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Large Capital Flows: A Survey of the Causes, Consequences, and Policy Responses

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Abstract

This paper reviews the causes, consequences, and policy responses to large capital flows in several emerging markets. It opens by studying recent patterns of capital flows, and then discusses the causes of capital flows. Emphasis is given to the reasons behind the capital inflow episode in the 1990s, the major reversals, and the volatility observed in these flows. The paper goes on to examine the consequences of capital inflows and the pros and cons of alternative policy responses. It concludes with policy lessons derived from country experiences.

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I. INTRODUCTION

After the debt crisis of 1982-89, significant flows of financial capital returned to many developing countries. Although the experiences of countries varied considerably in the timing, duration, size, and composition of the surge, in all cases the inflows reflected both domestic and external factors. The former included improved economic performance and structural reforms in recipient countries, whereas the latter involved cyclical movements in interest rates in industrial countries and portfolio shifts by institutional investors toward emerging markets.

The heightened interest of investors in developing countries has led to increased financial integration, with benefits for individual countries and the global economy. In developing countries, financial integration boosts growth by increasing investment and consumption. It also reduces the volatility of consumption by augmenting the opportunities for risk diversification and by allowing international borrowing to offset temporary declines in income.

However, large capital inflows are not an unmitigated blessing. They can lead to rapid monetary expansion, inflationary pressures, real exchange rate appreciation, risks to the financial sector, and widening current account deficits. In addition, as the experiences of Mexico in 1994-95, Asia in 1997, and Russia in 1998 have shown, financial integration can lead to greater volatility and, eventually, to large reversals of the inflows because of changes in expected asset returns, investor herding, and contagion effects.

The macroeconomic challenges, triggered by the surge in capital flows, have given rise to a large literature discussing the appropriate policy responses — how to prevent overheating, limit vulnerability to large reversal of capital flows, and more generally, how to design macroeconomic policy coherent with increasing integration. To address these problems policymakers have used countercyclical and structural policies, as well as other measures designed to reduce net capital inflows. Countercyclical measures include tight monetary and fiscal policies and greater flexibility in the exchange rate regime, whereas structural policies consist of trade liberalization and banking supervision and regulation. Restrictions on gross inflows and encouragement of gross outflows have been the policies used to reduce net capital inflows.

This paper summarizes what is currently known about the causes, consequences, and appropriate policy responses to large capital flows. It is divided into six sections. Section II describes the main characteristics of the capital inflows of the 1990s and points out differences and similarities with that observed in the 1970s. Sections III and IV review the literature on causes and consequences of capital flows. Section V describes and evaluates policy responses undertaken by recipient countries. The final section presents lessons learned from recent experiences.

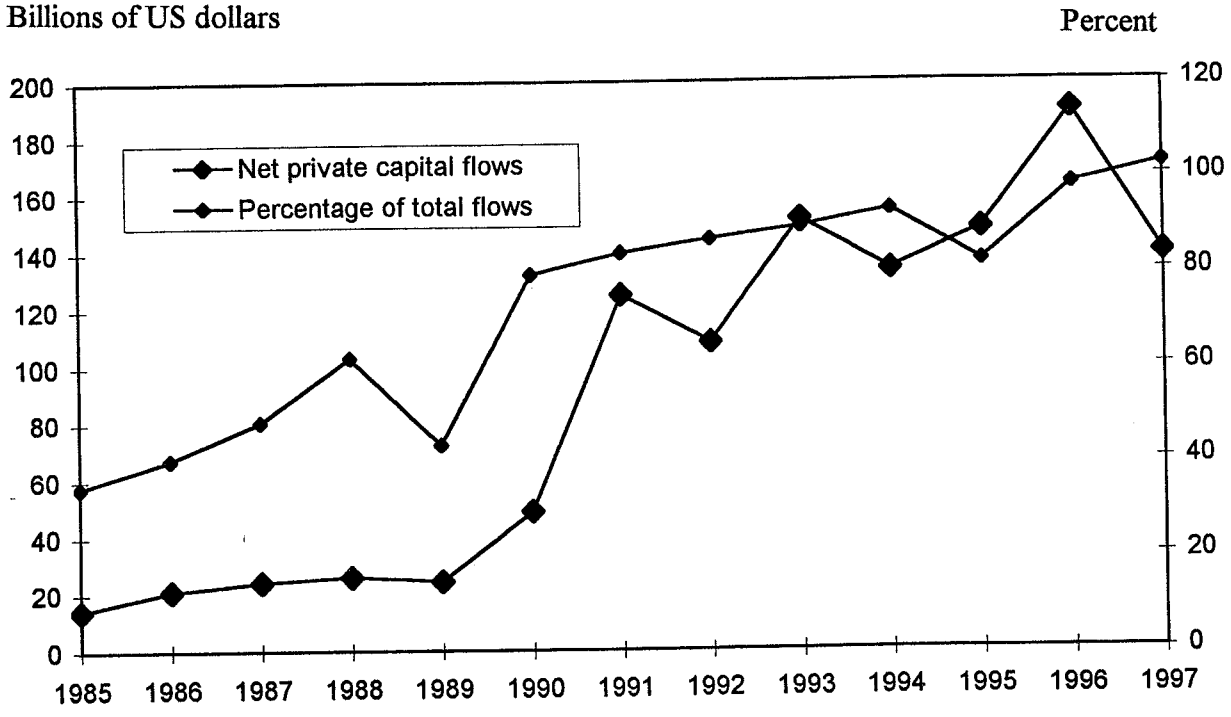
II. Capital Flows in the 1990s

What were the main characteristics of capital flows to developing countries in the 1990s? This section discusses their magnitude, regional destination and reversibility, asset composition, and sectoral destination. It also examines the composition of capital inflows from the stand point of desirability and, by focusing on the cost of financing to the recipient countries, explains why that composition has varied across regions.

A. Magnitude, Regional Destination, and Reversibility of Capital Flows

During the 1990s, net capital flows to developing countries increased markedly. In 1996 net private capital flows were $190 billion, almost four times larger than they were in 1990. These flows now account for more than 100 percent of total flows, whereas at the end of the 1980s they represented less than 50 percent (Figure 1). In the eight-year period 1990-97, net private capital inflows have also been larger than those preceding the 1982 debt crisis, both in absolute terms and as a proportion of exports or national product (Table 1).

Figure 1. Private Capital Flows to Developing Countries, 1985–97



Source: IMF, *World Economic Outlook* data base.

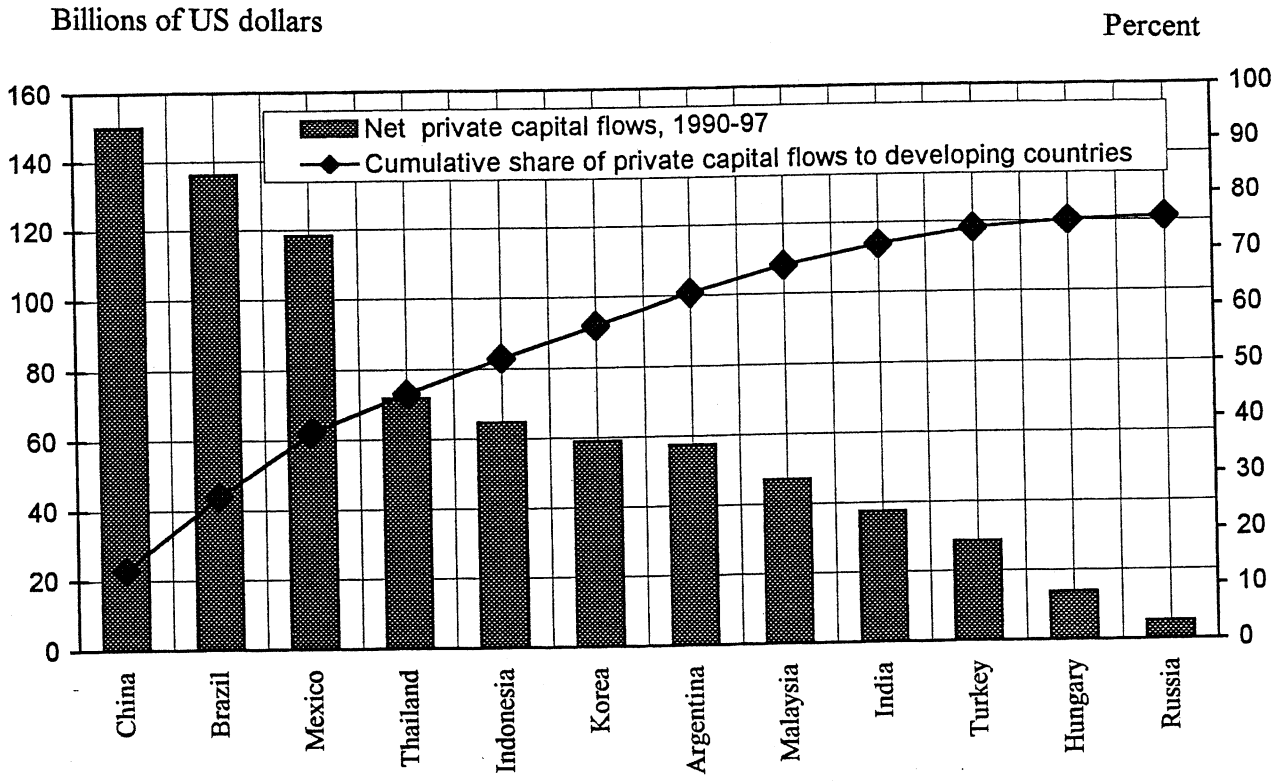
Table 1. Annual Net Private Capital Flows (By Region)

		1978-82	1983-89	1990	1991	1992	1993	1994	1995	1996	1997	1990-97
All Developing Countries	US$ Billions	18.3	17.2	48.9	124.8	108.2	151.4	133.4	147.6	189.6	139.0	130.4
	% Exports	3.9	3.7	7.4	18.6	14.7	19.7	15.3	14.3	16.4	11.1	14.7
	% GNP	0.8	0.7	1.6	3.9	3.1	3.9	3.3	3.2	3.7	2.5	3.1
Africa	US$ Billions	6.4	2.6	-1.9	1.2	0.2	3.7	9.2	10.5	5.4	14.0	5.3
	% Exports	7.7	3.2	-1.8	1.2	0.2	3.8	9.1	8.9	4.1	10.3	4.5
	% GNP	2.0	0.8	-0.5	0.3	0.0	1.0	2.5	2.4	1.1	2.7	1.2
Asia	US$ Billions	7.6	12.9	27.5	32.2	20.9	54.3	64.3	91.2	98.3	28.8	52.2
	% Exports	9.8	10.7	13.5	14.0	7.9	18.0	17.5	20.1	19.4	5.2	14.5
	% GNP	1.2	1.5	2.6	2.9	1.7	3.7	4.1	4.9	4.6	1.3	3.2
Middle East and Europe	US$ Billions	-24.8	3.3	9.2	65.9	31.3	30.3	13.4	7.7	4.2	8.7	21.3
	% Exports	-12.2	2.3	4.9	38.0	16.4	16.4	7.0	3.6	1.7	3.4	11.4
	% GNP	-5.3	0.7	1.5	11.7	5.0	4.9	2.3	1.2	0.6	1.1	3.5
Western Hemisphere	US$ Billions	29.1	-1.5	14.1	25.5	55.9	63.1	46.5	38.2	81.8	87.5	51.6
	% Exports	28.9	-1.3	8.5	15.4	32.1	34.4	22.2	15.5	29.9	29.2	23.4
	% GNP	3.9	-0.2	1.3	2.2	4.5	4.6	3.0	2.3	4.5	4.4	3.4

Source: IMF, *World Economic Outlook* data base.

The timing, duration, and magnitude of the recent surge of capital inflows has not been uniform across regions. Figure 2 shows that private capital flows were heavily concentrated in the period 1990–97. The five largest recipients accounted for more than 50 percent of total inflows and a dozen countries accounted for 75 percent of that total (Figure 2). The surge phenomenon was particularly pronounced in Asia and Latin America, regions that experienced the earliest and larger inflows of capital (Tables 1 and 2). In particular, Chile, Malaysia, Thailand, and until 1994, Mexico, not only experienced the first capital surges but they were also among the largest recipients during the first half of the decade. After 1992, capital also started to flow to countries in Eastern Europe and the magnitude of this flow has been very large by any standards (Tables 1 and 2). Nevertheless, most developing countries are just beginning to be integrated into global financial markets, with 140 of the 166 developing nations accounting for less than 5 percent of total inflows (World Bank, 1997).

Figure 2. Concentration of Net Private Capital Flows, Selected Developing Countries, 1990–97



Source: IMF, *World Economic Outlook* data base.

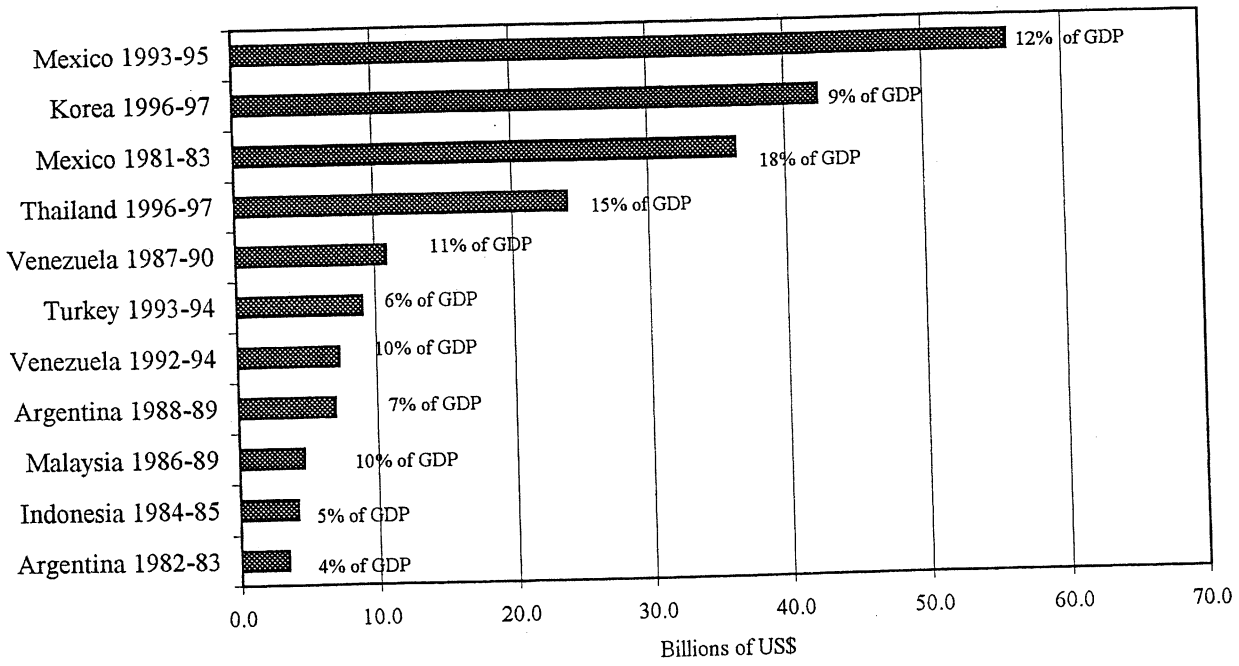
Table 2. Net Private Capital Inflows to 20 Developing Countries, 1989-95
(Net long-term international private capital as a percentage of GDP)

Country	Inflow episode [1]	Cumulative inflows/GDP at end of episode	Maximum annual inflow
Argentina	1991-94	9.7	3.8
Brazil	1992-95	9.4	4.8
Chile	1989-95	25.8	8.6
Colombia	1992-95	16.2	6.2
Hungary	1993-95	41.5	18.4
India	1992-95	6.4	2.7
Indonesia	1990-95	8.3	3.6
Korea	1991-95	9.3	3.5
Malaysia	1989-95	45.8	23.2
Mexico	1989-94	27.1	8.5
Morocco	1990-95	18.3	5.0
Pakistan	1992-95	13.0	4.9
Peru	1990-95	30.4	10.8
Philippines	1989-95	23.1	7.9
Poland	1992-95	22.3	12.0
Sri Lanka	1991-95	22.6	8.2
Thailand	1988-95	51.5	12.3
Tunisia	1992-95	17.6	7.1
Turkey	1992-93	5.7	4.1
Venezuela	1992-93	5.4	3.3

Source: World Bank (1997).
[1] The period during which the country experienced a significant surge in net private capital inflows.

The reversibility of capital flows has been a similarity between the 1990s and the late 1970s. Indeed, the crises experienced by many heavily indebted emerging markets in the early 1980s, and by Mexico in 1994-95, Asian countries in 1997, and Russia in 1998, were preceded by a surge of capital inflows. And when the crises broke there was an abrupt loss of market access and spillover effects to other similarly placed economies. Figure 3 shows the magnitude of the reversal (i.e., the sum of inflows and outflows) for a selected number of episodes.

Figure 3. Large Reversals in Net Private Capital Flows
(In billions of US dollars and as percentage of GDP)



Source: IMF, *World Economic Outlook* data base.

B. Asset Composition and Sectoral Destination

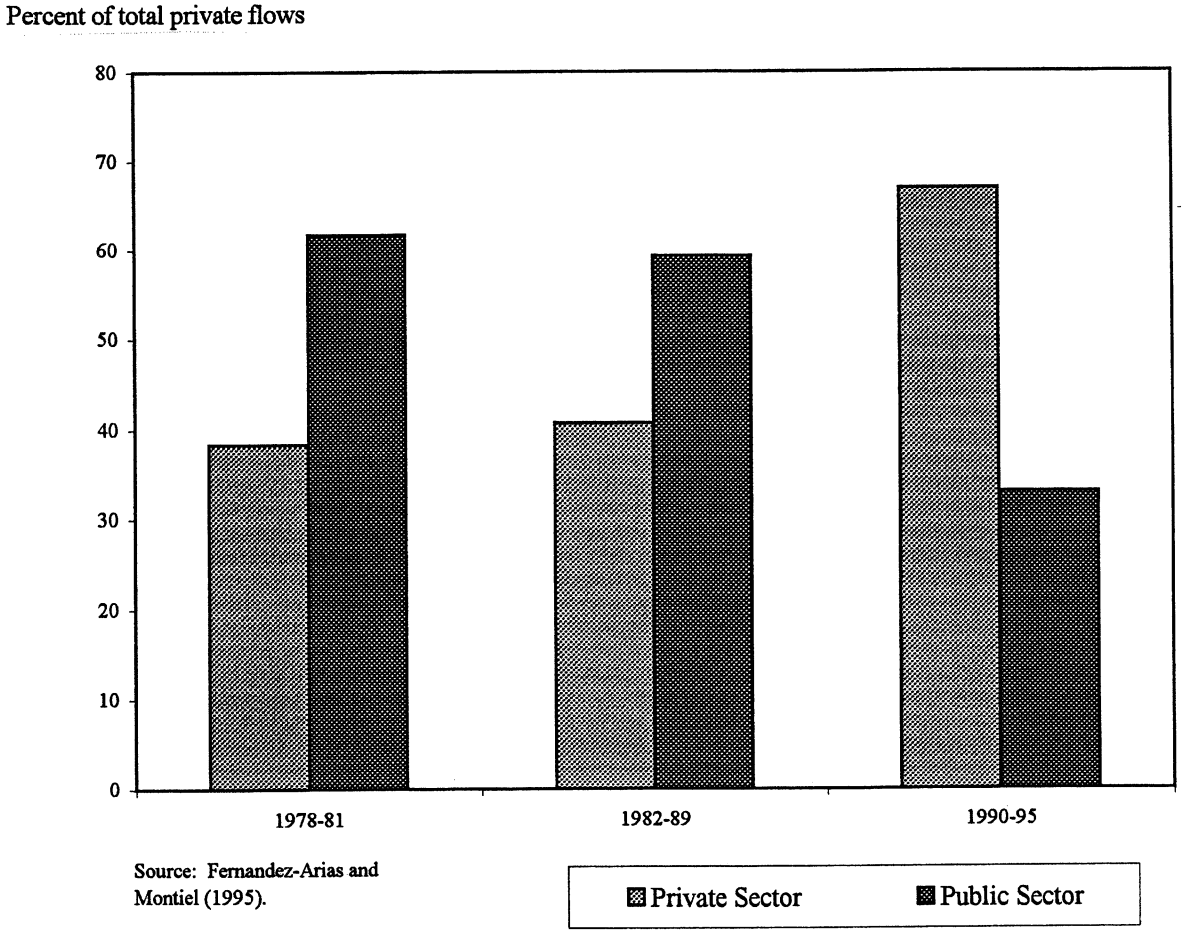
The composition of recent flows has changed substantially from that of the debt and predebt crisis periods (Table 3). In the late 1970s and 1980s, "other investment," which largely reflects debt flows, in particular bank lending, was the most important component of private net capital flows. In contrast, in the 1990s the surge has been dominated by bonds and nondebt-creating flows, namely foreign direct investment (FDI) and portfolio investment. Moreover, as Figure 4 suggests, whereas in the previous periods the public sector was the most important recipient of the flows, in the 1990s private agents have undertaken most of the external borrowing.

Table 3. Annual Capital Net Flows (All Developing Countries)

		1978-82	1983-89	1990	1991	1992	1993	1994	1995	1996	1997	1990-97
Net Capital Flows	US$ billions	40.5	45.8	61.8	149.1	125.0	169.9	144.0	180.3	193.6	135.7	144.9
	% Exports	8.6	9.8	9.3	22.2	17.0	22.1	16.6	17.5	16.8	10.8	16.5
	% GNP	2.3	1.9	2.4	5.4	4.0	5.3	4.1	4.7	4.7	2.9	4.2
Net Direct Investment	US$ billions	8.3	11.5	19.7	27.1	34.7	52.6	76.5	86.5	108.5	126.5	66.5
	% Exports	1.8	2.4	3.0	4.0	4.7	6.9	8.8	8.4	9.4	10.1	6.9
	% GNP	0.5	0.5	0.7	1.0	1.1	1.7	2.2	2.2	2.7	2.7	1.8
Net Portfolio Investment	US$ billions	1.7	5.1	20.0	36.0	44.2	97.1	85.7	22.2	52.7	55.5	51.7
	% Exports	0.4	1.0	3.0	5.4	6.0	12.7	9.8	2.1	4.6	4.4	6.0
	% GNP	0.1	0.2	0.8	1.3	1.4	3.0	2.5	0.6	1.3	1.2	1.5
Net Other Investment	US$ billions	30.5	29.2	22.1	85.9	46.1	20.2	-18.2	71.6	32.4	-46.3	26.7
	% Exports	6.4	6.4	3.3	12.8	6.3	2.6	-2.1	6.9	2.8	-3.7	3.6
	% GNP	1.7	1.2	0.8	3.1	1.5	0.6	-0.5	1.9	0.8	-1.0	0.9

Source: IMF, *World Economic Outlook* data base.

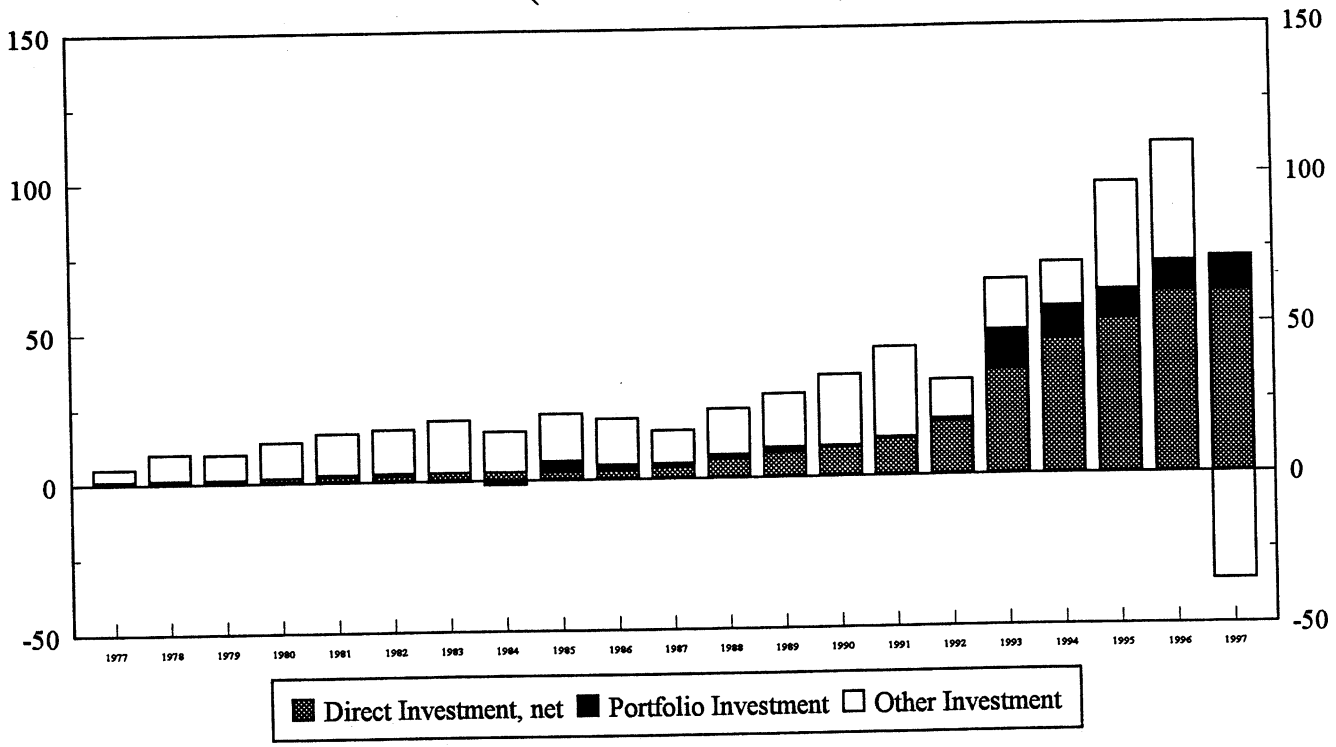
Figure 4. Sectoral Destination of Private Capital Net Flows



Source: Fernandez-Arias and Montiel (1995).

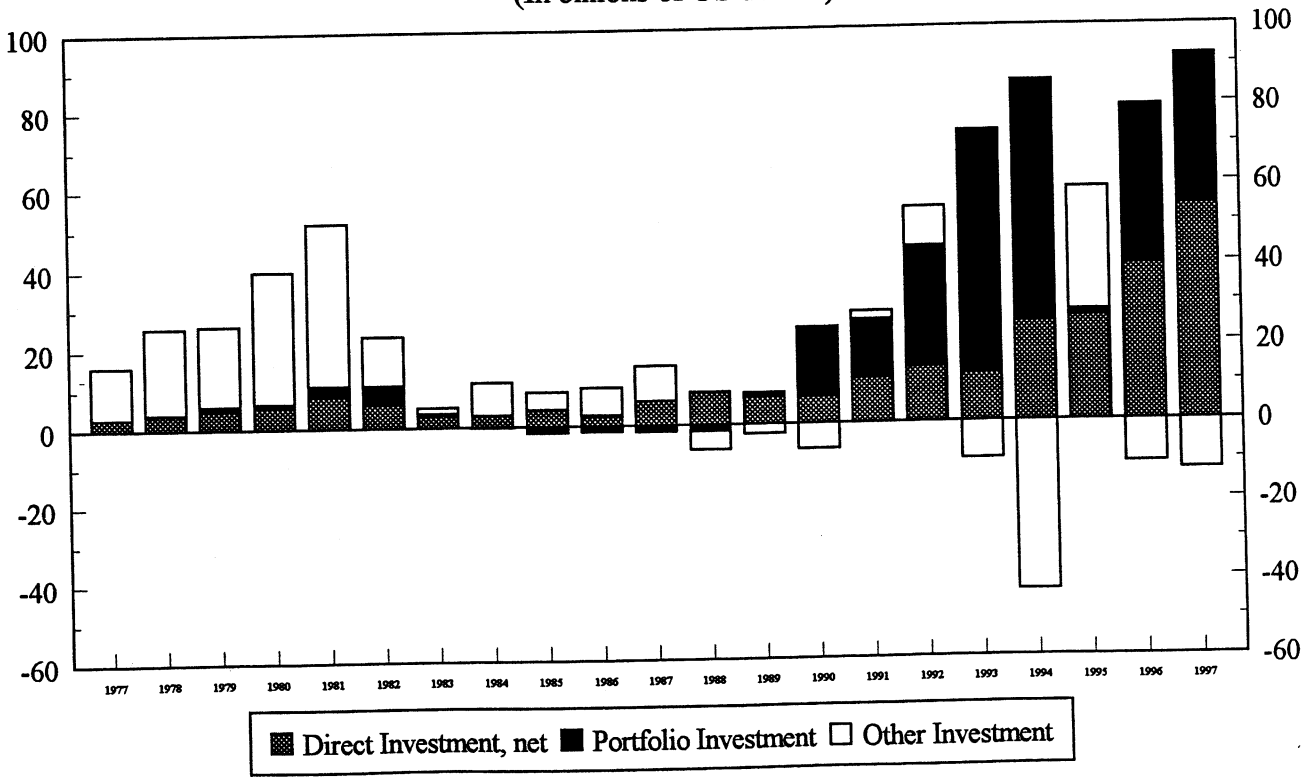
The reduced role of commercial banks and the importance of FDI during the current episode of capital inflows is widespread among regions. However, FDI has been more important in Asian countries than in the Western Hemisphere region, Africa, and the Middle Eastern and European developing countries, where portfolio investment and other investment accounted for most of the flows (Figures 5–8). Most studies have examined the composition of capital inflows from the stand point of desirability. Usually they highlight FDI as the most desirable form of capital flow because FDI brings along positive externalities, such as technology and management expertise. In addition, there is the popular perception that

Figure 5. Composition of Net Flows to Asian Developing Countries, 1977-97
(In billions of US dollars)



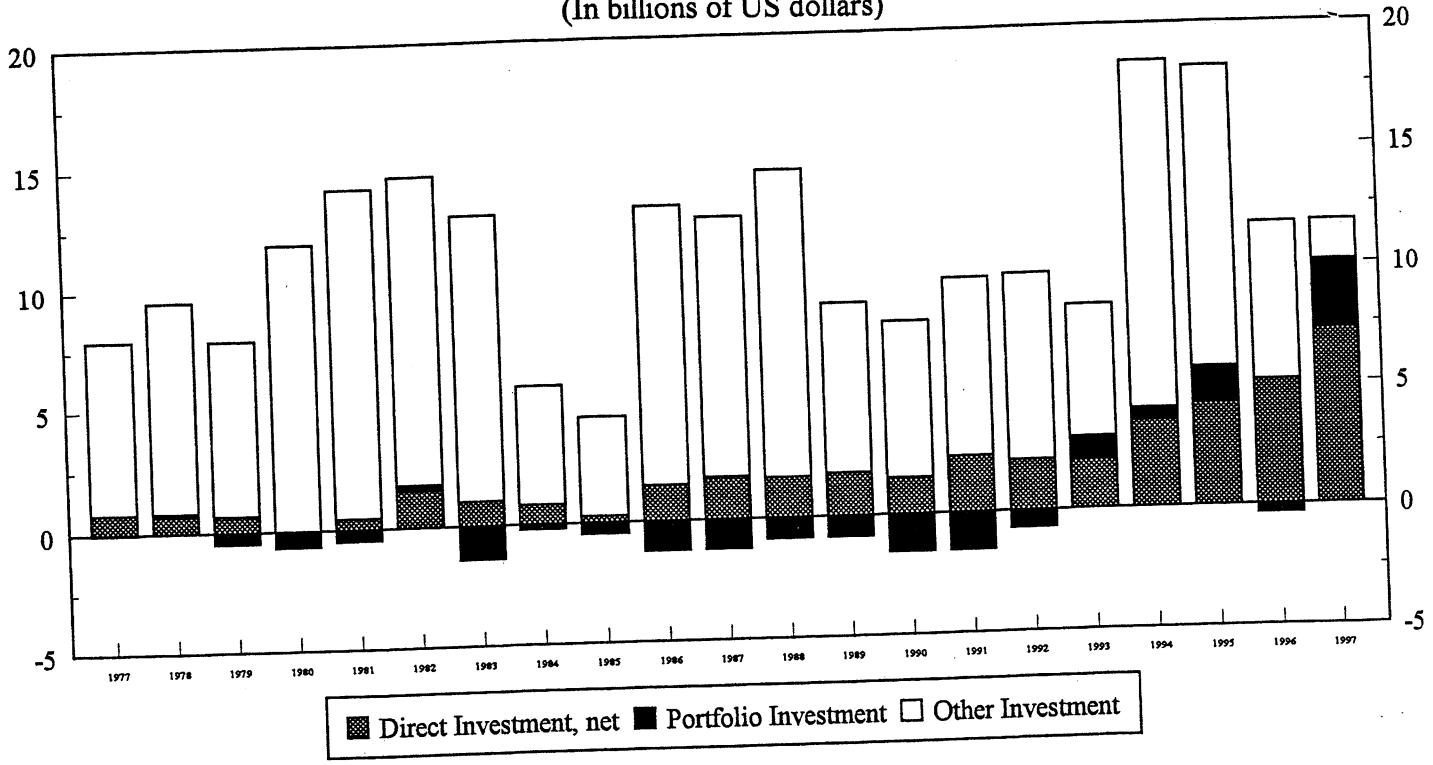
Source: IMF,, *World Economic Outlook* data base.

Figure 6.Composition of Net Capital Flows to Western Hemisphere Developing Countries, 1977-97
(In billions of US dollars)



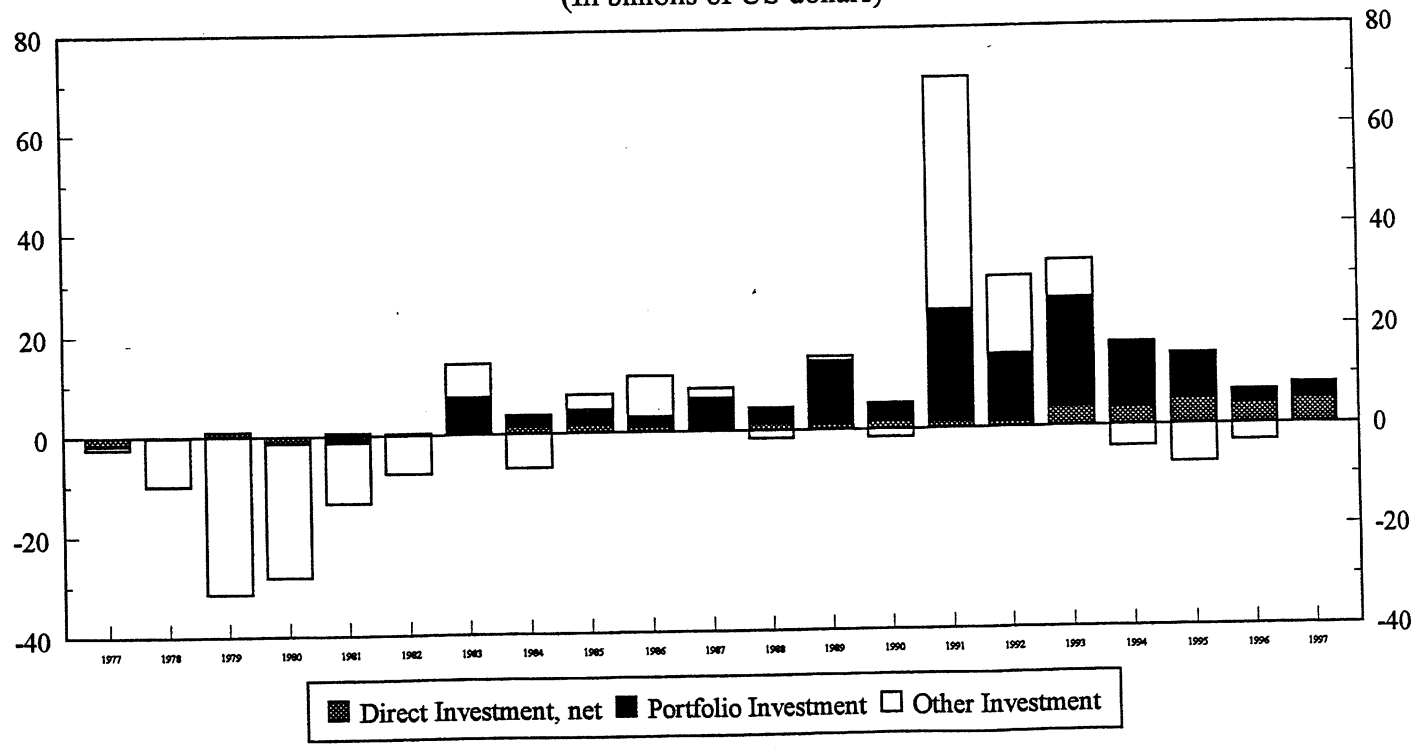
Source: IMF, *World Economic Outlook* data base.

Figure 7. Composition of Net Capital Flows to African Countries, 1977-97
(In billions of US dollars)



Source: IMF, *World Economic Outlook* data base

Figure 8. Composition of Net Capital Flows to Middle Eastern and European Developing Countries, 1977-97
(In billions of US dollars)



Source: IMF, *World Economic Outlook* data base.

portfolio flows have greater volatility because they are less costly to reverse than FDI. It is also argued that FDI has low sensitivity to international interest rates and is driven by firms' considerations of long-term profitability.

Before the Asian crisis, the empirical evidence suggested that in the 1990s capital inflows showed greater volatility in Latin America than in Asia and that in both regions short-term capital had been more volatile than other types of capital flows (Kaminsky and Reinhart, 1995). This result gave support to the popular perception regarding the relative volatility of different types of capital, but the issue is far from settled. In fact, Claessens, Dooley and Warner (1995) found no statistical support for the argument that long-term flows are less volatile and easier to predict than short-term flows. Moreover, if portfolio investment is classified separately from short-term flows, the magnitude of the latter and its share in total capital inflows is larger in Asia than in Latin America. It appeared then that the volatility of capital flows in Latin America could not be attributed to significantly larger inflows of short-term capital in comparison with Asian countries, but rather to the more skittish behavior of the flows in Latin America, stemming from the region's poorer macro policy track record and shakier credibility (Montiel and Reinhart, 1997).

However, the experience of the Asian crisis of 1997 has revealed the short maturity of debt to be a main determinant of the volatility of capital flows (Adams, et al., 1998). Indeed, despite the development of global derivative products in the 1990s, unhedged currency and interest rate exposures were key determinants of the crises in Mexico and Asia. In 1994, to facilitate the refinancing of their domestic debt and to gain credibility in their exchange rate arrangement, the Mexican government shifted from issuing peso-denominated debt to short-term debt securities with debt-service payments indexed to the US dollar. In 1997, the foreign exchange exposure of nonfinancial corporations played an important role in the Asian crisis. In countries with a fixed or pegged exchange rate, interest rates were higher than foreign exchange rates. Consequently, many firms financed their operations through security issues and loans in foreign currency, but those firms left foreign debt exposures unhedged. They neglected to hedge because domestic products were underdeveloped and purchasing offshore hedging products would have increased the cost of borrowing abroad. Moreover, this behavior was reinforced because the authorities had established a credible commitment to their exchange rate arrangement.

Despite the extensive literature developed after the inflow of capital in the 1990s, few studies have focused on understanding why the composition of capital flows has varied across regions. An exception is Chen and Khan (1997). The search for higher returns is one of the primary forces driving investors' decisions. Consequently, Chen and Khan focused on how the cost of financing to the recipient country could lead to different patterns of capital inflows. Although the absolute levels of growth potential and financial market development are relevant to capital flows, they showed that the relative magnitude of the two is also important

since it affects both the amount and the composition of capital inflows, generating a large variety of patterns.

Among the consequences of this finding, two have important policy implications. First, it implies that better financial market infrastructure by itself is not always sufficient to attract portfolio flows. Second, it indicates that "good quality" capital flow is not necessarily characterized by a high level of FDI and a low level of portfolio flows. Indeed, this composition could be a sign of an underdeveloped financial market in the recipient country that hampers the possibilities arising from its high growth potential.

These two implications could help policymakers in developing countries in understanding how they can affect the size and kind of capital flows from abroad. In addition, to design proper policies, they need to assess (i) whether the causes of the capital flows are permanent or temporary and (ii) the relative importance of internal and external factors. This is the purpose of the next section.

III. Causes of Capital Flows

What were the reasons behind the capital inflow episodes in various countries in the 1990s and the causes of major reversals? And what can explain the volatility recently observed in capital flows? This section examines these questions.

A. Causes of Capital Inflows

The primary forces driving investor interest in emerging markets, which have also led to their increased integration in world financial markets, are the search for higher returns and risk diversification. Although these forces have always driven investors' decisions, the responsiveness of private capital to opportunities in emerging markets started to increase in the 1990s because of both internal and external factors.

1. Internal Factors

The capital-inflow literature suggests that developments in capital-importing countries have improved private risk-return characteristics for foreign investors through two main channels. First, creditworthiness improved as a result of external debt restructuring in a wide range of countries. For example, Romania in the mid-1980s and Bulgaria and Poland by 1990 rescheduled their external debt. Moreover, heavily indebted Latin American countries such as

Argentina, Costa Rica, Mexico, Uruguay and Venezuela, and nations like Nigeria and the Philippines, benefited from the officially supported "Brady-type" initiatives.[2]

The second channel pulling investors to emerging markets were the productivity gains arising from structural reform and the confidence in macroeconomic management after successful stabilization programs in Eastern Europe, the Association of Southeast Asian Nations (ASEAN), and Latin American countries. The European countries carried out stabilization programs and structural reforms during 1990-91, and their capital account improved dramatically in 1992 and 1993 (Calvo, Sahay and Végh, 1995). In the mid-1980s, Indonesia, Malaysia, and Thailand introduced adjustment programs that reduced their large fiscal deficits, depreciated the currency, and decreased the overall rate of credit expansion. In the early 1990s the Phillippines followed this example. Moreover, in these four countries the stabilization policies were accompanied by measures that opened the economy to foreign trade and reformed the financial system (Koenig, 1996). In Latin America, Bolivia, Chile and Mexico adopted disinflation programs in the late 1980s, while Argentina, Brazil, Ecuador, and Peru did so in the early 1990s. As in the ASEAN countries, these policies were complemented by market-oriented reforms such as trade and capital market liberalization (see, among others, the series of papers by Calvo, Leiderman and Reinhart, (1993, 1994, 1996).

Schadler et al. (1993) argued that domestic influences were the dominant cause of capital inflows to emerging markets. They noticed that changes in external factors did not coincide and even postdated the surges in some of the countries reviewed. Moreover, the variation in timing, persistence, and intensity of the inflows among the different countries suggests that investors might have reacted to country-specific factors such as those highlighted by Chen and Khan (1997). The World Bank (1997) has provided the most systematic evidence regarding the importance of domestic factors but, contrary to Schadler et al.'s assessment, their role has been particularly relevant in recent years.

The Bank noticed several trends suggesting that flows have been driven by more than external factors. Among them, the following should be mentioned: (i) fundamentals affect the long-term rates of return to investors. Countries with the strongest fundamentals (i.e., high investment-to-GDP ratio, low inflation, and low real exchange rate variability) have received the largest flows as percentage of GDP whereas countries with very poor fundamentals have not attracted private flows; (ii) FDI is the largest component of private flows to emerging markets, but, although sensitive to macroeconomic fundamentals, it is not explained by global interest rates; (iii) portfolio flows are more sensitive to interest rates. Still, they have shown an upward trend since 1992–93 despite the increase in global interest rates. Nevertheless, the role of foreign factors cannot be ignored. As a matter of fact, many have assigned to them the

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[2]However, according to Dooley, Fernández-Arias and Kletzer (1996), the net debt reduction under the Brady plan represented only 15 percent of total debt.

predominant role in the current episode of capital flows (see, among others, Calvo, Leiderman and Reinhart, 1993, 1994, 1996).

2. External Factors

Calvo, Leiderman and Reinhart questioned the predominant role played by domestic policies in attracting private capital flows. They suggested that cyclical conditions in industrial countries have been the main factor driving these flows to developing countries [3] In particular, the decline in world real interest rates observed in the early 1990s attracted or "pushed" investors to emerging markets in two ways. First, and together with recessions in the United States, Japan, and many European countries, the decline in world interest rates made profit opportunities in emerging economies relatively more attractive. Second, it improved the creditworthiness and reduced default risk of debtor countries. The consequences of this explanation of capital surges are important. In fact, as pointed out by Calvo and his colleagues as early as in 1993, the explanation limits policy options to indirect and compensatory measures and suggests that a reversal of the push factors can lead to capital outflows, increasing macroeconomic vulnerability in emerging markets.

In the early 1990s , the cyclical argument on the importance of external factors was the prevailing view. However, the persistence of private capital flows after the increase in world interest rates in 1994 and the Mexican crisis suggested that structural external forces were also at work.[4] Two developments in the financial structure of capital-exporting countries have increased the responsiveness of private capital to cross-border investment opportunities. First, falling communication costs, strong competition, and rising costs in domestic markets, led firms in industrial countries to produce abroad to increase their efficiency and profits. This not only triggered FDI but also changed its nature in comparison to the 1970s and early 1980s. In those years, FDI was mainly driven by resource extraction and import substitution, whereas the progressive globalization of production has led to a high proportion of current FDI being characterized as efficiency-seeking investments.

The second development in the financial structure of industrial countries that increased capital flows to emerging markets was the growing importance of institutional investors. These investors found themselves more willing and able to invest abroad because of higher long-term expected rates of return in developing countries and to wider opportunities of risk

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[3] They recognized the important role played by domestic factors. Still, they stressed that this explanation failed to explain why inflows occurred in countries that had not undertaken reforms and why inflows only occurred in 1990 in countries where the reforms had started earlier.

[4]The remaining part of this subsection is largely based on The World Bank (1997).

diversification. The increase in long-term expected rates of return was the consequence of improvements in country creditworthiness after the adoption of structural reforms and macroeconomic stabilization programs in the late 1980s and early 1990s. Wider opportunities for risk diversification arose because of broader and deeper securities markets in emerging markets that expanded the range of instruments offered to investors and increased liquidity. In addition, these opportunities increased when markets in creditor countries became more globalized. This was the consequence of a process of competition, financial innovation, deregulation, and technological change, which, in turn, increased the growing importance of institutional investors.

Mutual and pension funds have been the most successful institutional investors. Driven by profit and subject to less regulations than pension funds, mutual funds started to grow and have international exposure in the 1970s. Consequently, the share of international assets in their portfolio did not vary much in this decade, except in the United States where that proportion increased from 3.8 percent in 1990 to 8.9 percent in 1994. This trend implied that emerging markets incremented their participation in international investment of these funds — a mutual fund investing in a wide range of emerging markets, or one that invests in a particular region, or a fund specialized in a single country. Still, emerging markets only account for about 2 percent of total mutual funds assets in the United States; about 3 to 4 percent in UK mutual funds; and almost none in Japan and the rest of Europe. On the other hand, pension funds began to have international exposure more recently given that they have always been heavily regulated and more cautious in nature. Nonetheless, investment in emerging markets as a percentage of total assets by pension funds is as important as in mutual funds, although only a fraction of the pension funds have a policy of allocating resources to developing countries.

These figures suggest that considerable room remains for expanding mutual and pension funds' investments in emerging markets. Even though the rate of growth and the level of capital flows were to eventually decline, several forces might help maintain and strengthen institutional investors' interests in these markets. First, policy reforms will likely increase the productivity of investment in developing countries. Second, the pyramidal structure of population in industrial countries should put pressure for pension reform, probably increasing the responsiveness of pension funds to investment opportunities in emerging markets.[5] Finally, during the next 10 to 15 years the aging of population in industrial countries may lead to

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[5] In contrast to industrial countries, the developing world shows a pyramidal structure which is much younger. This difference could also operate in maintaining capital flows to emerging markets. In fact, a slower growth in the labor force of industrial countries implies fewer workers per unit of capital, leading, other things being equal, to lower returns to capital relative to labor. Given that the reverse is expected in developing countries, the dissimilar demographic patterns between these regions should widen their differences on the expected rates of return, stimulating the flow of capital to emerging markets.

increased savings: public savings may increase as a result of ongoing efforts to strengthen public finances in the face of sizable future liabilities of social security schemes. In addition, private savings could increase in the short- to medium-term as people become increasingly aware that existing social security schemes are unlikely to carry out transfers to households at the expected levels.[6]

In summary, because of both cyclical and structural factors forces, external factors have had a significant role in the capital surge of the 1990s. The importance of structural forces gives rise to optimism on the volume of capital flows to developing countries in the medium term. However, with the growing importance of private capital flows has come the threat of major reversals. The factors that have contributed to the reversal are analyzed next.

B. Understanding Reversals of Capital Flows

In addition to the recent experiences in Mexico, Asia, and Russia, major reversals of capital flows have occurred in a number of other developing countries (Figure 3). Turkey and Venezuela, for example, were the first to experience large reversals in the 1990s. A common reason for most of the reversals has been lack of confidence in domestic macroeconomic policies. Consequently, the traditional theoretical literature on speculative attacks and balance of payments crises has played a predominant role in explaining recent foreign exchange market crises.

Under a fixed exchange rate, only a small fraction of domestic money supply should be backed by foreign exchange reserves. If the rate of growth of domestic credit permanently exceeds that of the nominal demand for money, the minimum level of reserves will eventually be reached creating a balance of payments crisis, forcing authorities to float or change the exchange rate. The gradual and persistent process of reserve loss during the fixed-rates period will be dramatically accelerated at the end. A speculative attack will take place because economic agents will try to avoid the capital loss on their domestic money holdings once the fixed exchange rate collapses (Krugman, 1979).

Although a continuous fall in international reserves is rare, and the assumption of perfect foresight prevents the existence of risk premia on domestic interest rates, similar results to the Krugman model can be obtained if these assumptions are modified. For example, it is possible to assume that reserve losses are sterilized so that the decline in reserves is offset by an increase in the central bank's net domestic assets. Moreover, domestic interest rates might not rise before the crisis if there is a reporting lag on aggregates such as reserves that

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[6]This effect could be somewhat offset if older generations prolong their participation in the labor force in reaction to the uncertainty of their pensions.

prevent investors from observing the problems faced by the exchange rate regime.[7] The Krugman model can also be extended to show that speculative attacks are usually preceded by real exchange rate appreciation, a deterioration of the current account of the balance of payments, higher real wages and lower competitiveness.[8]

Based on this literature, several symptoms of currency crises have been suggested and, eventually, may provide an early warning system to help governments adopt pre-emptive measures. Among the leading indicators of crises mentioned in the literature, the most common are persistent decline in international reserves, rapid growth of domestic credit relative to demand for money, fiscal imbalances, credit to the public sector, and the evolution of the real exchange rate, current account balance, real wages, and domestic interest rates.[9] Kaminsky, Lizondo and Reinhart (1997) examined the different approaches used in the empirical literature to assess potential indicators of currency crises and proposed a methodology for designing a warning system. The methodology follows the evolution of several indicators exhibiting unusual behavior before the crisis. If the behavior exceeds a certain threshold value it is interpreted as a signal that a currency crisis will take place in the following 24 months. According to this approach, the variables that best anticipate a crisis are exports, deviations of the real exchange rate from a trend, the relation between broad money and international reserves, output, and equity prices.

Recent models have suggested other variables as key determinants of currency crises. Calvo (1996) pointed out that the 1994 experience in Mexico showed that balance of payments crises can result not only from flow type disequilibria, like current account and fiscal deficits, but also from financial vulnerabilities. In particular, the decision of authorities to avoid an increase in domestic interest rates needed to maintain a fixed exchange rate might be signaling the presence of other factors affecting the authorities' objective function. If the banking sector is weak, they might prefer to devalue rather than to increase the interest rates to avoid a financial crisis and the cost of a bailout.[10] In addition, the decision to abandon the

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[7]Folkerts-Landau and Ito (1995) argued that with these two modifications to the Krugman model, the traditional approach could explain the main characteristics of the 1994 Mexican crisis.

[8]For detailed surveys of the literature see Agenor, Bhandari, and Flood (1992), Blackburn and Sola (1993), and Garber and Svensson (1994).

[9]Milesi-Ferretti and Razin (1996) argued that rather than current account deficits per-se, the issue was to evaluate the sustainability of large and/or persistent current account imbalances as an indicator of balance of payments crises.

[10]The weakness of the banking sector could be attributed to implicit guarantees extended to

(continued...)

parity might depend on the stock of public debt. Moreover, as shown by the Mexican experience, the maturity and currency composition of the public sector's liabilities relative to that of its assets is particularly relevant. In fact, even if the public sector is solvent (i.e., it is expected to honor its obligations over a long horizon), it might be vulnerable to short-run liquidity crises if creditors are reluctant to refinance government's short-term liabilities. Furthermore, where the government debt is held matters since holdings by domestic residents tend to be more stable than those by foreign residents.

These models, therefore would suggest the leading indicators of future balance of payments crises to be such factors as banking problems (see Kaminsky and Reinhart, 1995, for an empirical analysis) and measures of a country's international reserve position net of its short-term foreign currency debt. The new literature also implies that to take financial considerations into account, reserves adequacy needs to be measured not only by the equivalent number of months worth of imports but also by the ratio of monetary aggregates to reserves. Indeed, this ratio indicates the extent to which international reserves could be used to cushion the effects of fluctuations in monetary aggregates and debt-refinancing difficulties.

As noticed by Kaminsky, Lizondo, and Reinhart (1997) some of the new literature also suggests that crises might develop without significant changes in economic fundamentals, implying that the probability of predicting a crisis is low. These models are characterized by the presence of multiple equilibria and self-fulfilling crises. These characteristics are generated by the assumption that the expectations and actions of economic agents affect some of the variables to which economic policies react; and because, at the same time, economic policies respond to changes in the economy, while rational economic agents form their expectations accordingly.

Finally, based on the models that focus on contagion as the cause of balance of payments crises, a leading indicator could be a crisis in a neighboring country. The role of contagion effects and herding behavior is particularly important for understanding the recent volatility of the international capital markets. As will be argued in the next section, this volatility is associated mainly with portfolio flows and is driven largely by the growing process of financial integration.

C. Causes of Volatility and Contagion

At the individual country level, policymakers are not only concerned about the appropriate policy response to capital inflows and the possibility of large reversals. In fact, as

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[10](...continued)
banks and investors by the government (Dooley, 1996).

countries become more integrated, the volatility and contagion associated with private capital are likely to increase.

The main sources of volatility are interest rates, stock market returns, and contagion effects. Changes in interest rates can have large impacts on the macroeconomic performance and creditworthiness of developing countries. Moreover, if investments in emerging markets are used only to increase portfolio returns when investments in industrial countries are underperforming then the investments will be very sensitive to changes in industrial countries' interest rates. Still, the evidence suggests that this sensitivity is only true for portfolio flows and not for FDI (World Bank, 1997).

The contagion effects associated with private capital are likely to occur through five channels. First, trade arrangements and exchange rate pressures contribute to volatility and contagion effects. In particular, when a depreciation occurs in one country, countries that trade with that country or are direct competitors in third markets will suffer in terms of competitiveness and output, which in turn make their currencies more susceptible to speculative attacks. However, the empirical evidence is not conclusive regarding the importance of trade arrangements as determinants of contagion. Eichengreen, Rose, and Wyplosz (1996) found that the effect of contagion through trade is stronger than that of contagion through macroeconomic similarities, and Goldstein (1998) argued that Asian trade partners show sufficiently large direct and third-country effects to justify sequential devaluations. But Bhattacharya and others (1998) argued that the Asian trade patterns cannot fully explain the pattern and size of depreciations.

A second channel of contagion is known as the "wake-up call" phenomenon, whereby the collapse of one currency alters the perception of investors about other countries' fundamentals (Goldstein, 1998). If investors find the same weaknesses in the other countries their ratings are reduced and the crisis spreads. Goldfajn and Baig (1998) confirm the importance of investor psychology in the Asian crisis. They find evidence that news elsewhere affects the currency and equity markets, even after controlling for own-country news and other fundamentals. Still, the paper cannot distinguish between the wake-up call phenomenon and herding behavior.

The herding behavior of institutional investors is a third channel of contagion, inducing common outcomes in countries with very heterogeneous fundamentals. This behavior can be largely attributed to asymmetric information. Fund managers might follow the colleagues' decision to show clients they know their job. If the investment is unprofitable, this behavior will increase the probability that the fund managers will be thought of as unlucky rather than unskilled. In addition, if the mandate of the fund manager stipulates the fund has to perform at least as well as the median fund, the incentive to herd increases. Examining evidence on this source of contagion in Asia and Latin America before and after the 1994 Mexican crisis, Calvo and Reinhart (1996) argued that this phenomenon is more regional than global.

Moreover, they presented evidence of "large neighbor" effects in Latin America, where smaller countries were systematically influenced by the capital account developments in their large neighbors.

A fourth channel of contagion are the financial links between countries. For example, as shown recently in Korea, the pattern of financial holdings can lead to shocks being propagated into other countries, regardless of the country's fundamentals. Korean banks accumulated significant amounts of high-yielding Brazilian and Russian government debt. At the same time there was substantial Brazilian investment in Russian debt. Consequently, when Korean banks had liquidity problems they began to sell their Brazilian and Russian assets, leading to falls in asset prices in those countries and substantial sales of Russian debt by Brazilian investors (Adams, et al., 1998).

Finally, liquidity management practices of open-end mutual funds are a fifth channel of contagion. Leveraged investors facing margin calls need to sell their asset holdings, and because of information asymmetries, the assets might to be sold at low prices. A variant of this case is an open-end portfolio manager who needs to raise liquidity in anticipation of future redemptions. As in the previous case, the best strategy is to sell those assets in the portfolio that have not collapsed. However, because of this behavior, other asset prices fall and the original disturbance spreads across markets (Kaminsky and Reinhart, 1998).

IV. Consequences of Capital Inflows

Investors' interest in developing countries has led to increased financial integration with benefits for individual countries, and the global economy as a whole. Financial flows boost growth in developing countries by financing investment and consumption. They also reduce the volatility of consumption by augmenting the opportunities for risk diversification and by allowing international borrowing to offset temporary declines in income. However, large capital inflows might also imply an excessive expansion of aggregate demand and have negative effects on the financial sector. In addition, microeconomic distortions can amplify capital flows and their impact on the economy. This section examines the mechanisms that give rise to these consequences and studies whether the alleged effects of capital flows were present in the 1990s in a sample of countries.

A. Overheating

Standard open economy models predict that capital inflows lead to excessive expansion of aggregate demand—or macroeconomic overheating. This expansion is likely to be reflected in inflationary pressures, real exchange rate appreciation, and widening current account deficits. These models assume an economy with two goods—traded and nontraded—and a representative consumer with perfect foresight who maximizes utility by choosing

sequences of consumption of the two goods over time. Accordingly, in these models a decline in the world interest rate induces income and substitution effects in the capital importing country generating increases in consumption and investment, a decline in savings, and a deterioration of the current account. Ultimately, however, the effects on inflation and the real exchange rate will largely be determined by the exchange rate regime and the amount of international reserve accumulation.

As predicted by open economy models, with the exception of Chile, India, and Sri Lanka, the current account deteriorated in all countries during the inflow period. Venezuela and Hungary experienced the largest deficits in the current account followed by Mexico, Korea, and Colombia. However, new capital inflows were also used to accumulate international reserves. Indeed, in 9 of the 20 countries, international reserve accumulation absorbed more than 50 percent of the inflows. Chile, Colombia, Korea, Tunisia, and Venezuela were the only countries in which the accumulation of international reserves during the inflow period was lower than in the years before the surge. In contrast, foreign exchange intervention was strong in ASEAN countries and in Brazil, India, Morocco, and Pakistan (Table 4).

The generalized deterioration in the current account was the consequence of increases in investment and consumption ratios to GDP. The investment ratio rose in 15 of the 20 countries in the sample (Table 5). With the exception of the Phillippines, the increase was sharp in ASEAN countries—particularly Thailand (13.4 percent)—and Chile (10.2 percent), whereas Peru and Poland experienced a dramatic decline. The consumption ratio declined in 9 of the 20 countries in the sample but significant reductions were observed only in Chile, Thailand, and Indonesia. Still, overconsumption is as problematic as overinvestment. The 1997 Asian crisis has shown that low-quality investment causes severe vulnerabilities because it does not contribute to future productive capacity and repayments of the external debt. The low productivity of investment was the consequence of weakly supervised and regulated financial sectors with poor risk management and lending problems. In these circumstances—and because of weak corporate governance and moral hazard in the financial and corporate sectors—capital inflows and high domestic savings were not invested and managed efficiently (Adams, et al., 1998).

According to standard open economy models, increases in consumption and investment appreciate the real exchange rate. These increases put upward pressure on the relative price of the nontraded goods since they are in more limited supply than traded goods.[11] In addition, given that consumption tends to be less tilted toward traded goods than investment, real exchange rate appreciation is more likely when capital inflows finance

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[11] If an exchange rate-based inflation stabilization program lacks credibility, the current nominal interest rate will differ from its expected higher level in the future and the macroeconomic outcomes are similar to a temporary decline in international interest rates (Calvo and Végh, 1993).

consumption rather than investment. The composition of total consumption will also affect the real exchange rate if public consumption is more biased toward nontraded goods than private consumption. If the flows take the form of FDI, the pressure on the real exchange rate is likely to be ameliorated since these flows are usually not intermediated through the domestic banking system, which results in a comparatively smaller money and domestic credit expansion.

The real exchange rate appreciated in 12 of the 20 countries in the sample (Table 6). With the exception of Chile, a real appreciation occurred in all Latin American countries, whereas East Asian countries were among the few that had large real depreciations or kept the exchange rate nearly stable. As predicted by standard open economy models, the real appreciation of the exchange rate was linked to increases in the consumption ratio. Still, given that the appreciation of the exchange rate was not associated with an acceleration of inflation, the regional differences appear to be associated more with the use of the exchange rate as a nominal anchor than with overheating (World Bank, 1997).[12]

As argued before, the monetary consequences of capital inflows depend crucially on the exchange rate regime. Under a free float, a positive shock to the capital account generates no change in international reserves and monetary aggregates, but creates a nominal exchange-rate appreciation that induces a current account deficit. Under fixed exchange rates, the intervention of the monetary authorities required to defend the parity will lead to reserve accumulation and increases in the money supply, lower domestic interest rates, and higher domestic asset prices. The result is an expansion of aggregate demand with a rise in domestic inflation once excess capacity is absorbed. Under these circumstances, the real exchange rate appreciates because of higher internal prices, abetting the current account deficit. In intermediate and most frequently adopted regimes, and under imperfect capital mobility, the authorities defend a predetermined nominal exchange rate, while pursuing a target for monetary aggregates. In this context, the amount of reserve accumulation is a policy choice: the more aggressive the accumulation, the lower (higher) the pressures on the nominal exchange rate (inflation).

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[12]In general, the popular view according to which the appreciation of the real exchange rate is caused by capital inflows has to be taken with care (Agenor, McDermott, and Ucer, 1997). In fact, capital inflows are an endogenous response to perceived changes in relative rates of return between domestic and foreign assets, which, in turn, are affected by the overall policy stance. Thus, the pressure on the relative price of nontraded goods could be the result of combining expansionary fiscal policy with relatively tight monetary policy, since this combination tends to generate changes in interest rates differentials that encourage capital flows. Another aspect of the endogeneity is that the fiscal position itself might be affected by capital movements. This is particularly relevant if capital inflows (outflows) are associated with strong (weak) economic performance, booming (declining) imports, and high (low) customs duty receipts (Heller, 1997).

Table 4. Disposition of Private Capital Inflows in 20 Countries During Inflow Episodes (Change)

Country	As a percentage of GDP [1]				Change in current account (percent) [4]	Change in reserve accumulation (percent) [5]
	Net private inflows (1)	Net official inflows (2)	Current account deficit [2] (3)	Reserve accumulation [3] (4)		
Argentina	2.30	0.02	1.79	0.53	77	23
Brazil	2.75	-0.17	0.64	1.94	25	75
Chile	1.83	-2.06	-4.86	4.62	2,070	-1,970
Colombia	4.91	-0.90	4.90	-0.89	122	-22
Hungary	15.50	-1.75	9.78	3.97	71	29
India	0.63	-0.56	-1.21	1.28	-1,720	1,820
Indonesia	1.42	-0.65	0.15	0.61	20	80
Korea	4.20	0.26	4.97	-0.51	111	-11
Malaysia	5.95	-0.31	2.86	2.78	51	49
Mexico	7.17	-0.14	7.05	-0.02	100	0
Morocco	3.74	-2.25	0.11	1.39	7	93
Pakistan	2.51	-0.26	0.92	1.33	41	59
Peru	4.43	-0.27	1.38	2.79	33	67
Philippines	3.78	-0.65	0.66	2.47	21	79
Poland	5.93	0.41	3.89	2.44	61	39
Sri Lanka	4.81	-1.26	-0.19	3.74	-5	105
Thailand	6.83	-1.21	2.31	3.31	41	59
Tunisia	4.38	-1.47	3.73	-0.82	128	-28
Turkey	2.57	-0.58	1.38	0.61	69	31
Venezuela	9.03	-1.15	14.59	-6.71	185	-85

Source: World Bank (1997).

[1] Columns 1–4 show the change in the main components of the balance of payments during the respective inflow periods as compared with the immediately preceding period of equal length.

[2] A Minus sign means improvement in the current account balance.

[3] A Minus sign means a decline in reserve accumulation.

[4] Column 3/ (columns 1 + 2).

[5] Column 4/ (columns 1 + 2).

Table 5. Composition of Absorption in 20 Countries During Inflow Episodes
Change from immediately preceding period of equal length

		As a percentage of GDP		
Country	Inflow episode	Current account deficit [1]	Total investment	Total consumption
Argentina	1991–94	1.8	0.6	4.4
Brazil	1992–95	0.6	-2.0	3.6
Chile	1989–95	-4.9	10.2	-8.5
Colombia	1992–95	4.9	0.9	4.1
Hungary	1993–95	9.8	1.6	6.4
India	1992–95	-1.2	-1.3	-1.7
Indonesia	1990–95	0.2	5.7	-5.2
Korea	1991–95	5.0	4.7	1.1
Malaysia	1989–95	2.9	4.8	-1.8
Mexico	1989–94	7.1	2.4	6.7
Morocco	1990–95	0.1	-1.1	0.8
Pakistan	1992–95	0.9	1.0	-2.0
Peru	1990–95	1.4	-4.0	3.1
Philippines	1989–95	0.7	1.7	6.1
Poland	1992–95	3.9	-11.1	11.3
Sri Lanka	1991–95	-0.2	2.2	-1.9
Thailand	1988–95	2.3	13.4	-11.2
Tunisia	1992–95	3.7	2.6	-1.4
Turkey	1992–93	1.4	1.3	-0.5
Venezuela	1992–93	14.6	6.8	6.8

Source: World Bank, (1997).

[1] A minus sign indicates improvement in the current account balance.

Table 6. Macroeconomic Performance of 20 Countries During Inflow Episodes
Change from immediately preceding period of equal length

Country	Inflow episode	Average annual GDP growth (percent)	Average annual inflation (percent)	Average current account deficit [1]	Average REER [2]
Argentina	1991–94	9.1	-801.1	1.8	91.7
Brazil	1992–95	3.1	-93.5	0.6	7.4
Chile	1989–95	5.7	-4.1	-4.9	-25.5
Colombia	1992–95	1.6	-4.8	4.9	14.7
Hungary	1993–95	7.5	-5.5	9.8	18.9
India	1992–95	-0.7	0.1	-1.2	-30.8
Indonesia	1990–95	2.2	1.3	0.2	-29.4
Korea	1991–95	-2.5	0.8	5.0	4.4
Malaysia	1989–95	4.0	1.4	2.9	-24.5
Mexico	1989–94	2.9	-74.4	7.1	20.0
Morocco	1990–95	-3.3	0.1	0.1	-6.5
Pakistan	1992–95	-2.3	1.7	0.9	-9.0
Peru	1990–95	3.3	-79.1	1.4	120.9
Philippines	1989–95	2.2	-3.1	0.7	-10.7
Poland	1992–95	8.5	-146.7	3.9	37.9
Sri Lanka	1991–95	2.0	-2.2	-0.2	0.6
Thailand	1988–95	3.9	-1.1	2.3	-18.9
Tunisia	1992–95	0.5	-2.2	3.7	0.6
Turkey	1992–93	1.4	5.0	1.4	1.0
Venezuela	1992–93	-5.0	-2.7	14.6	9.8

Source: World Bank, (1997).

[1] As a percentage of GDP. A minus sign indicates an improvement in the current account balance.
[2] Percentage change in the real effective exchange rate (REER). A positive number indicates an appreciation.

Except for pressures in the current account, Table 6 shows that countries in the sample avoided most of the symptoms of macroeconomic overheating (i.e., acceleration of economic growth, inflation and appreciation of the real exchange rate). As mentioned above, the appreciation of the exchange rate in the sample of countries seems to be related to the use of the exchange rate as a nominal anchor. Moreover, even if a variable moved in a direction consistent with upward pressures on aggregate demand, the factors behind such behavior could not necessarily be attributed to capital inflows. For example, growth accelerated sharply in Argentina, Hungary, Peru, and Poland because of changes in the policy regime that also contributed to a dramatic decline in inflation. On the other hand, acceleration of inflation was almost absent in all countries during the surge period.

B. Effects of Capital Inflows on the Financial Sector

Capital inflows affect the financial system that intermediates them. In particular, they have two major effects on the domestic banking system. First, the quasi-fiscal deficit increases as a result of sterilization policy that sells high-yielding domestic bonds and buys foreign exchange earning lower interest rates. In Latin American countries, estimates of such costs range from 0.25 percent to 0.50 percent of GDP a year (Kiguel and Leiderman, 1993). Second, the financial system might become more vulnerable because of a rise in lending that may exacerbate the maturity mismatch between bank assets and liabilities and reduce loan quality. The increases in bank credit were a generalized outcome of capital inflows. With the exception of Argentina, Chile, and Venezuela in the 1990s, the ratio of bank lending to the private sector as a share of GDP was higher in the inflow periods than in the years prior to the inflow (Figure 9). The vulnerability of the financial sector as a result of lending booms was usually strengthened by a surge in asset prices that at the end proved unsustainable (Figure 10).

Indeed, if capital inflows are accompanied by an increase in asset prices, the financial sector will be more vulnerable because households' debts and consumption rise as appreciated assets are used as collaterals for new loans.[13] Poorly managed and supervised banks might finance consumption booms and speculative activities, such as a boom in construction and real estate. As a consequence, resources will be misallocated and financial distress will be a likely outcome once asset prices decline. This fall will be accompanied by higher interest rates causing overindebted agents to default on their debts, and the reduced value of the collateral will not be enough to cover the banks' losses.

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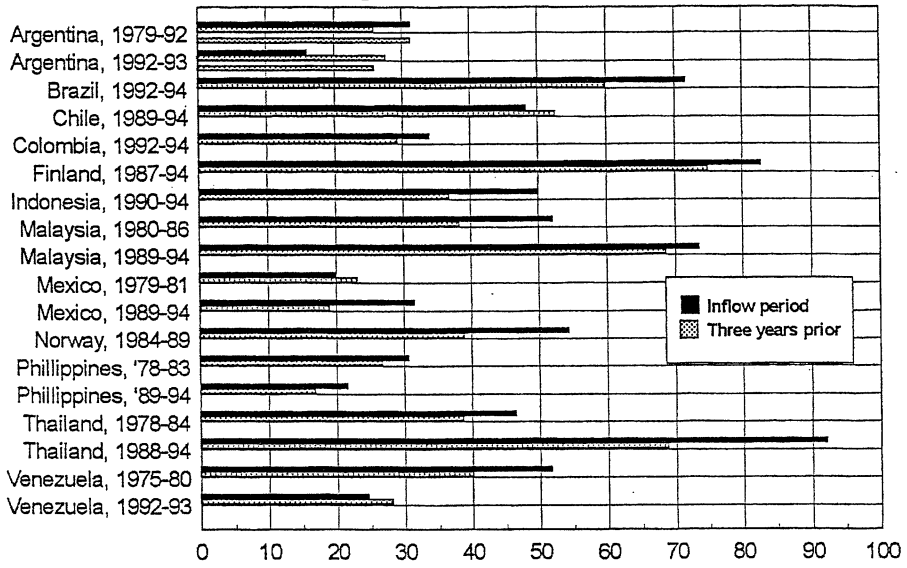
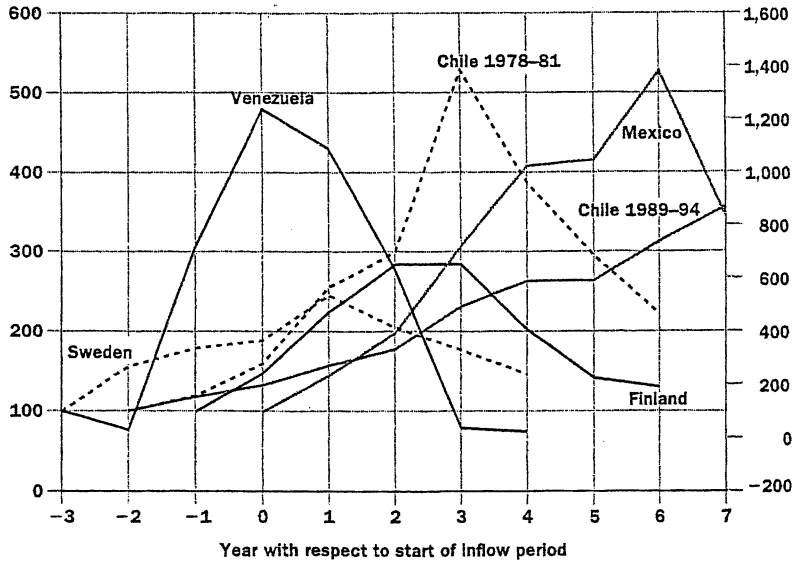
[13] Standard open economy models anticipate that equity and real estate prices are likely to increase following capital inflows, if other assets are included into the analysis (Calvo, Leiderman and Reinhart, 1996).

Figure 9. Bank Lending to the Private Sector During Inflow and Preinflow Periods, Selected Countries and Years1/
(As a percentage of GDP)



Source: IMF, *International Financial Statistic* Data Base.
1/ For Finland, Malaysia, Norway, and the Philippines, deposit money banks lending to the private sector was substituted for the Bank lending, as data were incomplete or unavailable.

Figure 10. Stock Prices During Inflow Periods, Selected Countries
(stocks' real price index)1/



Source: World Bank, (1997).
1/ The index for Finland, Mexico, and Sweden is shown on the left; the index for Chile during the 1980s and 1990s for Venezuela is shown at the right.

According to the World Bank (1997), countries with the highest increase in bank lending were not only the ones that later experienced a banking crisis but also were usually the ones in which macroeconomic vulnerability was higher—measured by increases in the current account deficit, real exchange rate appreciation, excess consumption, and underinvestment.[14] Nonetheless, the factors that give rise to the exaggerated cycles in capital flows are not only related to macroeconomic factors, but also to microeconomic factors. These factors are studied below.

C. Factors that Exacerbate the Boom-Bust Cycle

An important puzzle for the study of development economics is how a developing country can shift from a path of reasonable growth before a financial crisis to a sharp decline in activity after a crisis. At least six factors can explain why the boom-bust cycle is exacerbated during capital flows.

First: lack of credibility in a trade reform (Calvo, 1989). A trade reform that lacks credibility creates the expectation of a future tariff increase, making imported durable goods temporarily cheap; thus increasing expenditure on such items. An exchange rate-based inflation stabilization program that is temporarily effective but is not expected to last creates a discrepancy between the current nominal interest rate and its expected higher levels in the future. This type of shock leads to a rise in consumption, an increase in the current account deficit, and a real exchange rate appreciation. Likely examples of the mechanism are Argentina under the Austral plan and Brazil under the Cruzado plan (Reinhart and Végh, 1995).

Second: credible reforms. When reforms are credible, they generate optimistic expectations of future income, and at least some economic participants undertake discrete new investments that are large relative to their initial endowments. Initially, improved economic performance and large inflows of foreign capital justify such optimism. Moreover, the presence of deposit insurance may lead banks to overlend, sending a falsely optimistic signal to nonbank firms and households on the macroeconomic outcome of the reform process. But, later sustainability conditions bind, leading the economy into recession, financial crisis, and capital flight. Events in Mexico in 1994 and Chile in 1978–82 are good examples of the vulnerability to the overborrowing syndrome of economies undertaking liberalization programs (McKinnon and Pill, 1996).

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[14] For example, Argentina (1979–82), Brazil (1992–94), Chile (1978–81), Finland (1987–94) and Mexico (1989–94) had increases in investment smaller than predicted by the size of the inflows. In a number of countries the opposite was true on consumption: Argentina (1992–93), Brazil (1992–94), Finland (1987–94), Mexico (1989–94), Norway (1984–89), Sweden (1989–93) and Venezuela (1975–80).

Third: asymmetric information. The inefficiencies that arise because of asymmetric information are caused by herding behavior, adverse selection, and moral hazard. Calvo and Mendoza (1997) argue that globalization, by increasing the menu of assets available to investors, reduces the incentive to acquire information on individual assets, aggravating the problem of asymmetric information that encourages herding.

In the banking sector, adverse selection occurs when lenders have incomplete knowledge of borrower quality. Lenders are willing to lend at an interest rate that reflects the average quality of firms applying for loans. As a result, high-quality firms will not seek financing in the market, whereas low-quality firms will wish to overborrow, so that many projects whose net present value is lower than the opportunity cost of funds are financed. Moral hazard occurs when borrowers have incentives to engage in high risk activities. In particular, borrowers may wish to invest in projects in which they do well if the project succeeds but the lender bears most of the loss if the project fails. As a consequence, a conflict of interest arises between the borrower and lender: lenders will be reluctant to make loans, resulting in low levels of intermediation and investment (Mishkin, 1996).

Problems of adverse selection and moral hazard can be extended to the international level. Dooley (1997) develops a first generation model which, in contrast to other first-generation models, allows private capital inflows to precede the crisis. In this model, there is a policy conflict between the desire of a credit-constrained government to accumulate international reserves and the government's desire to insure financial liabilities of residents. The availability of free insurance raises the market yield on a set of liabilities issued by residents, creating an incentive for domestic residents and foreign investors to acquire financial instruments protected by government insurance. In this model, a speculative attack on the currency is generated when the government's reserves are exactly matched by its contingent insurance liabilities. At this point, the yield on domestic liabilities falls below market rates and investors sell the insured assets to the government, depleting its reserves.

Fourth: inadequate supervision and regulation of financial institutions. As mentioned in the previous section, poorly managed and supervised banks are likely to finance consumption booms and speculative activities, resulting in misallocated resources and financial distress once asset prices decline (Calvo, Leiderman, and Reinhart, 1994).

Fifth: shallow capital markets. As noted in section III.C, in the events leading to the crisis in Korea, the pattern of financial holdings led shocks in one country to be propagated into other countries because markets were insufficiently deep. As a consequence, sales by one group of investors led to substantial and general falls in asset prices in emerging markets (Adams, et al., 1998).

Sixth: price and wage rigidities. In particular, in the Dornbusch model (1976), national price levels are slowly adjusting variables, whereas the exchange rate jumps instantaneously in response to new economic or political information. Consequently, in the process of adjustment

to an unanticipated change in the money supply, the exchange rate will overshoot its equilibrium value in the short run. The jump depreciation of the domestic currency coincides with a decline in the domestic interest rate and stimulates domestic output, which sets in motion the price adjustment process. Alternatively, price and wage rigidities in the presence of an appreciation of the domestic currency can lead to the deterioration of the current account deficit, recession, and the eventual collapse of the exchange rate regime.

In summary, capital flows imply an excessive expansion of aggregate demand. They can have negative effects on the financial systems, and the effects on the economy can be amplified because of microeconomic distortions. Nonetheless, some countries have been able to avoid most of the symptoms of macroeconomic overheating, not all countries that experienced a credit boom ended up with weaker financial systems, and the magnitude of the boom-bust cycle has been different in each country. It is thus important to understand how these countries avoided the alleged consequences of inflows. The next section tackles these issues by studying the policy responses of several countries.

V. Policy Responses

Countries that have managed to overcome overheating and the adverse financial sector effects of capital inflows have relied on more than a single policy measure. After all, the appropriate combination of policy options depends on a variety of factors, such as the causes behind the inflows (i.e., whether they are temporary or permanent), the availability and flexibility of different instruments, the nature of domestic financial markets, and the macroeconomic and policy climate of the recipient country (Khan and Reinhart, 1995). The role and merits of the different measures are examined below, distinguishing among countercyclical measures, structural policies, and capital controls. In addition, given the interaction between individual policies, issues related to the policy mix and sequencing are also discussed.

A. Countercyclical Policies

1. Monetary Policy

In an exchange rate regime that is not completely flexible, monetary policy avoids aggregate demand pressures by sterilizing the monetary expansion caused by the accumulation of international reserves. The larger the accumulation of reserves, the more thoroughly the authorities will avoid nominal exchange rate appreciation. In turn, this will imply a stronger sterilization policy if the increase in monetary aggregates is to be limited. There are three types of sterilization policies: open market operations, increases in reserve requirements, and management of public sector deposits.

1.1 Open Market Operations

Sterilization via open-market operations usually takes place through the central bank sale of high yield domestic assets—either government or central bank securities—for low-yielding reserves. This type of sterilization has two main advantages. First, it reduces the monetary-credit expansion generated by the purchase of foreign currency without increasing the burden on the banking system of higher reserve requirements. Second, by limiting the role of the banking system in intermediating the flows, it reduces the bank's vulnerability to sudden reversal of flows. However, open-market operations tend to increase domestic interest rates. This happens if domestic assets issued in the sterilization operation are imperfect substitutes for other domestic currency assets investors want to hold or if the demand for money increases as a result of higher growth or lower inflation. Consequently, this type of sterilization has three disadvantages. First, it induces further capital flows through the increase in domestic interest rates. Second, it alters the composition of capital flows, reducing the share of FDI and increasing the share of short-term and portfolio flows (Montiel and Reinhart, 1997). Third, it raises quasi-fiscal costs by widening the domestic and foreign interest rate spread.

These disadvantages, together with the persistence of capital flows in the 1990s, make open-market operations a short-term policy option. Still, they have been the most popular policy response to capital inflows across regions. Virtually all countries have undertaken open-market policies in the 1990s, and used them for most of the inflow period (Table 7). The intensity of open-market operations has varied substantially across countries and across time. For example, capital inflows were almost fully sterilized in Chile during the first half of 1990, Indonesia during 1991–92, Malaysia from mid-1991 through early 1993 and Sri-Lanka in 1991–93. Chile reduced the intensity of sterilization by mid-1990.[15] Nonetheless, as was the case in Korea, Mexico, the Phillippines, and Thailand, open-market operations were maintained through much of the inflow period to sterilize a fraction of the inflows (Folkerts-Landau and Ito, 1995).

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[15] In late 1991 Colombia also reduced the intensity of the sterilization policy carried out during most of that year. However, the accumulation of international reserves in 1991 was the result of a surplus in the current account rather than of capital inflows. Therefore, in contrast to other countries, sterilized intervention was no longer the main policy used in Colombia when inflows began to arrive at the end of 1992 (Steiner, 1995).

Table 7. Policy Responses to Surges in Private Capital Flows in 20 Countries

Response	Argentina	Brazil	Chile	Colombia	Hungary	India	Indonesia	Korea	Malaysia	Mexico
Magnitude of the surge (net private capital flows as percentage of GDP) [1]	2.8	3.0	5.8	4.8	14.8	1.8	1.8	2.3	9.4	5.3
Policy response										
Reduce net inflows of foreign exchange										
Controls on inflows		x	x	x		x	x		x	x
Liberalize capital outflows			x	x		x		x	x	x
Liberalize trade			x	x		x	x	x	x	x
Reduce official borrowing			x		x					
Float/appreciate exchange rate			x	x						
Reduce impact on monetary aggregates										
Sterilized intervention		x	x	x		x	x	x	x	x
Higher reserve requirements			x	x		x		x	x	
Reduce impact on aggregate demand										
Fiscal contraction	x		x			x	x	x	x	x

Response	Morocco	Pakistan	Peru	Philippines	Poland	Sri Lanka	Thailand	Tunisia	Turkey	Venezuela
Magnitude of the surge (net private capital flows as percentage of GDP) [1]	3.5	3.6	6.4	4.3	6.5	5.5	9.9	5.1	3.0	2.7
Policy response										
Reduce net inflows of foreign exchange										
Controls on inflows						x	x			
Liberalize capital outflows		x		x		x	x			
Liberalize trade		x		x		x	x			
Reduce official borrowing	x			x			x	x		x
Float/appreciate exchange rate				x						
Reduce impact on monetary aggregates										
Sterilized intervention		x		x		x	x			
Higher reserve requirements				x		x				
Reduce impact on aggregate demand										
Fiscal contraction				x			x			

Source: The World Bank, (1997).

[1] This is the annual average for the surge period.

1.2 Reserve Requirements

An increase in reserve requirements reduces the money multiplier. Hence, it also offsets the monetary expansion associated with central bank intervention in the foreign exchange market. This policy has the advantage that it decreases the capacity of banks to lend without the quasi-fiscal costs caused by open-market operations. But increasing reserve requirements also has several shortcomings. First, it reverses the trend of financial liberalization in developing countries, hampering efficient allocation of credit. Second, if maintained for a long time, high reserve requirements promote disintermediation. As a consequence, funds are shifted to the nonbank financial sector and the desired effect of avoiding monetary expansion is not achieved. Finally, and similar to open-market operations, this type of sterilization policy stimulates further capital inflows. In fact, reserve requirements induce borrowing from abroad because they are a tax to the financial system that is transferred, at least in part, to bank clients through an increase in loan rates.

Despite the disadvantages, countries have attempted to reduce the money multiplier during capital inflow periods using this type of sterilization policy. Increases in general reserve requirements on domestic policy deposits were implemented in Korea (1988–90), Malaysia (1989–94), the Philippines (1990), and Sri Lanka (1991–93). Sri Lanka, Chile, and Peru also increased or imposed marginal reserve requirements on foreign currency deposits of the financial sector (Folkerts-Landau and Ito, 1995).[16] However, the policy is better understood as a form of capital control since it aims at discouraging a particular class of financial liabilities rather than restraining overall lending. Among countries with higher reserve requirements, money multipliers fell during the capital inflow period in Korea and Malaysia; were stable in the Phillippines, Colombia, and Sri Lanka; and increased in Chile (Montiel, 1995).

1.3 Management of Public Sector Deposits

This type of sterilization policy shifts deposits of the public sector or pension funds from the banking sector to the central bank. If government deposits are counted as part of the money stock, the policy is equivalent to a reserve requirement of 100 percent on this kind of deposit. If they are not counted as part of the money stock, the policy is similar to an open-market operation with the difference that the central bank does not have to pay interest on its deposits as it would on its sterilization bonds, thus avoiding quasi-fiscal implications. Contrary to reserve requirements, management of public sector deposits has the advantage of not taxing the financial sector. Nevertheless, the policy is not without its drawbacks. In particular,

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[16] An increase in marginal reserve requirements on domestic liabilities to banks is another form of this type of sterilization policy that could be used to sterilize the accumulation of reserves. Colombia followed such a policy in 1991. Nevertheless, in 1991 the accumulation of reserves was caused by a surplus in the current account rather than by capital inflows.

shifting deposits as a tool for further sterilization is limited by the availability of eligible funds. In addition, large and unpredictable changes in banks deposits make it difficult for banks to manage their cash positions.

This policy has not been used extensively. Countries that have sterilized capital flows by shifting deposits of the public sector to the central bank are Malaysia in 1989, 1990, 1992–94; the Philippines in 1992 and 1994; Thailand between 1987 and mid-1992; Singapore and Taiwan province of China (Folkerts-Landau and Ito, 1995).

2. Nominal Exchange Rate Flexibility

If policymakers want to avoid the expansion of monetary aggregates associated with capital inflows, they can reduce international reserve accumulation by allowing the nominal exchange rate to appreciate. This countercyclical policy has several virtues. First, it insulates the money supply from the inflows. The greater the exchange rate flexibility, the larger will be the insulation of the money supply and the autonomy of monetary policy. This advantage is particularly desirable when the flows are perceived to be reversible and supervision of the financial system is poor. Second with exchange rate flexibility the appreciation of the real exchange rate is likely to occur through a nominal appreciation rather than through higher inflation. Given the links between the nominal exchange rate and inflation, the latter is likely to be lower when the former is allowed to appreciate. Third flexibility in the nominal exchange rate introduces uncertainty, which can discourage speculative short-term capital inflows.

However, if the nominal exchange rate is allowed to appreciate, the profitability of the traded goods sector will suffer. Strategic sectors, such as nontraditional exports, will be damaged if capital flows are persistent and real exchange rate appreciation appears to be permanent. Still, even if capital flows are temporary, the real exchange rate will be volatile. This might have negative effects on the tradable goods sectors through different channels. First, if the real exchange rate appreciation is sufficiently large, it might induce hysteresis in the trade balance, altering the steady state real exchange rate (Calvo, Leiderman and Reinhart, 1996). Second, the tradable goods sector will be negatively affected if financial sectors are insufficiently developed and, thus, do not provide enough instruments to hedge against real exchange rate volatility (Khan and Reinhart, 1995).[17]

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[17] Another disadvantage associated with a greater flexibility of the nominal exchange rate arises in economies where it plays the role of a nominal anchor. This role has been prominent in stabilization programs where the credibility of the anchor has been enhanced with institutional arrangements. In this context, even if the appreciation of the nominal rate could help the authorities' anti-inflationary commitment, it could convey the signal that the exchange rate is not immutable (Montiel, 1995).

Although no country abandoned a predetermined peg for a free-floating regime during the capital inflow of the 1990s, almost all countries allowed greater variability of the nominal exchange rate. In general, to reduce the risks associated with a pure float and the costs associated with accumulation of international reserves, several countries adopted "flexibly managed" exchange rate systems. Among the Asian countries, Indonesia widened the intervention band in 1994, and Malaysia and the Phillippines allowed greater variability of the exchange rate since 1992. In addition, after significant exchange rate intervention in 1991 and 1992, Korean authorities announced their intention to widen the margins for daily exchange rate fluctuations (Folkerts–Landau and Ito, 1995). In Latin America, Peru also adopted a "dirty floating," in which the central bank intervenes to avoid excessive fluctuations in the nominal exchange rate. On the other hand, Mexico, Chile, and Colombia introduced crawling exchange rate bands, a regime that could be characterized as an intermediate case between fixed and flexible exchange rates.

In practice, nominal exchange rate appreciation has been more common in Latin America than in East Asia. Although Korea in 1987–89, Malaysia in 1993, and the Philippines in 1992 experienced small nominal appreciations, the largest revaluations occurred in Chile in 1994 (in excess of 9 percent) and in Colombia in 1994 (5 percent and 7 percent in January and December, respectively). In Chile and Colombia, the appreciation of the nominal exchange rate was triggered when the authorities realigned the exchange rate band. Other Latin American countries that experienced nominal appreciations are Bolivia in 1991, Costa Rica in 1992, and Mexico in 1991 (Montiel, 1995).

In summary, countries attaching lower weight to competitiveness than to reduced inflation will either use the exchange rate as a nominal anchor or increase nominal exchange rate flexibility. This was the case in many Latin American countries, where the weight given to price stability needs to be viewed in the context of the stabilization plans being enacted when capital inflows began to occur. However, using the exchange rate as an anchor or as an instrument of short-run stabilization can lead to persistent and large misalignments, threatening the sustainability of the regime and stimulating speculative attacks. Still, the stabilizing role of the nominal exchange rate can be particularly useful if fiscal policy is inflexible.

3. Fiscal Policy

The third countercyclical policy is to tighten the fiscal stance, especially public expenditures, to lower aggregate demand and to reduce the inflationary impact of capital inflows. This policy has several advantages. It avoids the costs associated with the different types of sterilization policies. In addition, fiscal restraint is a substitute for exchange rate flexibility as a stabilization device. A cut in public expenditure is likely to limit the appreciation of the real exchange rate since nontradable goods often represent a significant share of public expenditures. Reducing the pressures on the real exchange rate has several benefits. It induces

smaller current account deficits. Moreover, it favors investment over consumption since the former is more tilted toward traded goods than the latter. In turn, this is likely to induce faster economic growth. However, fiscal contraction is not always flexible enough to respond to fluctuations in capital movements. After all, fiscal tightening requires changes in legislation and implies sensitive political actions that cannot be undertaken on short notice. Furthermore, the use of fiscal policy as a countercyclical tool can be questioned if it implies that long-term goals related to taxes and expenditures are abandoned.

Given the inflexibility of fiscal policy, few countries have used fiscal restraint during the inflow period. In Latin America, only Chile, from mid-1990 to at least 1995, tightened the fiscal stance by increasing the value-added tax and corporate taxes while restraining expenditures. Other countries in this region, such as Argentina and Mexico, also adopted fiscal austerity measures during the inflow period. But this policy is associated more with the stabilization plans being carried out than with a countercyclical response to the inflows. In contrast to Latin America, most East Asian countries used fiscal tightening to overcome the expansion in aggregate demand arising from capital inflows. In fact, tightening occurred in Indonesia (1990–94), Malaysia (1988–92), the Philippines (1990–92) and Thailand (1988–93) (Folkerts-Landau and Ito, 1995, and Montiel, 1995). The benefits of fiscal policy were remarkable. As can be seen in Tables 4 to 6, countries that followed this policy had real depreciation of the exchange rate and larger increases in economic growth. This was the case, for example, in Thailand, Chile, Indonesia, and Malaysia.[18]

Beyond the role and benefits of fiscal contraction as an instrument for short-run stabilization, some observers have argued that the fiscal stance should become more conservative in the face of increased financial integration (Heller, 1997, The World Bank, 1997). Indeed, in the context of high financial integration, the direction and magnitude of capital flows become very sensitive to perceptions of domestic public solvency. If the long-run fiscal stance of the government is uncertain, short-run policy changes will be used by economic agents as information on the government's long-run intentions. This limits the flexibility of fiscal policy in the short run because the government will be concerned about the possibility of giving the wrong signals. Thus, achieving a reputation for fiscal conservatism will maximize the government's short-run policy flexibility during inflow periods.

Preemptive tightening of fiscal policy under the presence of volatile capital flows is also important because it helps insulate core revenues and expenditures from being adjusted following macroeconomic shocks. Moreover, even if the fiscal stance has to be tightened further in face of large and volatile capital flows, the required changes will be smaller. This is an important virtue given the inflexibility of fiscal policy in the short run. Another advantage

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[18] Growth also had a sharp acceleration on Argentina, Hungary, Peru and Poland. However, as mentioned in the previous section, this was the consequence of changes in the policy regime that also contributed to a dramatic decline in inflation.

of reducing the size of the fiscal response is that it avoids significant adjustments to taxes and expenditure programs that could hamper economic and social objectives. In case fiscal tightening is unavoidable, the proposed measures should be easy to manipulate and as distortion free as possible. In particular, measures such as increasing sales taxes and excises and cutting expenditures in areas linked to capital flows could be relatively successful (Heller, 1997).

B. Structural Policies

1. Trade Policy

During a period of capital inflows, trade liberalization could reduce the appreciation of the real exchange rate through two channels. First, like tight fiscal policy, it diminishes the pressure on the domestic economy by shifting expenditure to tradable goods (Corbo and Hernandez, 1996). Second, trade liberalization could help restrict the net inflow of foreign exchange. However, the efficacy of trade policy is controversial. In fact, both theory and evidence suggest that the impact of trade liberalization on the trade balance is ambiguous (Montiel, 1995).[19] Furthermore, liberalizing the current account might induce further capital inflows if it increases foreign investors' confidence in domestic macroeconomic management.[20] More generally, since trade liberalization is a structural policy, it should be designed to be consistent with long-term objectives rather than as a countercyclical response (Khan and Reinhart, 1995). Still, in a sample of 20 countries affected by capital inflows in the 1990s, 11 of them liberalized the current account (see Table 7).

2. Banking Supervision and Regulation

Although countries experiencing banking crises have been associated with increases in the current account deficit, real exchange rate appreciation, and excess consumption and underinvestment, an appropriate macroeconomic stance is insufficient to secure a sound

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[19] In theory, trade liberalization does not necessarily deteriorate the trade balance. Its effect is ambiguous, depending on the structural characteristics of the domestic economy and the nature of the liberalization program. If, for instance, temporary tariffs on intermediate goods are reduced and tradables are more intensive in both intermediate and capital goods than nontradables, a liberalization program will increase saving and reduce investment, and the trade balance will improve.

[20] If trade policy aims at reducing real exchange rate appreciation through export subsidies, it entails fiscal costs. Although these costs could be compensated through import tariffs, the latter would imply higher economic distortions and a deviation from the worldwide trend toward commercial opening (Calvo, Leiderman, and Reinhart, 1994).

financial sector. Three additional elements are required to reduce the vulnerability of the financial sector.

First, a sound financial sector requires adequate internal governance. After all, banks' managers and owners have the main responsibility for oversight of these institutions. Moreover, poor internal governance has been an important factor behind several cases of unsoundness. Second, market discipline can be reinforced when creditors strengthen bank's incentives to operate safely and soundly, exerting discipline on the bank's activities and forcing the exit of poor managers, owners or of the entire bank. The third element is banking supervision and regulation (Lindgren, García, and Saal, 1996).

Banking regulation and supervision become crucial elements if there are failures in internal governance and market discipline. They reinforce the operating environment, strengthen internal governance, and improve market discipline. The operating environment is reinforced with well-designed controls limiting entry into the banking industry and the scope of banking. Internal governance is strengthened when regulations promote fit and proper owners and managers, require owners to put their own capital at risk, and implement appropriate loan valuation and classification practices and supporting accounting standards. Finally, market discipline is improved when regulation ensures that market participants have as much information as possible to judge the soundness of banks, and that sanctions imposed by the market are taken (Lindgren, García, and Saal, 1996).

A key problem with market regulation and supervision is that financial institutions can easily avoid them. In most developing countries prudential regulation can be evaded through on balance sheet operations that artificially increase banks' regulatory capital position. Moreover, the surge of enormous offshore OTC derivative markets has increased the methods of evasion. To reduce the possibility of avoiding regulations requires stringent, comprehensive surveillance across the corporate structure of a financial and industrial group and a switch to risk-accounting principles (Garber, 1996).

Given that even in industrial countries such comprehensive surveillance is still not well formulated, some observers are skeptical of the role that market regulation and supervision can play in volatile financial markets. They suggest that it is more efficient to increase reserve requirements to control growth of liquidity than to strengthen regulation and supervision to control risk in the financial institutions issuing liquid liabilities. This view, however, goes counter to financial liberalization and discourages reliance on market forces for efficient allocation of credit. In addition, empirical evidence suggests that countries with high reserve requirements do not necessarily display a low ratio of liquidity to monetary base (Rojas-Suárez and Weisbrod, 1995).

Despite the limitations of banking supervision and regulation, this policy becomes particularly important to reduce the vulnerability of the financial sector during capital inflows

associated with lending booms and unsustainable surges in asset prices. In fact, as pointed out in Section IV, countries with the highest increase in bank lending were usually those that later experienced a banking crisis. In addition, countries in which the credit boom did not lead to financial crisis were those that had strengthened their banking systems. Several indicators can be used to evaluate if a banking system has been strengthened.

First, a high capitalization rate, measured as the stock of capital relative to the stock of bank assets, indicates that the system is sounder. Indeed, an increase in the capitalization rate reduces the likelihood that banks could default on their borrowing if investment projects fail to reduce the vulnerability caused by capital inflows. Second, a rise in provisions made for future losses (as a share of the stock of total loans) reduces the probability of banking crisis if borrowers default on their loans. Third, high liquidity of bank assets indicates that the financial system is less vulnerable to liquidity crises. Finally, shorter maturity of liabilities relative to assets indicates that liquidity crises are more likely to occur.

Taking these indicators into account, the World Bank (1997) shows that Chile, Colombia, and Malaysia strengthened their banking systems during the capital inflow and lending boom period. In Chile this was reflected mainly in higher liquidity of bank assets. In Malaysia the improvement was the result of higher capitalization, and in Colombia it reflected tighter regulations that forced banks to increase their capitalization and provisioning. In contrast, the health of the financial sector deteriorated in Argentina, Brazil, Mexico, and Venezuela during the early 1990s; in Sweden during the mid-to late 1980s; and in Chile in the early 1980s. Finally, a third group of countries strengthened some aspects of their banking systems while other indicators indicated a deterioration of banking sector health: Indonesia during the 1990s, Malaysia in the early 1980s, and Thailand in both the 1980s and the 1990s.

C. Policies Designed to Reduce Net Capital Inflows

1. Capital Controls

In general, in an economy suffering from distortions, capital controls can improve welfare.[21] Accordingly, a wide literature has been developed justifying capital controls as a "second best" solution and, in the presence of multiple equilibria, as a tool to attain the first-best equilibrium. Traditionally, the effectiveness of capital controls has been defended using two arguments. First, because capital controls drive a wedge between domestic and external interest rates, they are seen as a tool for helping authorities to gain control over domestic monetary conditions when the exchange rate is fixed or managed. Second, countries with

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[21]As noticed by Dooley (1996), it would be better to remove the existing distortion than to introduce another to reduce the damage produced by the first.

capital controls typically have higher rates of inflation, higher revenue from inflation, and lower real interest rates than countries without controls. In such countries, capital controls are seen as tools to maintain government revenues associated with financial repression and to reduce government debt service costs. Still, if they are used to support inconsistent monetary and exchange rate policies, they become ineffective in preventing balance of payments crises. (For a review on capital controls, see Dooley, 1996.)

In face of large capital inflows and the trend toward financial liberalization, capital controls have recently served a different purpose than in the past. Rather than to avoid nominal devaluations of the exchange rate, they have been implemented to reduce nominal and real appreciations of the exchange rate. In addition, in this decade capital controls aim at diminishing pressures on aggregate demand, whereas in the past the purpose was to avoid low medium-term growth caused by declines in investment and consumption after capital outflow. Although capital flows in either direction complicate monetary policy, capital controls seek to reduce monetary and credit expansions during inflow periods. In contrast, during outflows episodes, they try to avoid high interest rates that could strain the financial system. Finally, in the 1990s the adoption of capital controls could be seen as a precautionary measure. They reduce the destabilizing effects associated with the inflows and, by doing so, avoid the traumatic effects associated with outflows (Reinhart and Smith, 1996).

Restrictions on capital mobility fall into two basic categories. The first uses quantitative controls to regulate the volume of capital flows, whereas the second applies explicit taxes (i.e., a transaction tax) or tax-like measures (i.e., a noninterest-bearing reserve requirement on foreign borrowing). In the past, quantitative measures were implemented mainly to prevent outflows and were associated with administrative controls. They required extensive bureaucracy, provided incentives for evasion, and interfered with international trade (Eichengreen and Wyplosz, 1996). However, in the 1990s the main purpose of quantitative controls has been similar to that of explicit taxes or tax-like measures—to reduce the volume of flows and, in particular, to target short-term capital that is perceived as volatile and destabilizing.

In this decade, quantitative limits on inflows have taken different forms in a wide variety of countries and with varying degrees of success. For example, in 1992 Mexico limited foreign currency liabilities of commercial banks to 10 percent of their total loan portfolio. However, this measure did not succeed in reducing the size of the inflows because the banks' total loan portfolios were expanding rapidly and the initial share of loans in foreign currency was below the 10 percent limit.

Another example of a country introducing quantitative limits on inflows is Malaysia. In face of speculative flows associated with speculative short-term bank deposits, in January 1994 Malaysia imposed six measures to restrict inflows. As announced by the authorities,

these were temporal controls. Among them, one prohibited domestic residents from selling short-term money market instruments to foreigners. Contrary to the Mexican experience, this measure, combined with the abandonment of sterilization, succeed in reducing domestic interest rates and short-term inflows. Still, this policy could have jeopardized the competitiveness and development of the financial sector if maintained for a long time. Finally, other types of quantitative controls have taken the form of prudential limits on, or even prohibition of, nontrade-related swap activities, off-shore borrowing, and banks' net open-market foreign exchange position. This was the case in Indonesia, Malaysia, the Phillippines, and Thailand (Folkerts-Landau and Ito, 1995).

As argued above, the second category of restrictions to capital mobility consists of explicit taxes or tax-like measures. The simplest example of an explicit tax would be the worldwide implementation of a tax on foreign exchange trading or on short-term cross-border bank loans. This proposal to "throw sand in the wheels of international finance," commonly known as the Tobin tax, was imposed by Brazil in 1993 on some classes of foreign exchange transactions. These were expanded in 1994 but scaled back in response to the Mexican crisis in 1995 (Montiel, 1995).

The Tobin tax has several advantages. It increases the autonomy of domestic monetary policy, reduces the likelihood of speculative attacks on fixed exchange rate regimes, and encourages long-term investment rather than short-term speculative opportunities. But this type of capital control has several shortcomings. First, to be effective it would need to be adopted worldwide; otherwise, the taxed activities would shift to untaxed countries. Second, if banks do not have large position taking, it will not be effective to penalize short-term cross-border bank loans. Third, taxation of foreign exchange transactions becomes difficult given the increasing possibility of creating synthetic positions. Fourth, the Tobin tax would reduce trading and could lead to less liquid markets, thus contributing to greater volatility in international capital markets (Folkerts–Landau and Ito, 1995).

Nonremunerated reserve requirements to be deposited at the central bank on liabilities in foreign currency associated with direct borrowing by firms are an example of tax-like measures used to regulate the volume of capital flows. This type of capital control seems to promote long-term capital inflows and to discourage short-term flows. This policy is based on the popular perception that long-term flows are more guided by medium-term fundamentals and are less sensitive than short-term flows to cyclical fluctuations in domestic or international interest rates.[22] In addition, the policy discourages short-term inflows because they are associated with rapid expansion in short-maturity bank deposits. Consequently, if the banking

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[22]However, as argued in section II, Claessens, Dooley, and Warner (1995) found no statistical support for the argument that long-term flows are less volatile and easier to predict than short-term flows.

sector is inefficient or poorly supervised, the authorities have an incentive to reduce the role played by banks in intermediating the flows. Chile and Colombia have used this form of capital control. In Chile, for example, the reserve requirement is 30 percent for one year, while in Colombia, the reserve requirement is to be maintained for 18 months and applies to loans with a maturity of five years or less,[23] with the percentage of requirement declining as maturity lengthens.

The effectiveness of capital control on outflows, such as the types of controls introduced recently in Malaysia, tends to be quickly lost as individuals find ways of avoiding controls (Mathieson and Rojas-Suárez, 1993). Moreover, in the case of tax-like measures, the effectiveness of controls crucially depends on the degree of intertemporal substitution. In fact, even if controls are designed as a temporal measure by the government, their desired macroeconomic effect will be attained only if the tax is very high because of the presence of a low intertemporal elasticity of substitution (Reinhart and Smith, 1996).

Although in the 1990s capital controls had little effect on consumption, the current account, and the real exchange rate, they were capable of either reducing the overall volume of inflows, altering their maturity profile, or both. This suggests that the lack of effectiveness of capital controls is not symmetric and that they may be more effective in controlling inflows than in stopping outflows. Indeed, in Chile, the Czech Republic, and Malaysia the capital account shrunk by 7.6, 3.5, and 15.1 percentage points, respectively, in the year controls were introduced. Furthermore, capital controls had the desired effect of lengthening maturities in Chile, Colombia, and Malaysia, where short-term capital inflows declined sharply (Reinhart and Smith, 1996, Cardoso and Goldfajn, 1998). This is an important policy outcome. Indeed, as noticed in section II.B, in light of the Mexican and Asian crises, the short maturity of debt has been identified as a main determinant of the volatility and reversals of capital flows.

2. Encouragement of Gross Outflows

If the purpose of capital controls is to reduce the volume of net inflows, removing outflows restrictions could attain the same result. Nevertheless, this policy might attract additional inflows. In particular, if controls on outflows happen to be effective, they would make inflows irreversible, leading creditors to refrain from lending if they are uncertain about the return on loans to domestic agents. Consequently, the removal of controls on outflows would eliminate this irreversibility, stimulating further inflows.

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[23]Except for trade credit with a maturity of six months, loans to finance imports of capital goods, credits to finance investment abroad, and credit cards.

If capital controls are used to maintain government revenues associated with financial repression, their removal could also increase capital inflows because they could be interpreted as a signal that this type of taxation will not be used in the future. This argument also suggests that encouraging gross outflows should be one of the last steps in economic liberalization and requires fiscal stability (Montiel, 1995). As with trade liberalization, encouraging gross outflows is a structural policy that should be designed so as to be consistent with long-term objectives rather than as a countercyclical response.

Encouraging gross outflows has taken different forms across countries. Private inflows were successfully offset by a reduction in flows from official creditors in Chile, India, Indonesia, Morocco, the Phillippines, Sri Lanka, Thailand, and Tunisia (Table 5). In Chile, Indonesia, and Thailand this behavior reflected the policy decision of accelerating the repayment of external debt (the World Bank, 1997). On the other hand, Korea relaxed controls on capital outflows by promoting foreign investment by domestic residents, while Thailand, Chile, and Colombia removed several restrictions on capital outflows. Among the measures were those that explicitly allowed residents to invest abroad, that removed restrictions on repatriation of capital and interest by foreign direct investors, that eliminated export surrender requirements, and that eliminated ceilings on tourist expenditures by residents, and others (Montiel, 1995).

D. Policy Mix and Sequencing

No policy recipes can ensure the best use and the most sustained inflow of capital. Successful policy responses have varied across countries and have not relied on a single instrument. It is not surprising that policy responses differed across countries, since several factors condition the appropriate policy response in a particular country. Among them, it is possible to mention: the host country's anti-inflationary record, the openness of the economy to foreign trade, the state of public finances, the size and liquidity of the domestic bond market, the health of domestic banks, the flexibility of fiscal policy, and the quality of the regulatory and supervisory framework over the financial sector (Goldstein, 1995).

Some of the risks associated with capital inflows can be mitigated through the careful sequencing of appropriate policies. Successful policy responses used monetary policy in the early stages of the inflow period. However, as inflows persisted and the costs associated with the different types of sterilization were realized, countries began to rely on nominal exchange rate flexibility. In several cases, the costs of the appreciation of the real exchange rate were mitigated with the imposition of capital controls to moderate the volume of the inflows and lengthen their maturities.

In the presence of structural forces driving capital inflows, the role of fiscal restraint becomes crucial. It avoids the costs associated with the different types of sterilization policies, it is a substitute for exchange rate flexibility and thus limits the appreciation of the real exchange rate. However, few countries have relied on fiscal policy because it is usually too inflexible to be an effective tool for responding to fluctuations in capital movements. Still, in countries where the fiscal stance was tightened the real exchange rate depreciated and larger economic growth was observed. This was the case, for example, in Thailand, Chile, Indonesia, and Malaysia.

Finally, experience in several countries shows that individual policies interact in significant ways. First, they can interact to produce unintended effects on the composition of capital inflows. In particular, a combination of a pegged exchange rate, sterilized intervention, and absence of capital controls on financial flows will likely maximize the volume of short-term capital inflows. The Mexican experience from 1990 to 1993, and Thailand in the period leading up to the 1997 crisis, are good examples of the unintended effects of this policy mix. Second, policies can interact to undercut the policies' individual effectiveness. For example, the high interest rate differentials that usually accompany sterilization might produce an incentive to circumvent capital controls and, if successful, will offset the contractionary effects of the sterilization efforts. Similarly, liberalizing controls on outflows might attract additional inflows if the liberalization is interpreted as a positive signal about the future economic environment, or if domestic rates are high relative to international levels (Reinhart and Reinhart, 1998).

VI. Policy Lessons

Although the rate of growth and eventually the levels of private capital flows might decline in the future, several forces will help maintain them in high levels. Indeed, capital flows appear to have reached a new phase characterized by strong structural forces. Two developments in the financial structure of capital-exporting countries in particular have increased the responsiveness of private capital to cross-border investment opportunities. First, falling communication costs, competition, and increased costs in domestic markets have led firms in industrial countries to look for higher efficiency and profits by producing abroad. Second, institutional investors are more willing and able to invest abroad because of higher expected interest rates of return in developing countries and to wider opportunities of risk diversification.

Major reversals in capital flows will continue to be a threat if lack of confidence in domestic macroeconomic policies emerges. Balance of payments crises will arise as a consequence of both financial vulnerabilities and "flow" type disequilibria, like current account

and fiscal deficits. In addition, as countries become more integrated, the recent volatility and contagion effects associated with private capital are likely to increase. After all, contagion effects occur through five channels: trade arrangements, the "wake up" phenomenon, herding behavior, financial links between countries, and liquidity management practices of open-end mutual funds.

Except for pressures in the current account, recipient countries have been able to avoid symptoms of macroeconomic overheating associated with capital inflows such as acceleration of economic growth and inflation. Moreover, since the appreciation of the real exchange rate experienced in some countries was not caused by an acceleration of inflation, the appreciation seems to be associated more with the use of the exchange rate as a nominal anchor than with overheating. Nonetheless, an important lesson derived from the Asian crisis in 1997 is that widening current account deficits causes severe vulnerabilities even if these deficits are not the consequence of public sector dissaving and/or consumption booms—in many cases, private sector debt is assumed by the public sector, and low-quality investment does not contribute to future productive capacity and repayments of the external debt.

Still, capital flows increased bank lending and were accompanied by a surge in asset prices. Although not all countries that experienced a credit boom ended up with weaker financial systems, countries with the highest increase in bank lending were usually those that later experienced a banking crisis and had higher macroeconomic vulnerability. Moreover, the presence of microeconomic distortions has exacerbated the impact of capital flows in the economy. In particular, the boom-bust cycle can be amplified by price and wage rigidities, asymmetric information in the banking sector or at the international level, inadequate supervision and regulation of financial institutions, shallow capital markets, and reforms—credible or non-credible reforms.

Two points regarding the association of financial liberalization with financial crises require special emphasis. First, internal and external financial liberalization expose threats to financial stability through the same mechanisms: they squeeze margins and allow financial intermediaries to have additional access to risky investments. Second, however, it is not financial liberalization that is at the root of the problem but rather the inadequacy of prudential supervision and regulation. There is thus an important role for policies that encourage adherence to world-class standards for accounting, auditing, and information disclosure; that facilitate enforcement of sound rules of corporate governance; and that protect investors and lenders from fraud and unfair practices (Eichengreen and Mussa, 1998).

Successful policy responses have varied across countries, have relied on more than a single instrument, and used monetary policy in the early stages of the inflow period. However, as inflows persisted and the costs associated with the different types of sterilization were realized, successful policies began to rely on nominal exchange rate flexibility. In several

cases, the costs of the appreciation of the real exchange rate were mitigated with the imposition of capital controls to moderate the volume of the inflows and lengthen their maturities. Although evidence is not conclusive, it seems that capital controls had the desired effect of lengthening maturities in Chile, Colombia, and Malaysia, where short-term capital inflows declined sharply. This is an important policy outcome because the short maturity of debt was identified as a main determinant of the volatility and reversals of capital flows in the Mexican and Asian crises. Thus, an appropriate management of private sector debt—an issue largely ignored in the experience of the 1990s—might require innovative techniques such as prudential regulation or capital controls on inflows of short maturity.

Experiences in several countries show that individual policies can interact to produce unintended effects on the composition of capital inflows. In particular, the policy mix of a pegged exchange rate, heavy sterilization, and no capital controls to discourage short-term flows can explain the change in the composition of capital inflows in the period leading up to the Asian crisis. Indeed, in 1994 and 1995, Asian countries, most notably Thailand, increasingly started to attract short term flows. Consequently, there was a decline in the share of foreign direct investment and portfolio investment in total private flows (Figure 5).

In the presence of structural forces driving capital inflows, the role of fiscal restraint becomes crucial. In fact, it avoids the costs associated with the different types of sterilization policies, it is a substitute for exchange rate flexibility, and thus it limits the appreciation of the real exchange rate. Few countries, however, have relied on fiscal policy because it is usually too inflexible to be effective in responding to fluctuations in capital movements. But in countries where the fiscal stance was tightened the real exchange rate depreciated and the economy experienced larger growth.

Beyond the role and benefits of fiscal contraction as an instrument for short-run stabilization, a conservative fiscal stance should play a central role in the face of increased financial integration. In the context of high financial integration, the direction and magnitude of capital flows become very sensitive to perceptions of domestic public solvency and limit fiscal flexibility during inflow periods. Moreover, during periods of volatile capital flows, preemptive tightening of fiscal policy is important because it helps insulating core revenues and expenditures from being adjusted following macroeconomic shocks. In addition, even if the fiscal stance has to be tightened further in the face of large and volatile capital flows, the required changes will be smaller. This is an important virtue since fiscal policy is inflexible in the short run and because it avoids significant adjustments to taxes and expenditure programs that could hamper economic and social objectives.

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