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# Capital Flows and Macroeconomic Policy in Emerging Economies

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# PREFACE

This study, prepared by Manuel R. Agosin, the Department's Regional Economic Advisor, deals with the appropriate macroeconomic policies toward international capital flows.

Undoubtedly, the countries served by the Regional Department are very heterogeneous as regards their degree of integration into international financial markets. One can think of the region as consisting of three groups of countries, according to their access to private financial markets. First, Mexico is well integrated into international financial markets and, in fact, underwent a major financial crisis at the end of 1994. A second group is made up of Costa Rica, El Salvador, Guatemala, Dominican Republic, and to a somewhat lesser extent, Belize. These countries have been able to place government bonds in international financial market over the last decade. However, the extent to which domestic private markets are integrated into international financial markets is still limited. Third, Haiti, Honduras and Nicaragua largely do not have access to private markets and depend to a great extent on concessional flows.

However, if the past is any guide to the future and as Group 2 and Group 3 countries raise their levels of income and improve the performance of domestic financial markets, they will face the challenges of integrating more fully into international financial markets. This paper indicates the policy options that are involved in so doing. An important aspect relates to the need to improve the banking system, with a view to avoiding currency mismatches between assets and liabilities. This is a particularly important task in most Central American countries, where most financial transactions are dollarized. Second, private capital inflows tend to be volatile and large relative to the size of recipient economies. This means that bank reserve requirements for non-performing loans should take into account the cyclical position of the economy. In addition, unsustainable booms, and ensuing busts, caused by exogenous capital flows can be moderated by counter-cyclical fiscal policy. Unfortunately, in most countries in the region fiscal policy continues to be strongly pro-cyclical.

This paper was prepared for the Barcelona meetings of the Macroeconomic Policy and Capital Market Liberalization Task Forces of the Initiative for Policy Dialogue, led by Professor Joseph Stiglitz, of Columbia University. The meeting took place on June 2 and 3, 2003.

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# CAPITAL FLOWS AND MACROECONOMIC POLICY IN EMERGING ECONOMIES

## I. Introduction

As a consequence of the foreign capital surge experienced by many developing countries, since the early 1990s international economists and policy makers have been debating whether foreign capital flows should be the object of specific policy. The debate has crystallized into two opposite stances. On the one hand, some claim that capital flows are not only primarily exogenous to the recipient countries but also destabilizing (see, for example, Agosin and Ffrench-Davis, 1996 and 2001). This view recommends that economic authorities should design and implement policies to dampen the impact of capital flows on domestic macroeconomic variables. The opposing view departs from the assumption that capital flows largely respond to domestic variables, whether they are long term (i.e., affecting the country's risk premium) or related to short-term demand management. This approach argues that there is no need to worry explicitly about capital flows and that policy makers should concentrate exclusively on improving domestic policies.

Falling risk premiums resulting from economic reform have often been cited as the explanation for inflows into Latin American countries in the early 1990s. But persistent capital inflows led to changes in perceptions. Inflows that were deemed too large (as they were during a good part of the 1990s in several so-called emerging markets) were said to result from maintaining tight money or lax fiscal policies. With such policies in place, this argument goes, domestic interest rates will rise above risk-adjusted international rates, and large capital inflows will ensue.

In the same vein, it is argued that, flow reversals and, particularly, massive capital flight could only be the effect of poor policies. The policy misbehavior often cited as responsible for a rise in the risk premium and ensuing capital flight is a chronic fiscal deficit (as in Argentina).[1] As for short-term factors, policies that keep risk-adjusted interest rates below international interest rates would lead to "excessive" outflows.

This view is contradicted by a couple of observations. First, that a fall in the country risk premium explains capital inflows is easily discounted, since countries experiencing large inflows in the 1990s included some that had undertaken fundamental, pro market reforms (the kind of variable that allegedly determines a country's risk premium) and others that had not. Second, that inappropriate policies leading to high interest rates were responsible for excessive capital inflows does not hold water, since capital flowed into countries with the most diverse exchange-rate regimes (nominal anchors, floating rates, or crawling pegs), countries with persistent fiscal deficits and others with consistent fiscal discipline, and countries where central banks practiced tight money and others where monetary policy was loose.

[1] This view is best articulated in Mussa (2002).

In fact, an early and influential analysis of the capital surge to developing countries ascribes it mostly to the effect of falling international interest rates (Calvo, Leiderman, and Reinhart, 1993). There were other factors as well, most of them exogenous to emerging economies. In particular, the recession in developed countries reduced rates of return on capital and made investors look for higher returns elsewhere. Likewise, the Asian and Russian financial crisis led to a generalized retreat of foreign capital from most emerging economies, regardless of the quality of domestic policies. In all cases, the reversal of the 1990s inflows was dramatic, and it was accompanied by a sharp deterioration in growth performance.

This paper argues that countries in a position to integrate themselves into world capital markets should develop specific policies to deal with capital flows. Such policies should take into account the effects – sometimes desirable, other times deleterious – of capital flows on long-term growth. These include macroeconomic stability, but they go well beyond it. Conventional macroeconomic prudence (balanced budgets and sound money) are insufficient. Capital inflows are largely exogenous and volatile; because they are very large compared with the size of the financial sectors of recipients, they can be very destabilizing. Such volatility normally leads to highly unstable key parameters, such as the real exchange rate and real interest rates< this instability has an adverse effect on long-run growth and leads to excessive volatility in the real economy.

This paper first shows that foreign capital inflows are not only larger and more volatile but also that their effects on key macroeconomic variables are much stronger in emerging developing countries than in developed countries. Next, the two opposing paradigms regarding capital flows are discussed in detail. Then, a simple classical open-economy macroeconomic model is presented as a benchmark against which to analyze the effects of unfettered capital flows. According to this model (which is the basis of conventional advice), there is nothing that policy makers need to do about capital flows, but to follow sound domestic macroeconomic policies. But once the key assumptions of the model are dropped, the effects of capital flows that one can observe in reality begin to emerge. Appropriate conclusions can then be derived.

## II. How important are international capital flows in emerging economies?

Capital flows to emerging economies are very large relative to relevant macroeconomic variables; they are also much larger than flows to developed economies and more volatile. As a consequence of these characteristics, they are more destabilizing. Since what matters for this paper is the size of capital inflows relative to the size of domestic financial markets, capital flows are calculated as a share to broad money supply (M2). Other indicators of financial development – stock market daily turnover or capitalization, daily bond trading – suggest that financial markets in developing countries are even shallower than what one might glean from M2-to-GDP ratios.

As shown in table 1, the ratios of capital flows to M2 in the developing countries sampled (which are among the main recipients of capital inflow in the 1990s) are several times (in absolute values) the levels recorded in the developed countries included in the

table. Figure 1, which shows these ratios year by year over 1990-2001, highlights the huge differences between developed and developing countries in this regard. When a country experiences inflows of between 10 and 20% of its money supply (which was not uncommon during the 1990s) rather than capital movements (inflows or outflows) between 0 and 6% (as in developed countries), both the potential for destabilization and the policy difficulties of dealing with the inflows are of a higher order of magnitude.

Flows are not only larger (relative to the size of their financial markets) but also more volatile in developing countries. Table 1 describes the particularly high volatility of flows in two ways. First, the standard deviation of annual flows relative to M2 is shown to be much larger in developing than in developed countries. Second, the table shows measurements for the average annual ratios of capital flows to M2 for the period characterized by heavy capital inflows (1990-97) and then for the period of foreign capital drought (1998-2001). Again, the changes in the ratio of capital flows to M2 are much larger for emerging economies than for developed countries.

Figure 1 shows not only how volatile flows have been but also the frequent changes of sign in the direction of flows: both inflows and outflows are large relative to M2, and they are prone to change direction from one year to the next. By contrast, flows to and from developed countries demonstrate more predictable patterns: Japan and Switzerland, for example, are capital exporters consistently during 1991-2001, and the United States is a consistent capital importer.

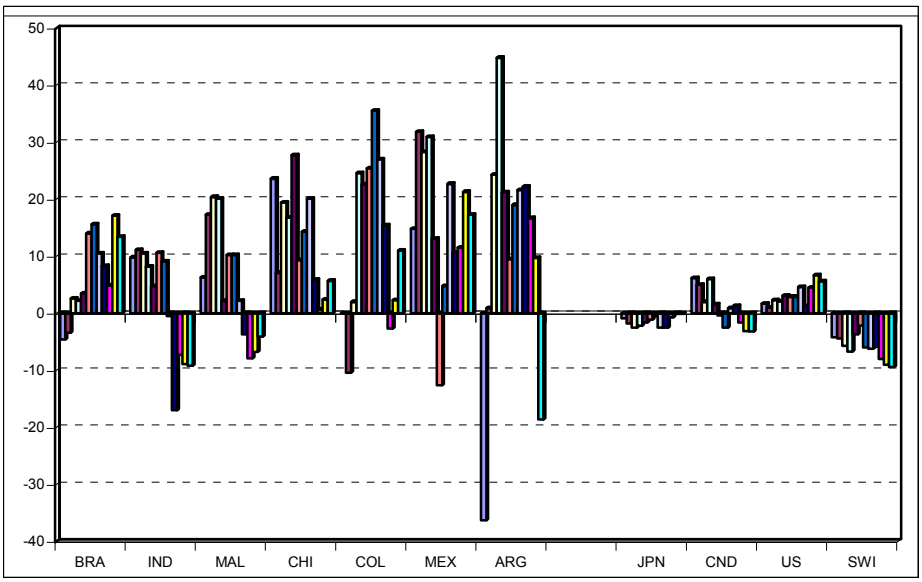
**Table 1**
**Annual capital flows to developed and emerging economies, as a share of M2, 1990-2001**
(percentage)

| | 1990-2001 Mean | 1990-2001 St. dev. | 1990-1997 Mean | 1990-1997 St. dev. | 1998-2001 Mean | 1998-2001 St. dev. |
|---|---|---|---|---|---|---|
| Japan | -1.4 | 0.9 | -1.6 | 0.7 | -1.2 | 1.2 |
| Canada | 1.0 | 3.4 | 2.3 | 3.1 | -1.2 | 2.2 |
| United States | 3.2 | 1.8 | 2.6 | 1.1 | 4.6 | 2.0 |
| Switzerland | -6.0 | 2.1 | -4.9 | 1.5 | -7.7 | 1.6 |
| | | | | | | |
| Korea | 3.6 | 4.6 | 4.8 | 4.6 | 0.0 | 4.3 |
| Brazil | 7.0 | 7.3 | 5.1 | 7.6 | 10.8 | 4.7 |
| Indonesia | 1.8 | 9.9 | 8.0 | 4.0 | -8.6 | 5.9 |
| Malaysia | 5.5 | 10.2 | 11.1 | 7.4 | -4.1 | 4.0 |
| Venezuela | -2.9 | 15.5 | -2.7 | 18.3 | -1.3 | 9.6 |
| Chile | 12.7 | 8.8 | 17.3 | 7.0 | 7.0 | 7.7 |
| Colombia | 12.7 | 14.4 | 15.8 | 16.3 | 10.6 | 11.6 |
| Mexico | 16.2 | 12.4 | 16.7 | 15.2 | 16.7 | 5.5 |
| Ecuador | -5.8 | 53.0 | 10.2 | 14.1 | -30.3 | 78.3 |
| Argentina | 11.2 | 21.3 | 13.1 | 23.6 | 10.3 | 16.9 |

*Source:* International Monetary Fund, *International Financial Statistics*, various issues, Washington, D.C.

The volatility of capital inflows is not primarily of a short-term nature. As table 1 exemplifies, long swings of large inflows (1990-97) are followed by long swings in outflows, or, at least, by much diminished inflows (1998-2001). These swings require very large adjustments in the current account. During periods of large inflows, countries are able to run large current-account deficits, which must necessarily become surpluses during periods of protracted outflows.

**Figure 1**
**Capital flows to emerging and mature economies, as a share of M2, 1990-2001**
(percentage)




*Source:* International Monetary Fund, *International Financial Statistics*, various issues, Washington, DC.
Notes: The bars refer to yearly data between 1990 and 2001. Emerging economies are Brazil (BRA), Indonesia (IND), Malaysia (MAL), Chile (CHI), Colombia (COL), Mexico (MEX), and Argentina (ARG). Developed economies are: Japan (JPN), Canada (CND), United States (US), and Switzerland (SWI).

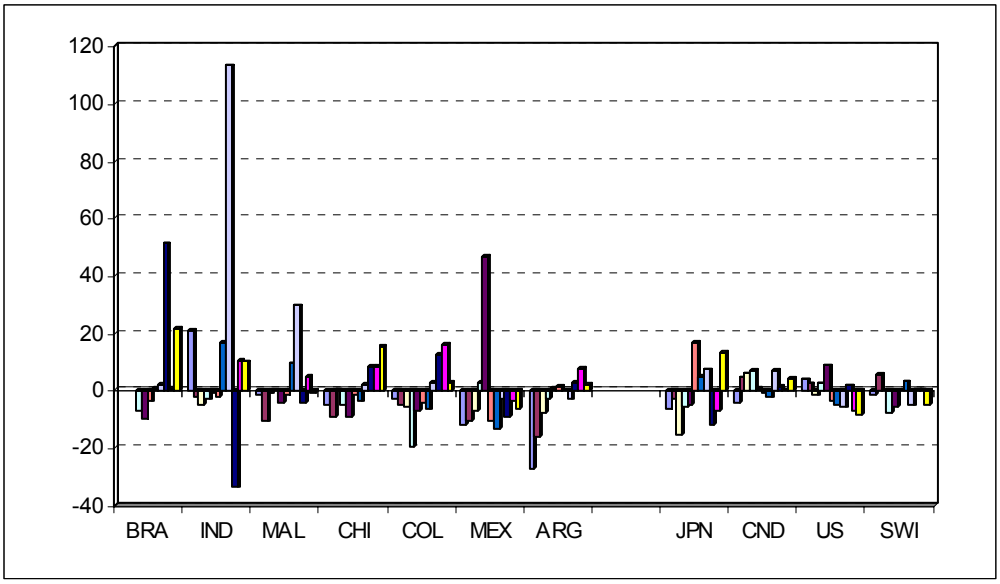
Since in developed countries capital flows are of a small order of magnitude relative to the size of their economies and financial markets, they can more easily adjust to changes the direction and size of flows and, therefore, most of them practice benign neglect of capital flows, inward or outward.

Developing countries, in contrast, cannot afford that luxury. In the absence of capital controls, during foreign-capital surges, countries that peg to a major currency experience an inflating money supply and real exchange-rate appreciation through higher prices for nontradables. Those that float their currency are visited by sharp nominal (and real) exchange appreciation. In both cases, export diversification and the capacity of domestic producers to compete with imports are threatened. During periods of capital outflows, the real exchange rate tends to depreciate, and it does so even more rapidly in

countries with floating exchange-rate regimes.[2] There tends to be overshooting in both directions.

The larger size and greater volatility of exchange rates[3] in developing countries than in developed ones is shown in figure 2, which shows annual changes in real exchange rates in 1991-2001 for the same sample of developing and developed countries included in figure 2. Exchange rate variations, in developing economies, tend to be closely associated with capital flows, inflows leading to sharp appreciations (negative values in figure 2, reflecting declines in the value of the dollar) and outflows to depreciations (bars with positive signs in figure 2).

**Figure 2**
**Selected developed and developing countries: Annual real exchange rate variation, 1991-2001**
(percentage)




*Source:* International Monetary Fund, International Financial Statistics, various issues.
Note: The country designations are as in figure 1. The bars refer to yearly data between 1990 and 2001. For developed countries, real exchange rates are the inverse of the real effective exchange-rate index, as reported by IMF in International Financial Statistics. For developing countries, the real exchange rate is defined as the price of the dollar in domestic currency, deflated by the consumer price index, multiplied by the wholesale price index for industrial producer goods in the United States. The Brazilian series begins in 1994. While admittedly crude, the index for developing countries gives an order of magnitude of real exchange rate changes that conforms to expectations and that is inversely correlated to direction of capital flows.

[2] There is an asymmetry between inflows and outflows. Whereas a country can maintain a peg indefinitely during periods of inflows by accumulating reserves, when outflows are severe, floating is inevitable, because reserves are depleted and the country loses access to capital markets. IMF finance, which is supposed to provide a cushion, has proved to be very skimpy.
[3] The exchange rate is defined as units of domestic currency per unit of foreign currency.

## III. All you ever wanted to know about capital flows: two paradigms

The two opposite paradigms developed for understanding capital flows to emerging markets – the conventional, or "Wall Street", paradigm (favoring unrestricted capital-account liberalization) and the "neostructuralist" paradigm, favoring policies to regulate capital flows – differ mainly in the way they see the workings of the economy. A schematic presentation of their main points of divergence is shown in table 2.

**Table 2. The two paradigms**

| | Wall Street | Neostructuralist |
|---|---|---|
| **Nature of the economy** | Flexible wages and prices; full set of markets; high employment output maintained; classical dichotomy of monetary and real variables | Markets don't clear; constrained equilibria; variable unemployment; undeveloped financial markets; monetary variables affect real outcomes |
| **Nature of international capital markets** | Capital flows are the product of rational decisions made with complete information (or behave "as if") | Asset decisions made on the basis of incomplete information; herd behavior; contagion in both directions |
| **Causes of capital flows** | | |
| Changes in "expected" flows | Changes in country risk premium | No such thing as "normal" or "expected" inflows |
| "Excessive" inflows | Tight monetary policy and/or lax fiscal policy, which raise domestic interest rates | Exogenous to country, though aggravated by policy (e.g., liberalization of capital account, procyclical fiscal and exchange rate policies) |
| "Excessive" outflows | Chronic fiscal deficits | Consequences of excessive inflows |
| **Effects** | | |
| Inflows | Exchange rate appreciation; increase in aggregate output; shift of resources to non-tradables | Overshooting exchange rate appreciation; unsustainable increases in output, employment and wages; asset price boom; shift of resources to non-tradables; increase in output, but fall in exports; rapidly rising current account deficit |
| Outflows | Exchange rate depreciation; fall in high-employment output; high employment maintained; shift of resources to tradables | Overshooting exchange rate depreciation; fall in investment, consumption, output, employment, and real wages; no increase in output of tradables; banking and fiscal crises; asset price crashes |
| **Policies required** | | |
| Excessive inflows | Tighten fiscal policy; relax monetary policy | Tax capital inflows; accumulate foreign assets for bad times |
| Excessive outflows | Correct persistent fiscal deficit; raise domestic interest rates; allow strong depreciation | Outflows less likely to be excessive, if previous inflows were not; avoid high interest rates and maintain credit lines; exchange controls to avoid overshooting |

The Wall Street view (which is behind much conventional policy advice) tends to think of the economy as a textbook case of complete markets, rapidly adjusting prices, and the classical dichotomy (i.e., monetary variables do not have a lasting influence on real variables). The neostructuralist view stresses the existence of incomplete markets in developing countries (particularly in the financial sector), slow and incomplete adjustment toward equilibrium, and protracted real effects for changes in monetary variables (particularly, the nominal exchange rate).

The Wall Street paradigm concludes that capital flows are largely benign and that any pathology that may be observed is due exclusively to poor domestic policies in recipient countries. Large inflows could be the transitional manifestation of a change in the desired stocks of national assets held by both national and foreign wealth holders. A complementary explanation for large inflows is that they persist because domestic interest rates are above risk-adjusted international rates, and this can happen in situations where monetary policy is too tight or the fiscal stance too lax.[4]

Financial crashes are almost always ascribed to chronic fiscal deficits, which raise the country's risk premium. The conventional policy prescription in these cases is simply to get your house in order: correct the deficit and foreign investors should be (eventually) willing to return. Governments of countries experiencing capital flight are also advised to raise short-term interest rates sharply in order to moderate capital outflows and to allow the domestic currency to depreciate. In particular, governments should not stubbornly hold on to a peg that is patently indefensible.[5]

The neostructuralist paradigm, in contrast, stresses that capital flows can be destabilizing and, therefore, that developing countries that are beginning to integrate their financial sectors into international capital markets should do so carefully. There is no such thing as "equilibrium" capital flows that respond to a known "hard" risk premium. Capital flows occur because of a variety of factors. They are almost always the result of changes in the humors of foreign portfolio investors and international banks, although poor policy can exacerbate both inflows and outflows. But good policy is more than conventional macroeconomic prudence (which is undoubtedly necessary). It also relates to a coherent and properly implemented policy toward financial integration with the rest of the world, so as to allow the country the freedom to keep aggregate demand at levels close to potential output.

Inflows are large relative to the size of embryonic and poorly regulated domestic capital markets (factors characteristic of low levels of development). Moreover, even in the best of circumstances, policy makers have difficulty managing the domestic impact of inflows, given the limited tools available to them and the large magnitudes involved. For

[4] This is of course a simplification. There are more sophisticated versions of the conventional paradigm that would blame poor banking regulation or crony capitalism (the connivance between government, banks, and nonbank private final users of foreign credit) for excessive indebtedness and subsequent crashes (see Eichengreen, 1999, for a description of the various theories explaining financial crises).

[5] In this respect, there are differences of opinion among conventional analyses. Some argue for abandoning the domestic currency in favor of a hard currency, while others recommend floating.

example, experience shows that it is difficult to sterilize the monetary impacts of capital inflows and to prevent the real exchange rate from appreciating sharply.

Action to dampen inflows is usually resisted by the business community and even by policymakers themselves, because episodes of large inflows are perceived as being benign: there is a domestic boom, unemployment declines, asset prices rise. Nobody wants to stop a good thing, which, for all intents and purposes appears to be permanent (perhaps a reward for good behavior or for having undertaken difficult, market-oriented reforms).

Regardless of how benign the inflows appear to be, sooner or later heavy inflows alter the economy's macroeconomic prices and aggregates and sow the seeds for the ensuing capital outflows. Because inflows are large and difficult to sterilize, they set off both increases in the monetary aggregates and a boom in asset prices. The current-account deficit bulges, and the exchange rate appreciates in real terms, typically overshooting its (even appreciated) equilibrium. At some point, foreign portfolio investors decide the current-account deficit is too large or that it has been too large for too long or that the exchange rate has appreciated beyond any reasonable degree (as in Thailand in mid-1997). As it becomes more difficult to finance current-account deficits, international reserves stop increasing and begin to decline. As the situation of the country begins to look much worse than had been expected, panic takes hold of foreign financial asset holders, and domestic asset sales accelerate. Money center banks don't renew expiring credit lines and call in loans. Large capital outflows ensue. Experience shows that this can happen in cases of prudent public sector behavior, and where, therefore, the counterpart of current-account deficits is in the private sector (e.g., Korea and Chile).

Contagion mechanisms, which are another manifestation of the exogeneity of capital flows, spread the crisis from originating countries to others. Contagion can be subjective or objective. Subjective contagion is the stampede of investors in economies other than the one originally hit by the crisis who run simply because other investors do. For example, investors in assets denominated in Korean won panicked because they assumed, after investors in Thailand started to run, that Korea was next. Objective contagion is the result of the behavior of institutional investors—whether hedge funds or mutual funds—who, when faced with losses in one market, sell still-good assets of another country in order to meet margin calls or recoup losses.

During the early 1990s, reforms perceived favorably by investors, together with low returns on financial investments in major markets, led to a capital surge to emerging economies. On the eve of the Asian financial crisis in mid-1997, several recipients of inflows in Asia and Latin America were beginning to experience the symptoms of changed fundamentals described above. When the crisis erupted in perhaps the most vulnerable country (Thailand), the crisis spread through contagion to many other countries, some of which exhibited vulnerabilities, but many of which did not.

Several episodes of contagion have occurred since the late 1990s. The first one was the Asian crisis, which engulfed practically all emerging markets in Asia, including countries with solid fundamentals, such as Singapore, Hong Kong, and Korea. The Russian crisis of mid-1998 affected even countries with no economic ties to Russia, such as Brazil. In turn, the Brazilian crisis of late 1998 and early 1999 had strong knock-on effects on other Latin American countries.

## IV. Alice in Wonderland (or a benchmark classical model)

Using as a point of departure the benchmark classical model (Macroeconomics 101), by dropping its key assumptions one by one, it is possible to arrive at a reasonable analysis of the behavior and effects of capital flows on recipient countries. The benchmark model consists of seven equations that describe an economy with three markets: a goods market, a money market, and a market for foreign money. To simplify the analysis, all variables are expressed in real terms. Markets clear and long-term equilibrium occurs at high employment (say, for example, at the natural rate of unemployment).

Equilibrium in the goods market is just the IS curve of standard macroeconomics, where total saving (foreign and domestic) must equal desired investment. The money market is in equilibrium when the supply of money, *m*, equals desired money holdings, which depend on income and the interest rate (the LM curve). The balance of payments is in equilibrium when desired capital inflows (which depend on the difference between domestic and risk-adjusted international interest rates) are exactly equal to the desired current-account deficit at current levels of income and the exchange rate. This is the BP curve. Finally, the interest rate parity condition, which stipulates that the domestic interest rate must equal the risk-adjusted international rate, must hold. That we are dealing with a small country that does not affect international interest rates implies that the BP curve is horizontal at a level where the domestic interest rate is equal to the international rate plus the risk premium.

In schematic form, the model is as follows:

$$S_p[Y - T(Y)] + [T(Y) - G] + [M(Y,\varepsilon) - X(\varepsilon)] = I(r) \quad (1)$$

$$m = L(r, Y) \quad (2)$$

$$F(r) = M(Y,\varepsilon) - X(\varepsilon) + \Delta R \quad (3)$$

$$r = r^* + \rho + dE[\varepsilon] \quad (4)$$

$$R_t = R_{t-1} + \Delta R \quad (5)$$

where,

$S_p$ = personal saving
$Y$ = aggregate income
$I$ = gross investment
$T$ = tax revenue
$G$ = government expenditure
$M$ = exports
$X$ = imports

$F$ = capital inflows, equal to the current account deficit ($M$-$X$)
$m$ = real money supply (M/P), where P is the price level
$L$ = demand for real money balances
$r$, $r^*$ = domestic, international interest rates
$\varepsilon$ = real exchange rate (pesos per dollar)
$\rho$ = country risk premium
$E[\varepsilon]$ = expected real exchange rate
R = international reserves
$\Delta$R = increase in international reserves

One can solve the model by imposing the condition that, in equilibrium, income is at its high employment level ($Y=Y_h$) and international reserves are in steady state ($R_t = R_{t-1}$). In effect, then, in equation (5), capital inflows would simply be equal to the current-account deficit. Since (in this model) expectations of exchange-rate depreciation are nil in the absence of real shocks to the economy, the interest rate parity condition boils down to equating the domestic interest rate with the international rate plus the country risk premium, $\rho$, which reflects the lower quality of domestic assets relative to those of international capital market centers ($r = r^* + \rho$). The parameter $\rho$ reflects hard facts about the domestic economy that are well-known to investors. This solution is depicted in figure 3 by equilibrium at $(Y_h)_0$.

Now, to account for growth, consider a simple growth model à la Solow. Together with the law of capital accumulation, one obtains two additional equations:

$$Y_h = \left(Le^{(n+\lambda)t}\right)^{\alpha} K^{1-\alpha} \qquad (6)$$

$$K_t = (1-\delta)K_{t-1} + I \qquad (7)$$

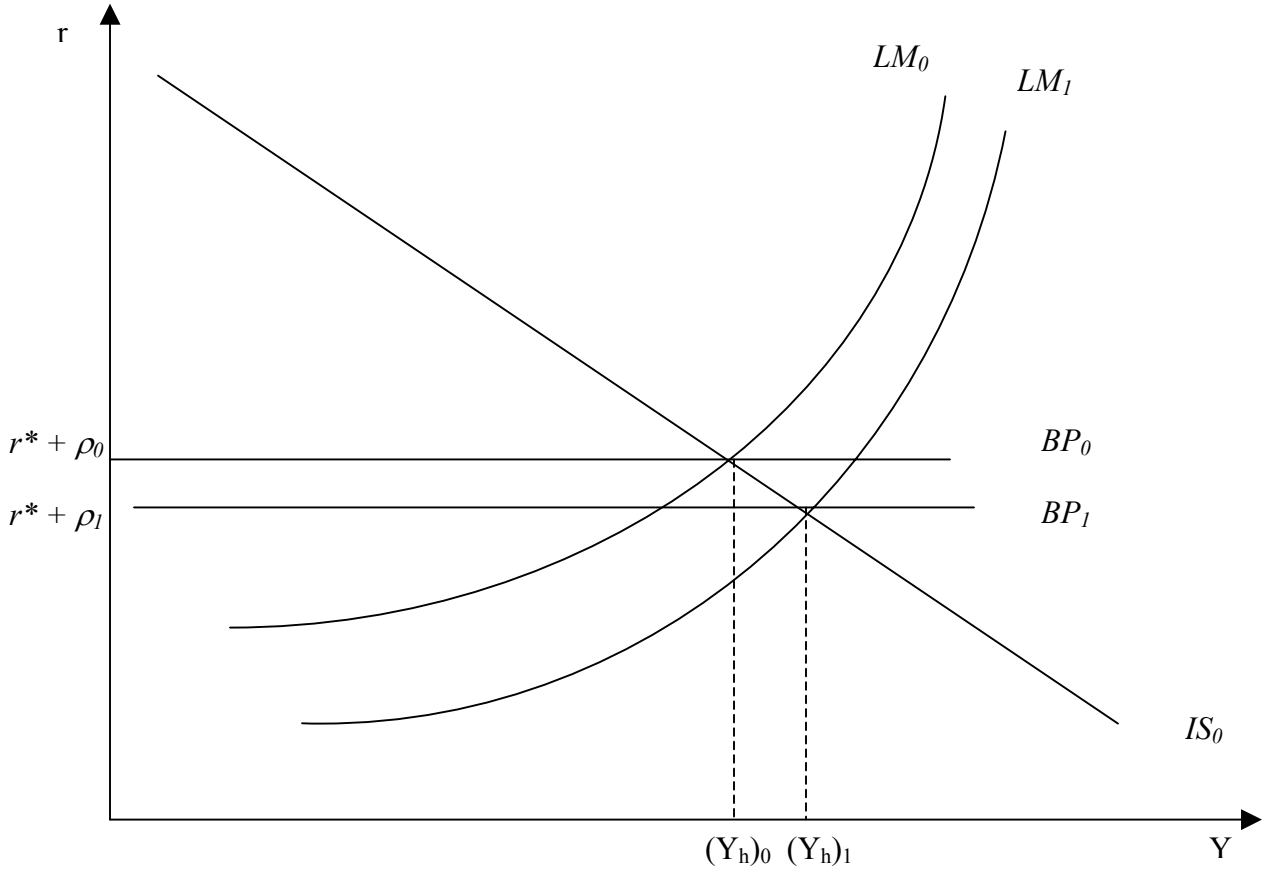
where
n = annual rate of growth of the labor force (exogenous)
$\lambda$ = annual rate of labor productivity increase (exogenous)
$L$ = labor force
$K$ = capital stock
$\delta$ = depreciation rate

In this model, capital inflows would increase only as a result of a decline in the country risk premium ($\rho$) or in the international interest rate (r*). To simplify, assume that the cause is a decline in $\rho$ because the country in question is instituting market-oriented reforms. The effects will be a fall in the domestic interest rate, an appreciation in the real exchange rate, and a one-time increase in reserves and the money supply.[6] In this case, the BP line shifts downward, and the real money supply rises, shifting the LM curve outward. But the exchange rate appreciates, which should shift the IS curve downward. However, investment also rises with capital inflow. It is not possible to determine a priori

[6] The real exchange rate appreciation will occur regardless of whether the economy is on a floating or fixed nominal exchange rate regime. The supply of foreign exchange will rise relative to the demand, and its real price (pesos per dollar) must fall. Similarly, in this model the money supply will rise as a consequence of the increase in reserves.

which effect dominates. Let us assume that the two effects cancel each other out and that the IS curve stays put. But $Y_h$ will unambiguously move to the right because investment is higher than before the capital inflow (see figure 3). In fact, since output is at its high-employment level, the only way for output to rise is through the additional capital accumulation brought about by the capital inflow.

**Figure 3**
**Effects of capital inflow in the benchmark classical model**




What are the real results of capital inflows, then? Aggregate output is higher, and the composition of output shifts to nontradables. Since there is no reason to be concerned about the composition of output, the main effect of capital inflows appears to be beneficial and takes the form of an increase in steady-state output. In addition, the model does not distinguish between different forms of capital inflow (direct investment, portfolio investment, bank loans, or whatever), which by assumption all wind up having the same effect: an increase in investment.

If capital inflows are in excess of what the model predicts, and the exchange rate appreciates too much, the reason must be that fiscal policy is too loose (raising domestic interest rates above the interest rate parity condition) or that monetary policy is too tight. But these are transitory phenomena that are eventually corrected by appropriate price changes. Once the authorities straighten out their policy mix, capital inflows should be just sufficient to finance the equilibrium current-account deficit.

Exactly the opposite is the case when capital flows decline. Their fall must be attributed to a rise in r* (tighter money or looser fiscal policy in capital market centers) or in ρ (fiscal deficits in the borrowing country that go uncorrected for too long or a backsliding on reforms). The effects are symmetrical to those analyzed for capital inflows: the domestic interest rate rises, the exchange rate depreciates, the composition of output shifts toward tradables, and steady-state output falls. Again, there is no need to develop an explicit policy toward capital outflows. To get back inflows to their former level, policymakers need to correct the deterioration in the fundamentals that resulted in a rise in the risk premium. If capital outflows continue unabated, it must be because the domestic policy environment (such as large fiscal deficits) continues to deteriorate. To staunch the flow, policy makers must address the underlying causes. Raising interest rates temporarily and validating market expectations of real exchange-rate depreciation (instead of persisting in defending last year's equilibrium or a peg out of line with fundamentals) can facilitate adjustment to the new equilibrium.

## V. How the real world works

Reality is considerably more complex and interesting. Capital inflows have been shown to induce powerful (if unsustainable) increases in real incomes, and outflows have led to deep and long depressions (Indonesia and Argentina are the prime examples). In less dramatic extremes, they have been the main factor behind sharp but less durable recessions (Korea in 1997-1998) or protracted growth slumps (Chile from 1998 to 2003).

### A. Modifying the assumptions

Let us then proceed to modify the model in some of its key assumptions.

**Does output settles at its high-employment level?** Output usually settles far short of its high-employment level, and the forces that might take it there are weak. This is more likely to happen in a developing economy than in a developed one for a variety of reasons. These include mismatches in supply and demand for skills, which can be corrected only in the very long run and with considerable investment; sector-specific physical capital; geographic barriers; and financial constraints to factor mobility. Any change in relative factor prices, say in the real exchange rate, will therefore lead to slow adjustment. Adjustment to depreciation, which should encourage the production of tradables, is likely to be more difficult than adjustment to appreciation, which stimulates nontradables and imports (financed with the capital inflows that are responsible for the appreciation). This is because the technology and skill requirements of tradable

production, particularly those of goods that are not produced in the domestic economy, are very difficult to meet.

**Is output demand determined?** Output may also settle far short of its high-employment level because of insufficient aggregate demand (see Dutt and Ros, 2005). This means that the higher aggregate demand associated with capital inflows and with the ensuing asset price booms will affect output not only through increased investment but primarily through rising consumption. In fact, the form that capital inflows takes will be crucial in determining which component of aggregate demand rises. When inflows are mainly greenfield foreign direct investment (i.e., investments in new facilities), aggregate investment will increase. But when inflows go into the stock market or take the form of bank loans channeled to the real estate sector (as in the Thai experience before 1997), wealth effects will stimulate consumption rather than investment. Furthermore, experience shows that currency appreciation gives a strong boost to consumption, as real wages rise (because of the fall in relative consumer prices).

**Does a stable, fundamentals-determined, risk premium exist?** The benchmark model assumes a fairly constant or slow-changing country risk premium that responds to variables that change slowly and are known with certainty by all market participants. But the country risk premium is not a hard fact. It depends on market participants' assessments about the future course of an economy and policy making. Experience has shown that these perceptions can be very volatile and that they have only a tenuous relationship to the quality of policy making or long-term growth prospects. Country risk premiums (as measured, say, by the spread of country debt over U.S. Treasuries) have been observed to change markedly and to follow swings. For example, the spread on Brazilian debt rose consistently from the time the election polls indicated that Lula had a high probability of winning the presidential election but began a sharp downward course almost immediately after his election—and, by mid-2003, had reached levels that were lower than before the steep preelection climb. The spread on Turkish debt fell dramatically during the first quarter of 2003, apparently because markets considered the new government to be stronger than the outgoing one, despite little having been done to contain not only a high level of public debt but also a ratio of debt service to tax revenue that was around 90%.

**Do changes in the risk premium determine changes in capital flows?** Changes in the direction of capital flows are not necessarily reflected in country risk premiums on government debt. For example, recent declines in capital flows have been accompanied by stable or even lower risk premiums in some countries. In Chile, the sovereign risk spread has remained fairly stable, but FDI has fallen from over 7% of GDP in 1997 to about 1% in 2000, and foreign investment in the Chilean stock market disappeared, not returning until the upswing of 2003 was underway. Likewise, in Central America, there has been an improvement in access to international public-debt markets (and falling spreads), but capital flows generally have declined.

**Capital flows are not homogeneous.** There are different kinds of capital flows, and the agents behind them are different. Generally, one can speak of five kinds of flows: FDI; portfolio investment in stocks and bonds; international bank lending; and, in some countries that still qualify, concessional loans and grants. The motivations of agents who carry out these transactions vary greatly. Bank lending is the only transaction that arbitrages risk-adjusted interest rates. This distinction is crucial for policy making. At one end of the spectrum, greenfield FDI flows tend to have long horizons and are unlikely to respond to changes in interest rates.[7] At the other, short-term bank lending and portfolio investment have a speculative element that renders them volatile, herdlike, and particularly prone to reversals.[8] The distinction between agents behind capital flows has a corollary: a varying fraction of capital inflows winds up as real investment. And even FDI does not always crowd in domestic investment, especially in the short term (Agosin and Machado, 2005).

**What determines real exchange rates?** The benchmark model also assumes that expectations of changes in the real exchange rate are based only on fundamentals. But, as noted above, the conventional model assumes a fundamentals-determined real exchange rate; in other words, in the absence of external shocks (e.g., terms of trade changes), $dE[\varepsilon] = 0$. Reality shows that real exchange rate expectations are also subject to humors. In fact, they are an integral part of the mechanism that amplifies the effects of capital surges or capital flight. When capital inflows are large and expected to continue, market participants also expect appreciation. Thus, everybody sells foreign currency and buys domestic currency (for simplicity, labeled "the peso"). Domestic asset holders behave the same way as foreigners. The domestic currency is likely to become excessively appreciated—until the mood turns. During episodes of capital flight, the generalized expectation is that the peso will depreciate; thus, foreigners and nationals alike sell it. The result is overshooting in the other direction.

### B. What happens during capital inflow episodes?

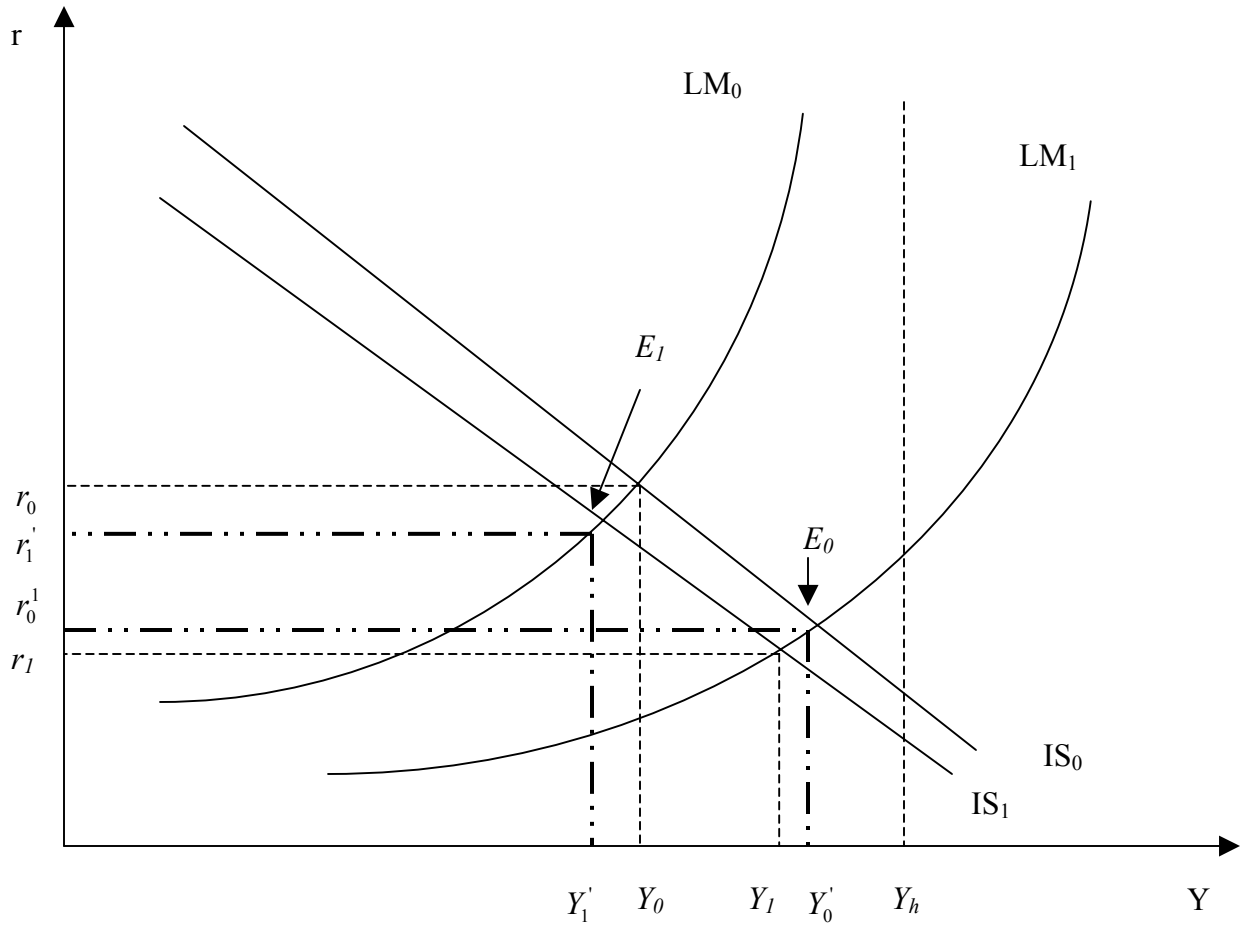
The analytics of capital inflows can be traced with the help of figure 4, which like figure 3, depicts a standard Mundell-Fleming macroeconomic model but does not assume that output is at its long-run equilibrium of $Y_h$. In fact, in keeping with the neostructuralist paradigm, it is assumed that the normal state of affairs is for output to settle below $Y_h$, for both supply and demand reasons. In addition, the figure drops the assumption of a well-behaved country risk premium, ρ. Thus, domestic interest rates are no longer in lockstep with international rates. Although the domestic interest rate has a floor (which is above international rates), the spread between it and the relevant international rate can be extremely variable.

[7] However, multinationals with access to international capital markets and deep pockets are certainly able to take advantage of short-term currency and interest-rate arbitrage possibilities.

[8] The conventional definition of FDI includes both Greenfield investments and purchases of existing assets. Recent years have witnessed a spectacular rise in FDI of existing-asset purchases, which are more akin to portfolio investments by large multinational holding companies. They are, of course, more difficult to dispose of than small sharehodings.

Capital inflows can be set off by many causes. For example, portfolio investors can come to believe that a given country has introduced fundamental, market-oriented, reforms. These beliefs often result in a lowering of the country risk premium, which, in turn, can elicit sharp increases in capital inflows, which, as we have seen, can be very large relative to the size of recipients' financial markets. These inflows are extremely difficult to sterilize completely, partially owing to the fact that they require central banks to incur in large quasi fiscal deficits. As a result of the heavy inflows, the economy experiences a boom, liquidity constraints are relaxed, and asset prices rise. The big boost in demand is in the nontradable segments of the economy (real estate, commerce, finance). Although the production of tradables is discouraged by exchange-rate appreciation, real income and employment rise.

**Figure 4**
**Effects of capital inflows in the neostructuralist paradigm**




There are amplifying mechanisms that determine a positive feedback loop that takes the economy away from equilibrium. The boom is often amplified by enhanced expectations of exchange-rate appreciation, which result in asset substitution in favor of

the domestic currency, amplifying the appreciation of the exchange rate, making importable consumer goods even cheaper, and giving a further boost to real incomes.

Another amplifying mechanism is the way fiscal policy operates in most developing countries. Fiscal policy is endogenously procyclical rather than anticyclical (see Braun and Di Gresia, 2003). Automatic stabilizers, such as unemployment insurance and progressive income taxation, are weak or absent. Moreover, during periods of bonanza, there are strong pressures to increase spending. And the capacity of the government to spend is enhanced by larger tax revenues. As the domestic currency appreciates and international interest rates available for the country decline, debt servicing declines as a proportion of tax revenue, leaving more resources available for spending.

Figure 4 presents a modified version of the benchmark model in which the economy is out of long-term equilibrium (aggregate supply is below high employment income, $Y_h$, to start out with, and there are no forces taking it there). In terms of this model, capital inflows raise the real supply of money more than its demand.[9] The LM curve is displaced downwards, and exports and import substitutes are discouraged through currency appreciation.. Since only a fraction of capital inflows takes the form of real investment (and even that fraction may crowd out a certain amount of domestic investment), the depressing effects of currency appreciation on exports and importables may well outweigh the positive impact of inflows on investment, shifting the IS curve downward. However, the government is flush with tax revenue, encouraging it to increase expenditures (which counteracts the dampening effects of lower production of tradables and the downward shift in the IS curve). In the end, aggregate income rises toward high-employment income. The boom can be steep, and it lasts while net capital flows remain positive.

### C. And what happens during capital flight?

But this is not the end of the story. As noted above, currency appreciation, mounting debt, sagging exports, and eventually slackening growth may cause financial investors to reassess their good rating of a country. As investors and banks first fail to roll over debt coming due or stop making net purchases of other domestic assets, foreign-exchange reserves fall, firms and consumers begin to cut back on expenditures, and the negative expectations of financial investors are validated.

Expectations of real exchange rate depreciation amplify the positive feedback loop, since domestic asset holders dump the domestic currency in favor of dollars. Fiscal policy, the other amplifying mechanism, also contributes to the decline in activity. As the government loses its capacity for taking on new debt, expenditures must be cut. Currency depreciation and increases in international interest rates cut into the public resources available for spending, so that the collapse of government spending further amplifies the downward spiral. The end result is a sharp contraction of economic activity.

[9] The demand for money also increases. That is the essence of asset substitution.

The economy can get stuck in a low-income quasi equilibrium, which can also be depicted with the aid of figure 4. Imagine the original, post-inflow equilibrium at $E_0$, at the intersection of $IS_0$ and $LM_0$, with aggregate output represented by $Y_0^{'}$ and the real interest rate by $r_0^{'}$. As a consequence of capital outflows, the BP and LM curve shift upward; the IS curve shifts downward as investment, consumption, and public spending collapse; and the new equilibrium is at a much higher domestic interest rate ($r_1^{'}$) and considerably lower output ($Y_1^{'}$). Although the exchange rate has depreciated, this does not generate new exports (or production of import substitutes) because the banking sector has been crippled and is unable to extend credit. International credit lines to domestic banks and exporters are also shut down. Therefore, the depreciation is ineffective in raising aggregate demand and shifting upward the IS curve. Monetary policy is impotent, since any increase in money supply translates into higher, unsatisfied, demand for foreign currency, and reserves are effectively exhausted. Income shrinks and unemployment soars.

## VI. Policy conclusions

Capital flows can produce great upheavals in countries that are beginning to integrate into international capital markets. Policies toward capital flows are an integral part of good macroeconomic management and must address the prospects of large and destabilizing inflows and large outflows. But governments can do more to ensure that capital flows contribute to development.

### A. A case for managing capital flows

The experiences of some countries (e.g., Chile, Colombia, Malaysia, China, and Taiwan) indicate that a wide variety of unorthodox policies designed to deal with excessive inflows and outflows cause minimal distortions and can be successful. These policies run the gamut from variable taxes on capital inflows to outright controls. Success with such policies does not, however, validate the use of just any kind of controls. In some countries, controls have been abused and even used as a vehicle for corruption. Yet the negative experiences of some countries should not lead to the opposite, also erroneous, conclusion that controls can never work, for experience belies such a proposition.

Variable taxes on inflows (the rate depending on the strength of the surge) can be implemented directly or can take the form of unremunerated reserve requirements (URR) for a fixed period. The advantage of URR, used by Chile until capital flows vanished in 1998 and by Colombia, is that they can be imposed directly by the central bank and do not require legislation. URR are particularly onerous for short-term round tripping that seeks to take advantage of temporary interest-rate differentials or stock-market plays, but they have practically no effects on long-term flow (see Agosin and Ffrench-Davis, 2001, annex, for a calculation of the impact of URR on the cost of borrowing at different maturities). Chile and Colombia show that URR can be effective in dampening total

inflows and in changing the composition of inflows away from the short term during periods of heavy demand for the domestic currency.[10]

Other countries have effectively used direct controls, either on inflows or outflows. Malaysia, for example, used capital controls to protect its domestic economy from capital flight during the Asian crisis.[11] China has a tightly controlled capital account. And Taiwan was in the process of cautiously liberalizing its capital account when the Asian crisis hit. The direct interference of its central bank with capital inflows and outflows was useful in preventing the violent swings in aggregate demand and output that occurred in Asian countries such as Indonesia and Korea, which had adopted a much more liberal approach to capital flows (see Agosin, 2001, for a detailed comparison of Taiwan and Korea).

### B. Exchange-rate policy: the empty extremes

There has been a debate about whether developing countries should continue to manage exchange rates or opt for one of two extreme regimes: a free float or a fixed peg (for different views, see Frankel, 1999; Velasco, 2000; Larraín and Velasco, 2001; Williamson, 2000; and Ffrench-Davis and Larraín, 2003). The new conventional wisdom, labeled the "empty middle," contends that the best exchange-rate regime is necessarily one of the two extremes, free floating or an ironclad commitment to a fixed parity. If, however, capital flows are exogenous and as large and volatile as I have argued in this paper, and if foreign-exchange markets are shallow in recipient countries, the conclusion differs: what is empty is not the middle but the extremes.

In circumstances where it is difficult to sterilize capital inflows and where there is a flurry of amplifying asset substitution, a fixed exchange rate leads to wild swings in domestic activity, marked by an inflating economy during upswings and a depression during outflows. The real exchange rate appreciates sharply during inflows, since the prices of nontradables rise as a consequence of the expansion of liquidity. The appreciation not only reduces tradable production but also tends to destroy installed capacity and to discourage investment in tradables. But when the crisis hits, a real depreciation is harder to engineer with a fixed nominal rate because domestic prices and wages are sticky. The result is a depression in employment and output. Argentina's experience is paradigmatic of this corner "solution" and has shown how undesirable it can be.

[10] In the Chilean case, there has been a stormy debate on how effective URR have been (Agosin and Ffrench-Davis, 2001; Lefort and Lehmann, 2003; De Gregorio, Edwards, and Valdés, 2000). For an analysis of the Colombian case, see Cárdenas and Barrera (1997); Ocampo and Tovar (2003). Some claim that the effect of the URR has been only to change the composition of inflows but that they have not affected total flows. However, for this to be true, the URR, while discouraging short-term operations, would have had to *increase* long-term capital inflows. This is highly unlikely. Therefore, a decline in short-term flows should have led to a fall in total inflows as well.

[11] The Malaysian experience is described in Khor (2005).

Yet neither is the other corner, the free float, any better. With large and volatile capital flows, a flexible exchange rate regime without official intervention would result in even wilder swings in real exchange rates than with totally fixed rates, which would impart a good deal of noise to relative prices, discouraging investment and lowering growth. Such consequences may be a reason why even those central banks that claim to float intervene in foreign-exchange markets to prevent severe misalignments.

Thus the exchange rate conundrum is not so easily sidestepped. Dampening oscillations in capital flows would indeed make exchange-rate management easier. But policy makers are unlikely to be able to eliminate altogether the swings in capital flows, the exchange-rate regime becomes an important complement in reducing the amplitude of the capital-flow cycle and in moderating its consequences on the domestic economy. Some sort of band (perhaps with a crawl to take into account differential inflation) is likely to be superior to both a fixed peg or an unfettered float (see Williamson, 2005). In fact, by imparting some uncertainty about the future of the exchange rate, a band discourages some interest-rate arbitrage. Mistakes can be costly for currency-market players when the central bank does not offer complete exchange-rate cover for free.

Contrary to the current academic fad, there is no such thing as an optimal regime. The choice, more art than science, is likely to include a band with hard edges (to give certainty to long-term investors in tradables), bands that are sufficiently wide to allow for some flexibility but not so wide that they lose all meaning, and dirty floating within the band.

### C. Monetary policy during capital flight: a contrarian view

When faced with capital flight, should developing countries not only raise interest rates to encourage wealth holders to keep their assets in domestic currency but also allow the exchange rate to depreciate to wherever the market will take it? Furman and Stiglitz (1998) and Radelet and Sachs (1998) argue that such policies simply accelerate capital flight by pushing borrowing firms and domestic banks into bankruptcy; they are surely right.

In addition, tight money has adverse distributional effects. While the need for tight money arose in the first place because of excessive borrowing in foreign exchange by large firms and banks with access to international financial markets, the "cure" of high interest rates affects primarily those companies that do not have access to borrowing in foreign currency (mostly small and medium-size enterprises). Besides, by bankrupting many firms, tight money jeopardizes the banking system, which experiences a dramatic rise in nonperforming loans and declines in liquidity. This in turn causes banks to reduce their lending and call in loans.

The best policy is to avoid getting into such a rut, and this means discouraging excessive inflows. But, again, in a world of international capital volatility, even the best policy is unlikely to prevent crises altogether. Once a run on the currency gets underway, the only sensible thing to do is to call a halt by imposing capital controls and to seek an orderly way out of the mess. This ought to be accompanied by exchange-rate and interest-rate policies that avoid bankrupting solvent banks and profitable firms.

### D. Developing the tools for countercyclical fiscal policy

Governments find it very difficult to avoid spending during booms, and many emerging countries find that the temptation to increase their borrowing even in good times is strong, mainly because their creditworthiness improves during the upswing of the business cycle. To practice countercyclical fiscal policy, however, the public sector must generate a surplus during expansions. This will allow it to run a deficit during recessions and to counter the dampening effects on the economy of private-sector retrenchment.[12] The surplus generated during booms needs to be saved by increasing assets or diminishing liabilities. If assets are increased, they should preferably take the form of foreign-asset accumulation, since recessions are almost always caused or accompanied by capital flight, which can be stemmed if foreign assets have been accumulated during the boom. In addition, since the public sector would have lower debt ratios under this kind of policy, it would retain better access to international financial markets during recessions.

If governments can keep to it, a structural fiscal rule is beneficial. This rule – as applied in recent years, for example, by Chile – specifies that the budget must be balanced over the cycle.[13] The size of the permissible deficit in bad times (as tax revenues fall) would be contingent on the estimation of the high-employment fiscal balance.[14] Of course, this is feasible only if the central bank has sufficient reserves or access to foreign credit when times are bad. High levels of debt are likely to be particularly damaging during downturns, since borrowing is practically impossible. This is an argument for keeping foreign indebtedness low during good times.

In cases where cycles are produced by commodity price changes, the argument for commodity-stabilization funds has been well rehearsed in the literature. Suffice it to say that the argument is symmetric to the one made for an anti cyclical fiscal policy: when commodity prices rise, increases in government revenues and foreign exchange availability ought to be sterilized so they can be spent later to dampen the macroeconomic effects of the downswing in prices. If stabilization funds are to work as intended, they require disciplined governments that eschew the temptation to spend their surpluses during good times.

### E. Implications for banking supervision

Banks are key institutions in both the generation of a financial crisis and the amplification of its effects (see Goldstein, Kaminsky, and Reinhart, 2000; Kaminsky and Reinhart, 1996). Bank supervision should strive to prevent banks from holding net debtor positions in foreign currency. This, of course, is easier said than done. Regulators must take into account that some banks' assets may be denominated in foreign exchange only nominally. If loans in foreign currency are extended to producers of nontradables, the

[12] For a fuller exposition of this point, see Ocampo, 2002.

[13] In the case of Chile, the target adopted is a 1% structural surplus. There are methodological issues involved in the measurement of the surplus that have given rise to much debate.

[14] In other words, one would need to calculate the fiscal balance that would have resulted had the economy been close to full employment. This is the "structural" balance.

denomination of the loans will not solve the problem: borrowers may go bankrupt or default on their loans, and creditor banks will be unable to service their own foreign loans. Although not easy, the avoidance of net exposures in foreign currency in the banking sector has been achieved in some countries with sophisticated regulatory environments.

The rules regarding provisioning against bad loans are also intimately bound up with whether the banking sector acts as a buffer or an amplifier of booms set off by capital inflows and of the ensuing busts that occur with capital flow reversals. During booms, all projects tend to look good, even those whose profitability across the cycle is lower than the interest rate on borrowed funds. Exactly the opposite occurs during capital-flow reversals: projects that are profitable in the long run tend to experience difficulties in servicing their debts when money markets tighten and demand falls, however temporary such phenomena may be. So, if provisioning rules aim not to amplify the effects of capital surges and cause unnecessary bankruptcies during capital flight, they should consider the profitability of projects financed through bank lending across the entire business cycle. This requires that provisioning constitute a higher ratio of total lending in developing than in developed countries. It also means that during booms there will have to be more provisioning, thus discouraging lending, and that during busts there should be less provisioning, encouraging lending.

### F. A new international financial architecture: reviving the discussion

Last but not least, the arguments developed in this paper have important implications for the redesign of the international financial architecture. The Asian crisis highlighted that international financial institutions are ill equipped to deal with the globalization of finance. The crisis also gave rise to a lively discussion in academic and policy circles.[15] Perhaps because of inaction, this discussion has lost momentum. Consequently, many interesting proposals have been left in limbo. The exogeneity of capital flows and the strong contagion effects to which financial markets are prone suggest that, in the absence of institutional reform and despite improved national policies to deal with capital flows, international financial crises will remain a fixture of the international economy. As shown in this paper, these crises tend to fall mostly on emerging economies and have protracted effects on their development process.

[15] See Eichengreen, 1999; Ocampo, 1999; Kenen, 2001; Ahluwalia, 2000; and Akyüz, 2000.

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