resulted in part from relatively low exchange rate valuations. But the average real appreciation in Asia during the episode was relatively moderate anyway. The median change in real exchange rates during all episodes looks well within a manageable range: the two years before episodes saw median real effective depreciations of less than 1 percent, and the episode years saw median cumulative real appreciations of about 5 percent. And, most countries in the sample were probably experiencing Balassa-Samuelson and other catch-up effects on the equilibrium real exchange rate that would make some real appreciation normal. Of course, averages hide the outliers, some of which experienced serious setbacks in competitiveness.

**Figure 9: Real Exchange Rate Developments During Episodes
(median change, in percent)**



Source: WEO and author's calculations

Inflows feeding rapid growth in bank credit to the private sector have been another serious concern. This issue has received a great deal of attention in ongoing episodes in emerging Europe, where commercial bank borrowing from abroad (typically by domestic branches or subsidiaries of foreign banks from parent banks) has been unusually large in both absolute terms and as a share of total inflows. Rapid credit growth was also a prominent characteristic of the episodes in Asia, but there is likely, however, to be a difference. Throughout emerging Europe, where particularly in ongoing episodes inflation is very low, strong expectations of nominal appreciation in the pure floating countries or hard pegs in the currency board countries have made foreign currency borrowing quite attractive. Moreover, on the supply side, banks (predominantly subsidiaries or branches of foreign banks) have actively funded increased lending from parent banks and have been eager to lend in foreign currency so as to avoid taking open foreign exchange positions on their own balance sheets. Two concerns are most pressing in these circumstances.

**Figure 10: Bank Credit to the Private Sector Before and During Episodes
(period averages, in percent of GDP)**

Source: Levine (2006) and author's calculations.

- First, rapid credit growth appears to be feeding large increases in housing prices. Assessing the risks here is extremely difficult both because data on housing prices are scarce and not comprehensive and because sizable increases in housing prices are to be expected as the legacy of extremely repressed housing markets combines with countries' rapid catch-up to Western European income levels. The question is, how much is too much?
- Second, growing household exposures to foreign currency liabilities mean that any large exchange rate change would have severe effects on households' balance sheets and, should defaults increase, banks' balance sheets.

Thus far, in emerging Europe there are some sources of (uneasy) comfort. Bank lending and household indebtedness started at extremely low levels following the transition shock of the 1990s, so even large changes represent small absolute changes in indebtedness. Also, the banks most active in on-lending inflows to households have tended to be banks with the strongest capital positions.¹⁰ And finally, much of the lending is occurring through foreign-owned banks, the parents of which are likely to preserve their reputation by supporting troubled subsidiaries. Nevertheless, large-scale foreign currency lending—now showing up also in other regions—represents new terrain in the emerging market experience with large inflows.

¹⁰ See Tamirisa and Igan (2006).

3. Current Account Balances—Are Deficits a Problem?

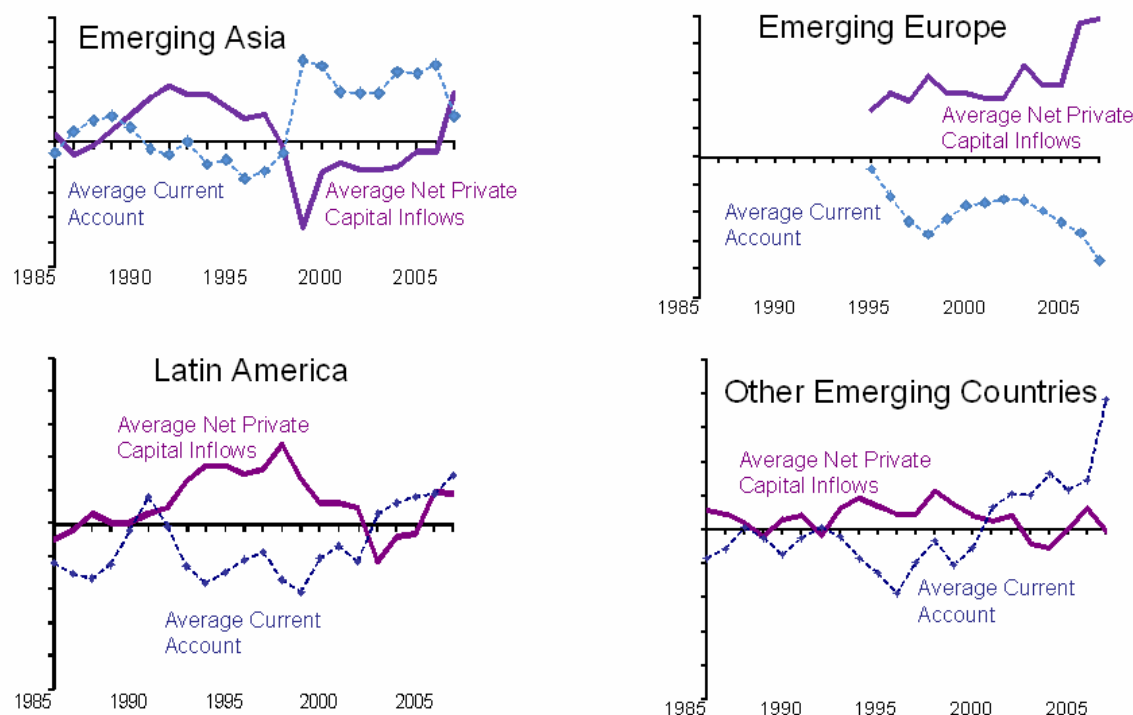
To a large degree, developments in current account deficits during inflow episodes reflect policy decisions. Net inflows represent capital from abroad invested in (FDI) or lent to (bonds, portfolio equity, and bank lending) entities in the recipient country. There are two possibilities for using such capital: i) effect the transfer (that is, purchase goods for investment or consumption in exchange for the inflow) immediately or over time or ii) take the capital out of the domestic economy (either directly by government taxation and saving or indirectly by official reserve accumulation with sterilization). The latter option (essentially investing in foreign assets) involves a cost for the receiving country equal to the gap between the opportunity cost of domestic use and the return the receiving country earns on assets held abroad.

How should countries approach this choice? Using foreign capital to raise investment or smooth consumption—both contributing to a widening of the current account deficit during the inflow period—makes sense if the receiving economy is well-run, has a financial system capable of intermediating inflows efficiently, and is likely to produce a high return on domestic investment. But running large current account deficits must be based on an underlying expectation that the economy can deliver rates of return adequate for repayment of debt.¹¹ Hoarding inflows in foreign exchange reserves makes sense as part of a strategy of absorbing inflows more gradually than they actually come in, of responding to inflows that are expected to reverse in a reasonably short period of time, or of accumulating a reserve cushion that would help strengthen market confidence in the resilience of the economy in the face of shocks.

The obvious conclusion is that widening deficits during inflows are not in themselves a problem. Nevertheless, developments vary widely. Episodes in the 1990s and ongoing episodes in emerging Europe and other emerging markets almost all were/are accompanied by rising current account deficits, whereas recent and ongoing episodes in emerging Asia and Latin America have tended to be accompanied by balanced or even surplus current account positions (Figure 11). While it is tempting to conclude that countries with balanced or surplus current account positions have a safer strategy than countries with deficits, this would fail to take into account other important considerations related to the growth orientation of the policy environment into which inflows are coming. Large inflows to a strongly performing economy are likely to produce deficits that are the counterpart of growth-oriented saving and investment decisions.

¹¹ Schadler, Mody, Abiad and Leigh (2006) have an empirical analysis of the interaction of growth and current account positions in Central and Eastern Europe.

Figure 11: Net Private Inflows and Current Account Positions, 1985-2006
(in percent of GDP)



Source: WEO and author's calculations.

III. CONTAINING OVERHEATING—THE ROLE OF MACROECONOMIC POLICIES

The broadly benign picture of average inflation and exchange rate pressures during episodes does not negate the importance of policy responses. First, even if averages and medians are not particularly worrying, outliers may be. Second, macroeconomic responses to overheating presumably played a role in containing unwanted pressures. Third, and most importantly, crises did happen. This section asks whether and how effectively the trilogy of macroeconomic policies for countering overheating effects from large inflows—sterilized intervention, changes in controls on capital inflows, and fiscal restraint—have been applied during the past 20 years.

I concentrate on the extent of real effective exchange rate appreciation as an indicator of overheating. It is not a perfect indicator, but others are more flawed. Inflation was generally falling in episodes not because overheating was absent, but because globally inflation was falling or low. Also several countries' success in disinflation was an important part of the attraction to large inflows. The considerations against using developments in the current account balance were laid out above. And output gaps are based on a critical unknown—potential GDP, or in an emerging market, the viable rate of catch-up to advanced country income levels. This leaves real appreciation as the best standard of comparison across countries. Clearly, it suffers as a measure of overheating

from the difficulty of determining the sustainable or equilibrium real appreciation for a catching-up country and from the fact that the more open an economy is, the less this indicator responds to demand pressures.

1. Sterilized Intervention

Assessing sterilized intervention entails two steps—determining the size of the intervention and determining the amount of sterilization undertaken. Many researchers focus simply on offset coefficients—the parameter relating change in net foreign assets (NFA) of the central bank to change in net domestic assets (NDA) of the central bank or base money. This is an essential piece of the puzzle, but it does not provide insight on how much sterilized intervention has taken place or how effective it has been in reducing overheating. To do this, more steps are needed. Following IMF (2007b), the following calculations are reproduced below.

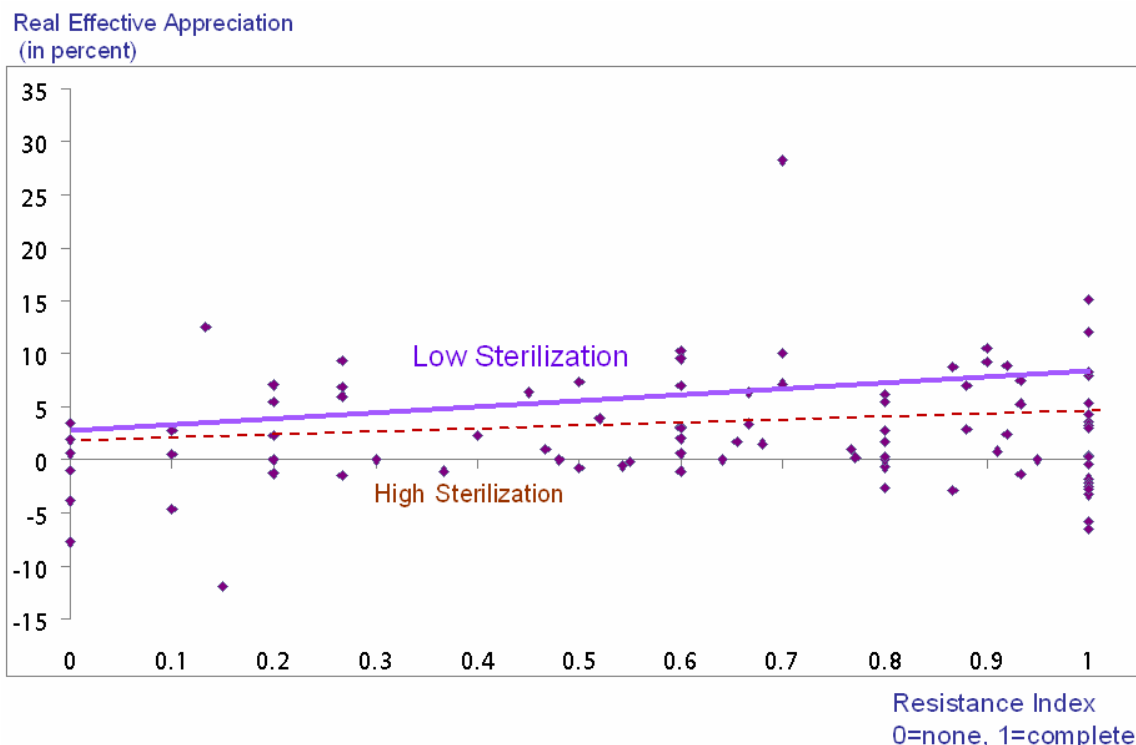
- First, an index of exchange market pressure (EMP)—a weighted average of percentage changes in the nominal exchange rate against a major reference currency and of changes in official foreign exchange reserves—is constructed.¹²
- Second, a resistance index is constructed as the change in official reserves as a proportion of the total EMP. The index, which can take on any value, is normalized to fall within the range of 1 (full resistance) to 0 (pure float).
- Third, countries are divided into two groups based on whether they have high or low sterilization coefficients.¹³ Comparing (between the two groups) the effects of intervention on the real exchange rate indicates whether countries that actively sterilize (or for some institutional reasons have higher offset coefficients) have lower real appreciations than those that do not.

The results bear out the general tendency of other research that fails to find a clear effect from sterilized intervention on the real exchange rate (Figure 12). Indeed, overall, stronger resistance appears to be associated with larger real appreciations, though the relationship is not statistically significant. Dividing episodes into those of countries with high offset coefficients and low offset coefficients produces a slightly less dismal picture of the ineffectiveness of intervention (the regression line shifts slightly clockwise), but it essentially becomes flat rather than downward sloping as interventionists would hope.

¹² This approach reflects the work in IMF (2007b). In fact, using the change in the nominal exchange rate as one of the two indicators of exchange market pressure is flawed for the episodes under consideration, where many disinflating countries had depreciating currencies during their episodes even though they were facing (and attempting to limit) exchange market pressures that slowed the pace of depreciation.

¹³ The offset coefficient is the estimated β in the equation $\Delta NDA = \alpha + \beta \Delta NFA + \mu$ where NDA is net domestic assets and NFA is net foreign assets, both of the central bank.

**Figure 12: Real Appreciation and Intervention
(all episodes)**



Source: IMF (2007b) and author's calculations.

This traditional approach to examining the effectiveness of sterilized intervention is not perfectly suited to the emerging market countries under review. The approach was developed to examine monetary responses to inflows in countries with substantial exchange rate flexibility. The question addressed in this approach is whether sterilized intervention in such circumstances can counter market pressure, at least partly by influencing expectations about future exchange rate changes. In contrast, many of the countries under review here have monetary frameworks based on fixed or highly controlled nominal exchange rates. For these countries, a commitment to sterilized (or, in the case of currency boards, unsterilized) intervention, in some cases in conjunction with capital controls, is a central pillar in maintaining fixed or crawling nominal exchange rates. The key question for this subset of countries is whether the cost of sterilized intervention in the face of large capital inflows becomes prohibitive as the length of inflow episodes grows.

2. Capital Controls

The effect of capital controls on a wide range of economic developments is the subject of much passion, yet continuing ambiguity. Chile's *encaje* has for years been the case to study. In an explicit effort to prevent real appreciation in the face of rising short-term inflows in the early 1990s, an unremunerated reserve requirement (*encaje*) on banks was introduced and its coverage expanded many times, while capital outflows were liberalized. The *encaje* was largely dismantled by 1998. Evidence on the experience has been mixed. Many studies suggest that the measures did change the maturity of inflows at least for a time, though the weight of the evidence seems to be that they did not significantly influence the total volume of flows (Chile's episode as defined in this paper

runs from 1988-1997) or the change in the real value of the peso.¹⁴ At the same time, evidence on microeconomic costs—disproportionate limitations on small firms' access to borrowing, disintermediation of banking, and reduced market discipline in financial markets and the government—suggests that there is no free lunch.¹⁵ Yet even though much analysis points to limited gains and non-negligible costs, “Chilean-style” market-based capital inflow controls have been the subject of considerable interest even on the part of the IMF.¹⁶ Indeed, subsequently, when faced with rising inflows several countries (Colombia, Malaysia, Romania, and Thailand to name a few) with relatively liberal capital accounts have introduced reserve requirements on banks borrowing from abroad.

Evidence from across the episodes identified for this paper does not change this picture. IMF (2007b) reports that relating the size of real appreciation to the *average level* of controls during episodes gives a small but statistically significant negative relationship. This suggests the rather intuitive notion that tightly controlled systems are more impervious to inflows than more liberalized systems. But, it does not answer the question whether countries that have liberalized might find an effective hindrance to large capital flows by reversing some of the liberalization. The question asked here, therefore, is whether intensification of restrictions—market-based or outright controls—during a surge episode has a discernable effect on real appreciation (Figure 13).¹⁷ It appears not. The relationship—though slightly negative (i.e., a tightening of controls on inflows or easing of controls on outflows is associated with lower real appreciation)—is not statistically significant. The relationship between the increase in non-FDI inflows during the episode and the change in capital controls is slightly more negative, though still not statistically significant (Figure 14). The implication is that having started down the liberalization path, countries find it difficult to regain control, if for no other reason than because agents that have accustomed themselves to integration in the global financial system tend to seek and find ways around controls or taxes. That said, the indexes of controls used here are still quite primitive, without reasonable differentiation of types of controls and their relative effectiveness. Moreover, the IMF's index of controls based on the AREAER (see footnote 17) does not capture many types of prudential changes known as “market-based” controls. Further progress in understanding possible roles for efficient discretionary use of capital controls or prudential measures will require more finely tuned measures as well as assessment of micro data.

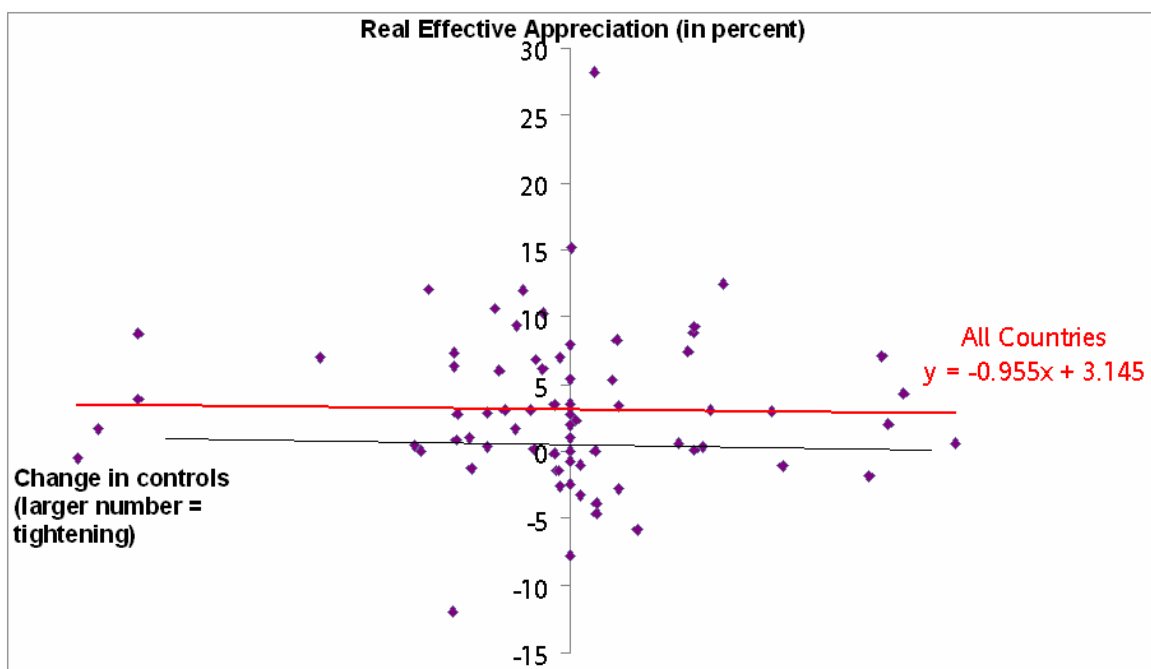
¹⁴ See Cowan and De Gregorio (2005).

¹⁵ Forbes (2005) reviews the micro evidence.

¹⁶ See Fischer (2001).

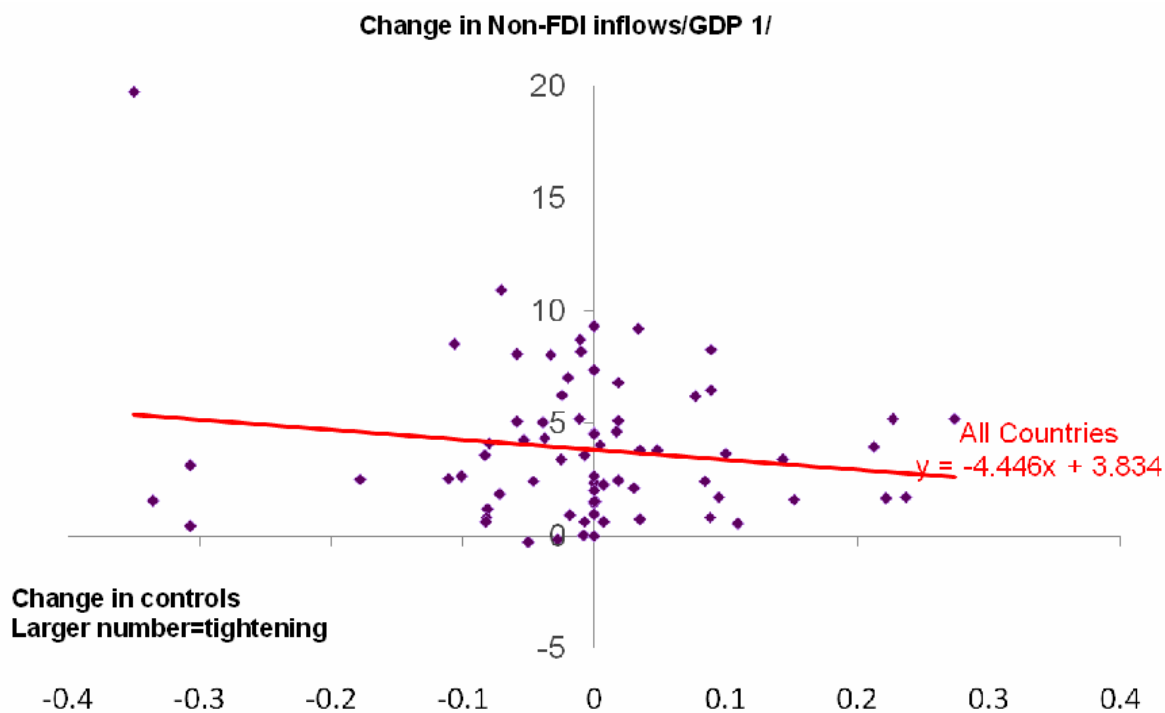
¹⁷ The measure of capital controls is taken from IMF (2007b). It is based on a summary of the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER) representing indices on nine dimensions of controls on inward and outward capital flows—on capital and money market instruments, on FDI, and on personal capital movements.

**Figure 13: Real Appreciation and Changes in Capital Controls
(all episodes)**



Source: IMF WEO and author's calculations

**Figure 14: Non-FDI Inflows and Changes in Capital Controls
(all episodes)**



Source: IMF (2007b) and author's calculations.

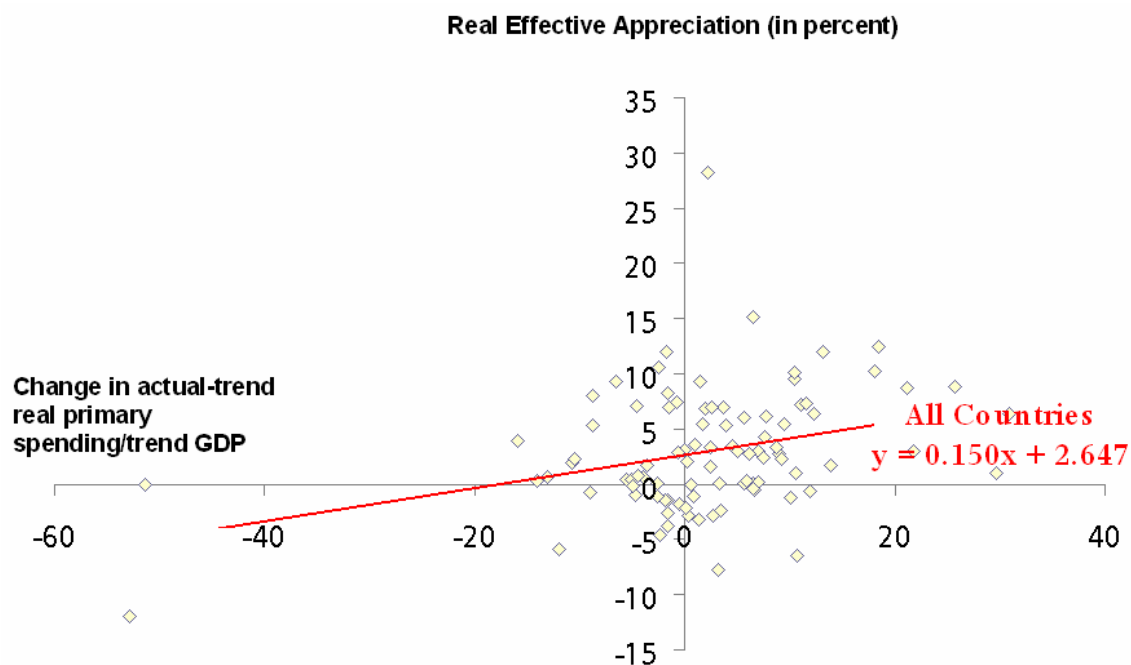
3. Fiscal Restraint

In what may seem a bleak landscape of macroeconomic policy options for addressing unwanted effects of large capital inflows, fiscal policy stands out. Several dimensions of fiscal policy restraint can help in an inflow episode. Most obviously, fiscal restraint works to rein in the growth of domestic demand, either directly by slowing the growth of government demand or indirectly by increasing tax receipts from the private sector. At the same time, by reducing pressure on financial markets from government financing requirements, fiscal restraint also puts downward pressure on interest rates—directly reducing incentives for interest rate-related inflows. And finally, since large inflows almost always occur during periods of domestic cyclical strength, a counter-cyclical fiscal policy should help reduce volatility of inflows by ensuring that debt will remain at sustainable levels even after surge episodes end. A frequent criticism of this reasoning is that restrictive fiscal policy, by increasing confidence of capital markets in a country's future stability, actually attracts capital. Perhaps so, on a quite transitory basis. But over time sustainable fiscal policy should help attract the most stable and committed types of capital rather than “hot” money.

Yet strangely, less empirical work exists on the effects of fiscal policy in episodes of large capital inflows than on the other—generally less effective—policy responses. One possible explanation is that few governments actually respond to large capital inflows with fiscal restraint: it is hard to analyze empirically a policy that is so seldom used. Indeed, Kaminsky, Reinhart and Vegh (2004) demonstrate that the preponderance of countries receiving large capital inflows have strongly pro-cyclical fiscal (as well as monetary) policy, both during and after the inflow episode. So not only are the capital inflows themselves pro-cyclical, but governments tend to exacerbate the cyclical volatility with pro-cyclical policies. The search for stability should surely start with fiscal policy.

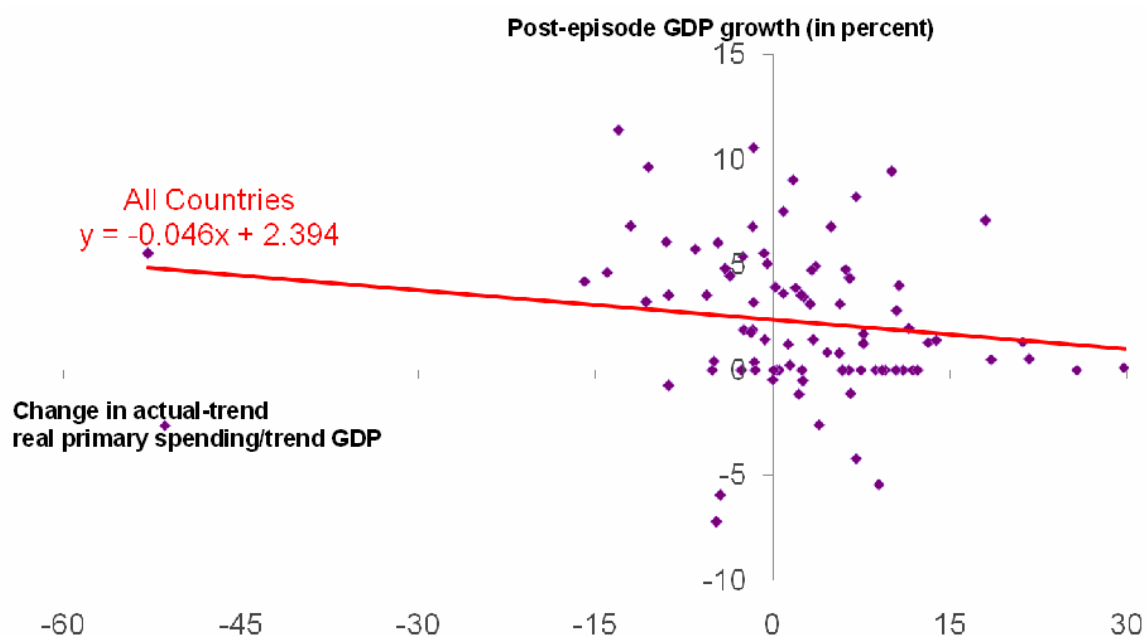
Evidence from the capital inflow episodes speaks to the role fiscal restraint should play in limiting appreciation and minimizing any post-episode slowing of growth. Following IMF (2007b), the stance of fiscal policy is measured here as the change in the gap between actual real primary government expenditure and its trend derived from a Hodrick-Prescott filter: an increase in the gap (or positive number) indicates an expansionary stance. Broader measures based on the cyclically adjusted overall or primary balances would be even better. Figure 15 plots changes in the real effective exchange rates during inflow episodes against changes in the gap between actual and trend spending during the period. Bearing out results in IMF (2007b), relationships are consistently positive (larger cyclical increases in government spending are associated with larger real appreciations). Moreover, changes in the gap between actual and trend spending during episodes are negatively related to post-episode GDP growth—that is, higher pro-cyclical fiscal stimulus during episodes increases the risk of a hard landing (Figure 16). Further support for the strength of this relationship is given in IMF (2007b), which reports the results of a regression analysis of the real appreciation and post-episode GDP growth on the main domestic policy variables and key global conditions (interest rates and growth). The evidence points to the conclusion that fiscal policy is the only domestic policy instrument with a significant constraining effect on either real appreciation or augmenting effect on post-episode growth.

**Figure 15: Real Appreciations and Fiscal Expansion During Episodes
(all episodes)**



Source: IMF WEO and author's calculations.

**Figure 16: Post-Episode GDP and Expansionary Fiscal Policy During Episodes
(all episodes ending in or before 2004)**



Source: IMF WEO and author's calculations.

Why, then, is the record of using counter-cyclical fiscal policy during inflow periods so dismal? There are the obvious political difficulties of undertaking significantly restraining fiscal measures when times are good. In addition, it is genuinely difficult to distinguish cyclical from underlying changes in the pace of activity. Frequently, countries receiving inflows have experienced changes in the macroeconomic landscape (such as initial success with disinflation programs, a change in the political regime, or, as in the case recently of much of emerging Europe, closer links with neighboring advanced countries). In these circumstances, it is difficult to assess the size of the beneficial effects on potential growth rates: the tendency is frequently to overestimate. Both of these difficulties are best addressed through the development of and commitment to a medium-term framework for fiscal policy.¹⁸ Indeed, the fiscal record of countries receiving large inflows speaks strongly to the value of governments committing to clear and binding fiscal rules that guide fiscal decisions most importantly during periods of large change. In this vein, one of the paradoxes in the debate on how to respond to surges in capital inflows is that Chile is so frequently examined for the role of prudential measures in reducing the volatility of inflows. In fact, the more important feature of Chile's experience is its adherence to a fiscal rule that went a long way toward reducing the pro-cyclicality of fiscal policy.

IV. SUCCESSFUL AND CRISIS ENDINGS TO INFLOW EPISODES: WHAT DIFFERS?

Some countries have done exceptionally well out of their inflow episodes, and their experience is at least as instructive as that of countries that have had more difficulty. The goal in this section is to examine episodes from the perspective of these countries, asking how they managed their macro policies and how successful episodes worked out. To do this, I sort the episodes into four groups: those ending in crisis as defined earlier in the paper; those that had satisfactory endings; those that had strong endings; and those that are ongoing or ended in 2005 (and therefore cannot be classified by the immediate post-inflow developments). Attempting to achieve the greatest symmetry vis-à-vis the definition of crisis, I define successful episodes as those where real GDP growth in the two post-episode years is above trend and the real effective exchange rate depreciated by less than 2 percent. The episodes that fit into neither crisis nor successful groups are collected in a category called satisfactory. These are episodes where GDP growth in the two post-episodes years was below trend, but was above -2 percent and where the real effective exchange rate fell less than 20 percent or even rose.

Basic characteristics of the various groups of episodes were similar, but policy management and results differed significantly (Table 1). Median duration of the episode, at 2-3 years, was similar, and, rather surprisingly, the groups were not distinguishable in terms of the annual average size of the net inflows during the episodes. Similarities stop there. More successful episodes generally had higher shares of FDI in total inflows, though the most successful group had an (insignificantly) lower share than the group with satisfactory endings. Use of intervention to absorb exchange market pressure was, if anything, greatest in the group with satisfactory endings and lowest in the group ending in crisis. Similarly, the use of capital controls was lowest in the crisis group, though in all, median capital controls were modest. The starkest difference in the policy response came in fiscal policy. In contrast to a median fiscal expansion during episodes ending in crisis, the median of episodes ending most successfully saw fiscal contractions.

¹⁸ See Schadler (2005) for a review of experiences with fiscal rules and fiscal responsibility laws.

The difference between the average fiscal performance of the group ending in crisis and that of the group ending most successfully was highly statistically significant.

These differences were reflected in less demand pressure during episodes and more robust GDP growth after the episode in the most successful group vis-à-vis others. Returning to the measure of demand pressures favored in this paper, median annual real effective appreciation in the most successful group, at 2.4 percent, broadly matched many estimates of Balassa-Samuelson and other catch-up effects on the real exchange rate. In contrast, the group of satisfactory episodes saw median appreciation of 5.4 percent, and the crisis episodes experienced 6.5 percent annual real appreciation. Post-episode GDP growth and inflation differentials bear out the salutary effects of this restraint.

In this metric, ongoing episodes have both strong and worrying features. Median inflows (relative to GDP) are comparatively large, yet the share of FDI is high. The group of countries with ongoing episodes has low reliance on capital controls and modest inclination to intervention. Of greatest concern is the strikingly lax median fiscal stance according to the measures used here. In turn real appreciations have been sizable. Thus, except for the reassuring developments in FDI, medians point to some cause for concern.

V. PROTECTIVE MEASURES

The best way to prepare for post-episode disruptions is to ensure that policies support robust long-term growth. Setbacks arising from exogenous shocks will always be more easily weathered if underlying prospects for strong growth and economic resilience are good. That said, overheating, asset bubbles, and sharp changes in investor sentiment happen, so mechanisms and cushions to help absorb them are good policy.

In this vein, first thoughts turn to reserve accumulation. The sharp increase in reserve holdings since 2000, dominated by the largest emerging market countries, has taken the reserves relative to almost any standard—the traditional imports of goods and services, GDP, foreign currency short-term debt by remaining maturity as advocated by Guildotti and Greenspan, or, most broadly, M2—to exceptionally high levels.¹⁹ But this surge in reserves has not been universal. Excluding Brazil, People's Republic of China, India and Russia, increases in reserves for regional groupings have on average been more moderate.

The key question is, how much safer are countries with higher reserves, and, if they are safer, at what price does the safety come? While large reserve accumulation is often seen simply as the result of intervention to stem currency appreciation, Obstfeld et al. (2007) argue that it rather fits a rational response of central banks to their lender of last resort function when increases in financial openness and fragility create the potential for internal and external drains on the banking system. This means that the motivation for holding very large reserves is not to secure the resources to smooth short-term volatility of exchange rates, but rather to have resources on hand to deal with crisis situations. A practical question, however, is whether the optimal response to severe disruptions, say to the banking system following a sudden stop or reversal of capital inflows, would best be dealt with by using extremely large foreign reserves. Could the existence of such large reserves even create some moral hazard if agents perceive a ready source of funds for

¹⁹ See Greenspan (1999).

bail-outs in the event of crisis? In light of such doubts, questions such as those raised by Rodrik (2006) about the social costs of large reserve holdings take on particular importance.

Reserve sharing arrangements among countries are an obvious way to deal with the preference for having significant levels of reserves when reserve holding is costly. At one end of the spectrum of such arrangements is the IMF, with universal membership, but fairly strong, and not always politically comfortable, conditions on the use of collective reserves. At the other end is the euro area, which of course goes well beyond a simple reserve sharing arrangement to provide also the safety of a currency union—an obvious attraction for emerging European countries that are new members of the European Union (EU). The euro area therefore effectively combines a reserve-sharing arrangement with a solution to the difficulties of coordination of exchange rate moves within a region of export competitors. The gains for the new members of the EU from prospective euro adoption appear to be substantial.²⁰ Indeed, it appears that simply the prospect of membership in the euro area within the next 7-8 years has bolstered market confidence in the region's currencies and reduced risk premia on sovereign foreign currency debt.²¹ Correspondingly, prospective euro adoption may well be one of the reasons why the new members of the European Union, excluding the four currency board/hard peg countries, are among the lowest reserve holders of emerging market countries. Key to the success of any reserve sharing arrangement is, first, political compatibility among participants and, second, clear ground rules (with some form of power of enforcement granted to the center) on the limits to both fiscal and monetary policy choices.

A promising direction in recent research is exploring the link between domestic financial market structure and institutions and capital inflows, including volatility. A priori, it stands to reason that the more open, deep, transparent and well-regulated a financial system is, the more attractive it should be to foreign capital, though there is little empirical work to establish this contention firmly.²² Whether these characteristics also contribute to lowering volatility by attracting less “hot” money and by reducing the skittishness of investors is even less researched, though IMF (2007c) provides a first pass at an answer.

The early results suggest that a range of structural and institutional characteristics of domestic financial markets influence the size and, most likely, the volatility of inflows. Using panel data covering 15 developed and 41 emerging market countries during 1977-2006, IMF (2007c) finds a statistically significant positive relationship between the size of net capital inflows and equity market turnover, financial openness, and corporate governance quality. Perhaps even more interesting, however, is the finding from the same dataset that more financial openness is associated with lower volatility of inflows. Equity market turnover, equity market capitalization, and the quality of accounting standards also have negative relationships with volatility, though they are not statistically significant. A more heuristic examination of the bivariate relationship between a number of dimensions of governance (regulatory quality, government effectiveness, rule of law,

²⁰ See Schadler et al. (2004) for an analysis of costs and benefits of euro adoption for emerging Europe.

²¹ See Luengnaruemichai and Schadler (2007) for an empirical model investigating the compression of spreads in the new members of the EU.

²² This is in contrast to the question of whether financial openness and development have benefits for output and investment growth, on which there is a rather substantial body of work, though the results are not particularly clear. See Edison et al. (2004) for a review.

control of corruption, political stability, and voice and accountability) also reveals systematically negative relationships. The strength of these conclusions needs further examination, but the early message is that countries might be able to significantly reduce the volatility of inflows by targeted development of their financial markets.

Another dimension of financial infrastructure crucial for inflow recipients is supervision and prudential control of banks. In this vein, the objective is less that of limiting “hot” or other inflows as discussed earlier, and more that of protecting the domestic banking system from the hazards of rapid credit growth during inflow episodes. Generally, meeting this objective does not open *new* questions on supervisory practices, so much as it reinforces the need for strict adherence to best-practice, independent bank supervision. However, two tricky issues have become quite important, particularly in emerging Europe: first, whether and how to regulate foreign currency (indexed or denominated) lending, particularly to households, which are unlikely to be hedged; and second, whether and how to limit rapid increases in mortgage lending (substantially funded by bank borrowing from abroad) that in some countries risks feeding housing market bubbles. Clear answers exist for neither of these questions. On the first, limiting foreign currency (mortgage) lending would be a rather blunt instrument for the basic objective of ensuring that banks’ risk management adequately accounts for risk from foreign currency lending. As with many other prudential measures to discourage inflows to banks or credit growth of banks, such instruments run high risks of promoting disintermediation from the domestic banking sector. On the second, more active consideration needs to be given to fiscal instruments of control. For example in economies where housing prices are rising rapidly enough to raise serious concerns about a bubble, real estate transaction taxes can play a useful role in slowing trades and price increases.

VI. CONCLUSION

The experience over the past 20 years of emerging market countries with surges in capital inflows confirms some common perceptions but casts doubts on others. Specifically, only a modest portion of the episodes have ended in crisis and overheating pressures have not in general been severe. True, rather volatile non-FDI inflows have been an important determinant behind the shape of surges. But sizable and more stable increases in FDI have also contributed to episodes of large inflows. Policy responses to large inflows are not futile. But whereas much attention is focused on the finely balanced debate as to whether sterilized intervention or capital controls are effective, insufficient attention is focused on the policy most likely to have a strong and constructive effect: fiscal policy. Indeed, fiscal policies have tended to be pro-cyclical, aggravating an already pro-cyclical pattern of capital inflows.

That said, the risk of crisis as financial integration increases will never disappear, and countries must pursue protection from risks of volatility and sudden stops. In this vein, it is far from clear that recent large accumulations of official reserves in some countries are a cost effective defense against serious crises (as opposed to providing the means for smoothing volatile market conditions). But strengthening financial sector supervision, and considering fiscal disincentives to excessive asset price increases that could turn into bubbles, makes sense.

This review has raised a number of issues on which further research could push the frontier on the political economy of dealing with large capital inflows. Four are particularly worthy of mention here.

- The impact of fiscal policy responses to surges in capital inflows has not received enough attention in the literature. This, despite the fact that counter-cyclical fiscal responses appear to be the only clearly effective way to reduce overheating pressures associated with large capital inflows. Three dimensions suggest themselves for further study. First, the evidence to date that fiscal policy in the face of surges in inflows tends to be pro-cyclical is alarming and needs to be subjected to continuing research scrutiny. Second, what would be the most effective types of fiscal policy responses in terms of political feasibility, shortest implementation lags, and effectiveness in countering adverse effects of inflows? What role should fiscal rules play in preparing for inflow episodes? Third, are there possible synergies between fiscal prudential measures (for example raising transfer taxes on real estate transactions) and fiscal measures for macroeconomic objectives?
- The possibility of co-movements and interdependencies among various categories of capital inflows and outflows should be examined. Most studies have very aggregated classifications of types of flows—at best, FDI, portfolio equity, bonds, and bank loans, though more commonly FDI and non-FDI. This precludes addressing a range of important questions such as when inflows should be interpreted as “hot”; whether there are links between increases in FDI and increases in non-FDI (for example an FDI purchase of a bank followed by an increase in parent funding of the subsidiary) that should affect the level of concern about the stability of inflows; and what characterizes the differences between inflows to countries with more and less open financial sectors.
- Prudential or market-based measures to limit inflows (particularly of “hot” money) are receiving increasing attention from researchers, but the measurement of such measures is at best highly imprecise. More work is needed to establish a metric that would allow more research on prudential measures outside the confines of case study approaches.
- A key issue both for emerging markets and for lower income countries that are likely to be the next wave of recipients of large inflows is how financial sector development affects the size and, even more importantly, the volatility of inflows. Is the finding in IMF (2007c) that greater financial sector openness reduces volatility robust to other techniques and data sets? What dimensions of institutional development would have the largest impact on the volatility of inflows?

APPENDIX: COUNTRY AND EPISODE GROUPS

Emerging Asia: People's Republic of China; Hong Kong, China; India; Indonesia; Republic of Korea; Malaysia; Philippines; Singapore; Thailand; Viet Nam

Emerging Europe and CIS: Albania, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Russia, Slovenia, Slovakia, Ukraine

Latin America: Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Paraguay, Peru, Uruguay, Venezuela

Other Emerging Markets: Algeria, Egypt, Israel, Morocco, Pakistan, South Africa, Tunisia, Turkey

Episodes Ending in Crisis

India (1988-90)
Thailand (1988-96)
Malaysia (1989-96)
Mexico (1990-94)
Indonesia (1990-96)
Korea (1990-96)
Bulgaria (1992-93)
Turkey (1992-93)
Paraguay (1994-97)
Hong Kong, China (1997)
Venezuela (1997-98)
Argentina (1997-99)
South Africa (2000)
Philippines (1987-97)
Uruguay (2000)

Episodes with Satisfactory Endings

Slovak Republic (2002)
Chile (1988-97)
Argentina (1992-94)
Peru (1992-97)
India (1994)
South Africa (1995)
Israel (1995-97)
Turkey (1995-2000)
Romania (1996-98)
Slovak Republic (1996-98)
Cyprus (1997)
Tunisia (1998-99)
Hong Kong, China (2000)
Brazil (2000-2001)
Cyprus (1989-92)
Venezuela (1991-93)
Pakistan (1991-96)
Egypt (1992)
People's Republic of China (1993-95)
Colombia (1993-96)
Malta (1993-2000)
Brazil (1994-96)
Costa Rica (1995)
Poland (1995-2000)
Estonia (1996-98)
Uruguay (1997)
Lithuania (1997-98)
Costa Rica (1999)
Viet Nam (1999)
Cyprus (1999-2001)
Albania (2000)
Mexico (2000)
Slovenia (2001-02)

Episodes with Strong Endings

People's Republic of China (2004)
 Costa Rica (1987-92)
 Morocco (1989-94)
 Singapore (1990-91)
 Romania (1990-93)
 Tunisia (1990-94)
 Hungary (1991-2000)
 Viet Nam (1994)
 Czech Republic (1994-95)
 Latvia (1994-95)
 Albania (1997)
 Mexico (1997)
 Slovenia (1997)
 Egypt (1997-98)
 Croatia (1997-99)
 Morocco (1997-2001)
 Czech Republic (2000-02)
 Republic of Korea (2003)
 Russia (2003)
 Republic of Korea (1999-2000)

Ongoing Episodes (or ended in 2005)

Turkey (2003-
 Viet Nam (2003-
 Colombia (2004-05)
 Romania (2004-
 South Africa (2004-
 Tunisia (2004-
 Hungary (2005)
 Paraguay (2005)
 Slovak Republic (2005)
 Ukraine (2005)
 Cyprus (2005-
 Egypt (2005-
 Lithuania (2005-
 Lithuania (2005-
 Malta (2005-
 Pakistan (2005-
 Thailand (2005-
 Uruguay (2005-
 Russia (2006-
 Bulgaria (1997-
 Latvia (2001-
 Costa Rica (2002-
 Croatia (2002-
 Estonia (2002-
 India (2002-

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