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Capital inflows to Latin America with reference to the Asian experience

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This essay has four objectives. The first is to document the current episode of capital inflows to Latin America based on data for ten Latin American countries. 6 The second is to compare the Latin American experience with that of a number of Asian countries that have also been the recipients of sizable capital inflows and examine to what extent the nature of the capital inflows and macroeconomic consequences are similar in the two cases. The third is to assess the role of external factors in accounting for the observed capital inflows and the real exchange rate appreciation in Latin America. Last, the chapter discusses the implications of capital inflows for economic policy

Introduction

The revival of substantial international capital inflows to Latin America is perhaps the most visible change in the economic situation of the region during the past two years. Whereas capital inflows to Latin America average about $8 billion a year in the second half of the 1980s, they surged $24 billion in 1990 and to $40 billion by 1991. Of the latter amount, 45 percent went to Mexico, and most of the remainder went to Argentina, Chile, Colombia, and Venezuela. Interestingly, capital is returning to most Latin American countries despite the wide differences in macroeconomic policies and economic performance between them. In most countries, the increased capital inflows have been accompanied by an appreciation in the real exchange rate, booming stock and real estate markets faster economic growth, an accumulation of international reserves, and a strong recovery of secondary market prices for foreign loans.

Without doubt, an important part of this phenomenon is explained by the fundamental economic and political reforms that have recently taken place in a number of these countries, including the restructuring of their external debts. Indeed, it would have been difficult to attract foreign capital in the magnitudes mentioned here without these reforms. Nevertheless, while domestic reform is a necessary ingredient for capital inflows, it only partially explains Latin America's forceful reentry in international capital markets. Domestic reforms alone cannot explain why capital inflows have occurred in countries that have not undertaken reforms or why they did

not occur, until only recently, in countries where reforms where introduced well before 1990.

This chapter maintains that some of the renewal of capital inflows to Latin America is due to external factors, and can be considered as an external shock common to the region. We argue that falling interest rates, a continuing recession, and balance-of-payments developments in the United States have encouraged investors to shift their resources to Latin America to take advantage of renewed investment opportunities and the increased solvency of that region. 1 Taking into account economic developments outside the region helps to explain the universality of these inflows. The present episode may well be an additional case of financial shocks in the center that affect the periphery, of the type stressed by Diaz Alejandro in several of his contributions. 2
International capital inflows affect the Latin American economies in at least four dimensions. 3

First, they increase the availability of capital in the individual economies and allow domestic agents to smooth out their consumption over time and investors to react to expected changes in profitability.

Second, capital inflows have been associated with a marked appreciation of the real exchange rate in most of the sample countries. The larger transfer from abroad has been accompanied by an increase in domestic absorption. If some of the increase in spending falls on the

non traded good, its relative price will increase - the real exchange rate appreciates.

Third, capital inflows have an impact on domestic policy making. The desire by some central banks to attenuate the degree of real exchange rate appreciation in the short run frequently leads them to intervene actively and purchase from the private sector part of the inward flow of foreign exchange. Moreover, the attempt to avoid domestic monetization of these purchases has often led the monetary authorities to sterilize some of the inflows. The extent to which the inflows are sustainable is also of concern to the authorities. The history of Latin America gives reason for such concern: The major episodes of capital inflows, during the 1920s and 1978-81, were followed by major economic crises and capital outflows, such as in the 1930s and the debt crisis in the mid-1980s.4

Fourth, capital inflows can provide important - yet ambiguous - signals to participants in world financial markets. An increase in the inflows can be interpreted as reflecting more favorable medium- and long-term investment opportunities in the receiving country. But capital may also pour in for purely short-term speculative purposes, so-called hot money, to a country where lack of credibility of government policies leads to high nominal returns on domestic financial assets. Although it remains to be seen which of these two motives is dominant in the present episode, the strong recovery in secondary market prices of bank claims on several of these countries (see Calvo, Leiderman, and Reinhart 1993) and various other indicators

of country risk provide at least partial signals in support of the first, more

favorable, motive.5

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of capital inflows to Latin America based on data for ten Latin American

countries. 6 The second is to compare the Latin American experience

with that of a number of Asian countries that have also been the recipients

of sizable capital inflows and examine to what extent the nature of the

capital inflows and macroeconomic consequences are similar in the two

cases. The third is to assess the role of external factors in accounting for

the observed capital inflows and the real exchange rate appreciation in

Latin America. Last, the chapter discusses the implications of capital inflows

for economic policy. The chapter is organized as follows. Section 2

deals with the basic concepts and the relationship between capital inflows,

the accumulation of reserves, and the gap between national saving and

investment. The stylized facts about capital inflows to the region are documented

in Section 3, which includes a comparison with several Asian

countries.7 Section 4 provides a quantitative assessment of the role of external

factors on the accumulation of reserves and on the real exchange

rate appreciation in the ten countries considered. The implications of capital

inflows for domestic economic policy are discussed in Section 5.

2. The accounting of capital flows

       International capital flows are recorded in the nonreserve capital account

of the balance of payments (BOP). This account includes all international

transactions with assets other than official reserves, such as transactions

in money, stocks, government bonds, land, factories, and so on. When a

national agent sells an asset to someone abroad, the transaction enters his

country's balance of payments as a credit on the capital account and is

regarded as a capital inflow. Accordingly, net borrowing abroad by domestic

agents or a purchase of domestic stocks by foreigners is considered as

a capital inflow, which respectively represents debt and equity finance.

The simple rules of double-entry accounting ensure that, up to statistical

discrepancies, the capital account surplus or net capital inflow (denoted

by *KA)* is related to the current account surplus (denoted by *CA)*

and to the official reserves account (denoted by *RA)* of the BOP through

the identity:

$CA + KA + RA = 0$ [8]

A property of the current account is that it measures the change in the

economy's net foreign wealth. A country that runs a current account deficit

must finance this deficit either by a private capital inflow or by a reduction

in its official reserves. In both cases the country is running down its

net foreign wealth. Another characteristic of the current account is that

national income accounting implies that its surplus is equal to the difference

between national saving and national investment *(CA = S - I).* Accordingly,

an increase in the current account deficit can be traced to either

an increase in *I,* a decline in *S*, or any combination of these variables that

results in an increased investment-savings gap. Finally, the official reserves account records purchases or sales of official reserve assets by central banks. Thus, this account measures the extent of official foreign exchange intervention by the authorities, and is often referred to as the official settlements balance or the overall balance of payments.

The foregoing discussion indicates that there are two polar cases of central bank response to increased capital inflows. If there is no intervention, the increased net exports of assets in the capital account are financing an increase in net imports of goods and services _ capital inflows would *not* be associated with changes in central banks' holdings of official reserves. At the other extreme, if the domestic authorities actively intervene and purchase the foreign exchange brought in by the capital inflow, the increase in *KA* is matched, one-to-one, by an increase in official reserves. In this case, there is no change in the gap between national saving and national investment, nor is there any change in the net foreign wealth of the economy. The capital inflow would be perfectly correlated with changes in reserves.

3 Stylized facts

In this section we quantify some of the key aspects of capital inflows to Latin America and the related underlying macroeconomic developments. 9   Last, we elaborate on the roIe of external developments, especially those in the United States.

Anatomy of capital inflows

Table 13.1 presents a breakdown of Latin America's external accounts. It can be seen that a substantial fraction of the capital inflows have been channeled toward an accumulation of international reserves. In countries like Chile and Mexico, an important part of the inflows has financed investment ; in countries like Argentina and Brazil there has been a marked rise in private consumption.

Table 13.1. *Latin America: balance of payments, 1973–91*

Year	Balance on goods, services, and private transfers[a]		Balances on capital account[a]		Balance on capital account plus net errors and omissions[a]		Overall balance[b]	
	$ billion (1)	% of GDP (2)	$ billion (3)	% of GDP (4)	$ billion (5)	% of GDP (6)	$ billion (7)	% of GDP (8)
1973	−4.7	−2.4	—	—	8.5	4.4	3.8	2.0
1974	−13.5	−5.3	—	—	13.3	5.2	−0.2	−0.1
1975	−16.3	−6.1	—	—	14.7	5.5	−1.6	−0.6
1976	−11.8	−3.8	—	—	16.9	5.4	5.1	1.6
1977	−11.6	−2.7	19.8	4.6	16.4	3.8	4.8	1.1
1978	−19.4	−4.0	30.5	6.2	27.4	5.6	8.0	1.6
1979	−21.7	−3.8	35.0	6.2	32.9	5.8	11.2	2.0
1980	−30.3	−4.3	47.0	6.7	34.0	4.9	3.7	0.5
1981	−43.5	−5.5	59.4	7.4	41.9	5.3	−1.6	−0.2
1982	−42.2	−5.5	45.1	5.9	23.0	3.0	−19.2	−2.5
1983	−11.6	−1.7	22.4	3.2	13.6	1.9	2.0	0.3
1984	−3.2	−0.5	15.5	2.3	12.5	1.8	9.3	1.4
1985	−4.4	−0.6	6.7	0.9	5.5	0.8	1.1	0.2
1986	−18.9	−2.6	14.2	1.9	12.3	1.7	−6.6	−1.0
1987	−12.0	−1.6	14.5	1.9	15.3	2.0	3.3	0.4
1988	−12.4	−1.5	8.2	1.0	4.7	0.6	−7.7	−0.9
1989	−10.0	−1.1	15.7	1.7	12.1	1.3	2.1	0.2
1990	−8.8	−0.8	24.1	2.3	23.9	2.3	15.1	1.4
1991	−22.3	−2.1	38.1	3.8	39.8	3.9	17.5	1.7

[a]A minus sign indicates a deficit in the pertinent account. Balance on goods, services, and private transfers is equal to the current account balance less official transfers. The latter is treated in this table as external financing and is included in the capital account.
[b]Column (7) equals the sum of columns (1) and (5). A positive sign in column (7) indicates accumulation of international reserves by the monetary authorities.
Source: IMF, *World Economic Outlook,* various issues.

Table 13.2. *Latin America: items in the capital account*
(in billions of U.S. dollars)

Year	Net external borrowing	Nondebt creating flows	Asset transactions (net)[a]	Errors and omissions[a]	Total
1973	6.0	2.5	—	—	8.5
1974	11.1	2.2	—	—	13.3
1975	11.4	3.3	—	—	14.7
1976	14.2	2.7	—	—	16.9
1977	19.4	2.8	−2.5	−3.4	16.4
1978	28.0	4.9	−2.5	−3.1	27.4
1979	30.2	7.2	−2.4	−2.1	32.9
1980	43.1	6.8	−3.0	−13.0	34.0
1981	61.0	8.2	−8.9	−17.5	41.9
1982	45.7	7.2	−7.7	−22.1	23.0
1983	18.7	4.6	−0.9	−8.8	13.6
1984	14.1	4.5	−3.1	−3.0	12.5
1985	6.2	6.1	−5.4	−1.4	5.5
1986	11.3	4.3	−1.3	−1.9	12.3
1987	10.0	6.0	−1.2	0.5	15.3
1988	3.8	8.8	−4.3	−3.5	4.7
1989	10.9	6.9	−2.1	−3.6	12.1
1990	28.0	8.6	−12.5	−0.2	23.9
1991	17.3	14.1	6.7	1.7	39.8

[a]These two categories are included in net external borrowing and nondebt creating flows from 1973–76.
Source: Data for Western Hemisphere, IMF, *World Economic Outlook,* various issues.

As Table 13.2 reports, the increase in net external borrowing accounts for

70 percent of the capital inflow in 1990-91. This is primarily due to borrowing

by the pnvate sector from foreign private banks.13 Increased external bor~

rowing reflects the restoration of access to voluntary capital market financing

following the crisis. 14 There were also increases in portfolio investment

and foreign direct investment. The latter amounted to about $12

billion, which was the result of privatizations.15

Since there has been a substantial degree of central bank intervention

in the face of capital inflows, there is an important degree of comovement

between international reserves and capital inflows. In fact, if one is interested in

monthly developments, for which direct data on capital inflows are not

available, changes in reserves are a reasonable proxy for these inflows.

Figure 13.1, which depicts monthly data on official international reserves for

the countries in our sample, shows that, for most of the countries, there is

a pronounced upward trend in the stock of official reserves starting from

about the first half of 1990. In 1991, reserves accumulation accelerated as

the monetary authorities in most countries reacted to the capital inflows

by actively increasing their purchases of foreign assets constituting international

reserves.

Figure 13.2 provides evidence on the behavior of the real effective exchange

rates during this period.17 With the exception of Brazil, all countries

in our sample are experiencing a real exchange rate appreciation since

January of 1991. In half of the cases the real appreciation of the domestic

currency began before January 1991. Thus, the increase in capital inflows

has been accompanied by a real exchange rate appreciation. This important

link between capital flows and the real exchange rate in small open

economies is already documented in the empirical literature (see Edwards

1989). Combining the evidence from Figures 13.1 and 13.2 indicates that

there is an important degree of comovement in reserves and real exchange

rates across countries, despite the wide differences in policies and institutions

among them.

Rates of return differentials and other macroeconomic developments

Expected rates of return on available assets across countries playa key
role in investors' decisions on whether to move capital internationally.
Since data for expected returns are not readily available, and depend on
how one models expectations, we first look at the stylized facts in the form
of ex-post returns. As shown in Figure 13.3, there was a large increase in
the U.S. dollar stock prices of major Latin American markets in 1991.18
Argentina exhibits the biggest single annual return of almost 400 percent,
while Chile and Mexico registered returns of about 100 percent eachY
According to Salomon Brothers, $850 billion of foreign investment entered
Brazil's stock market in the last four months of 1991, and about $600
million was invested by foreigners in the Argentine equity market in
1991.20 However, as the figures indicate and Figure 13.3 confirms, the stock
market booms and the attendant high returns appear to materialize after
capital has begun to flow into the region. It would thus be difficult to
argue that high stock market return differentials were responsible for attracting
the first wave of capital inflows.

ARGENTINA

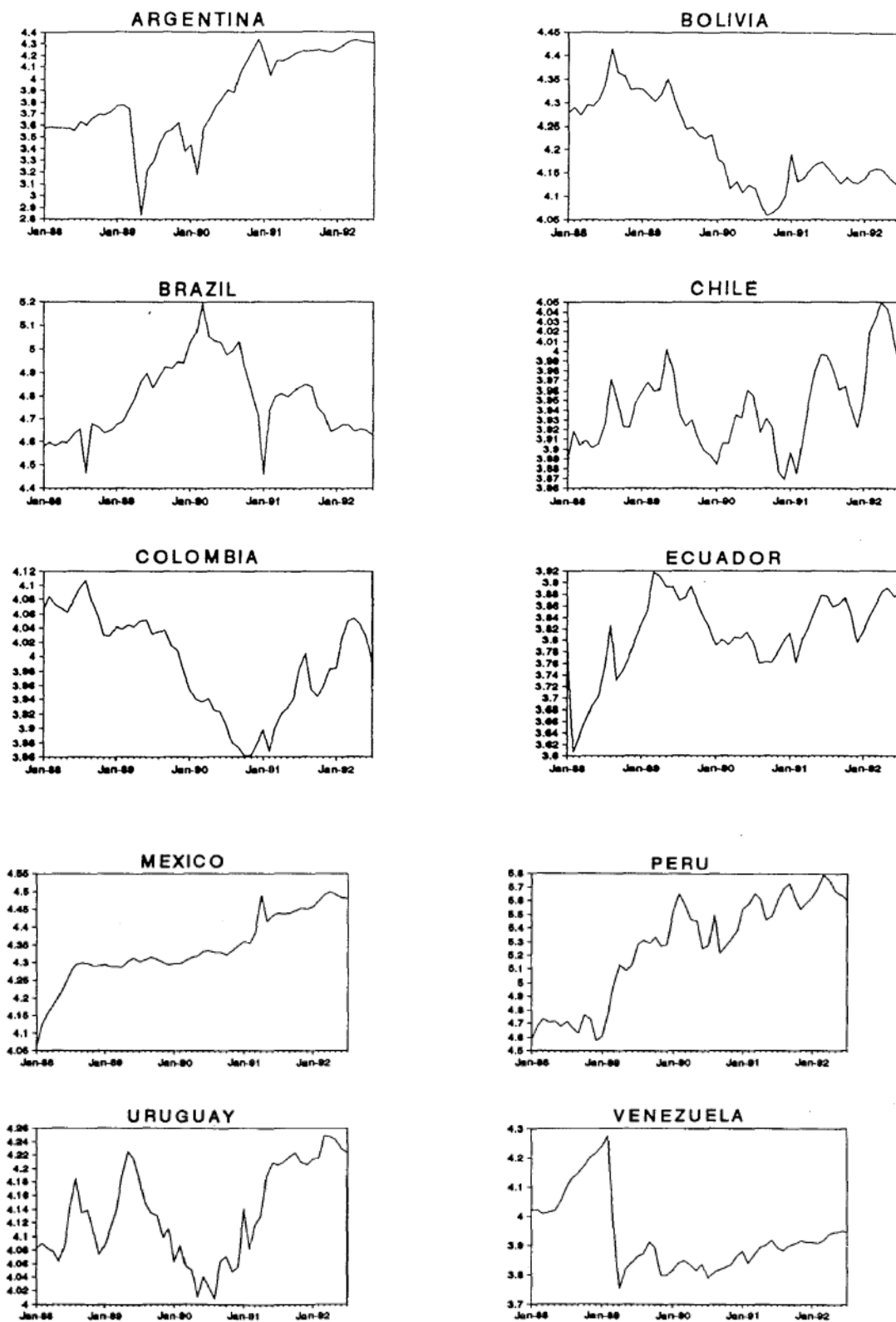BOLIVIA

BRAZIL

CHILE

COLOMBIA

ECUADOR
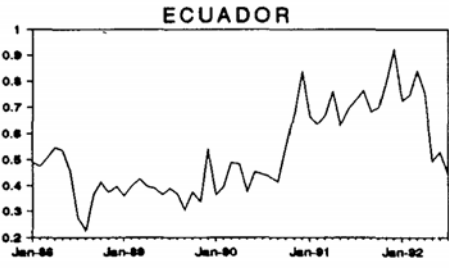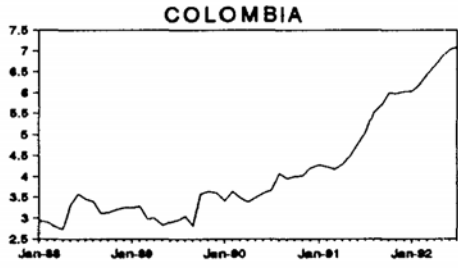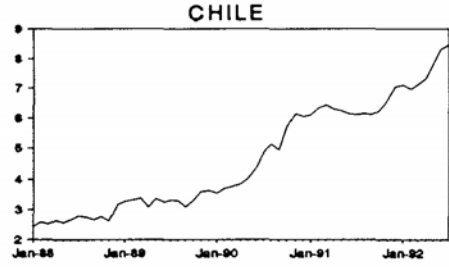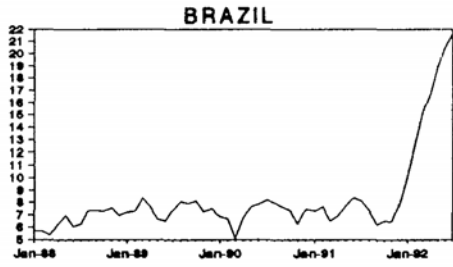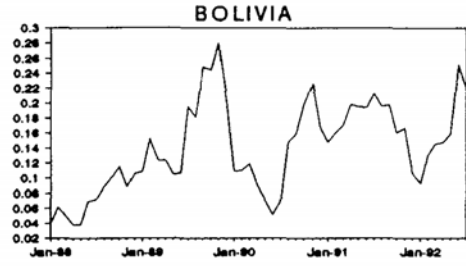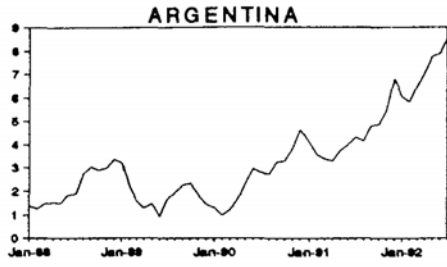
Figure 13.2. Latin America: real effective exchange rate, January 1988–July 1992. *Note:* An increase in the index denotes a real exchange rate appreciation. *Source:* IMF, Information Notice System.
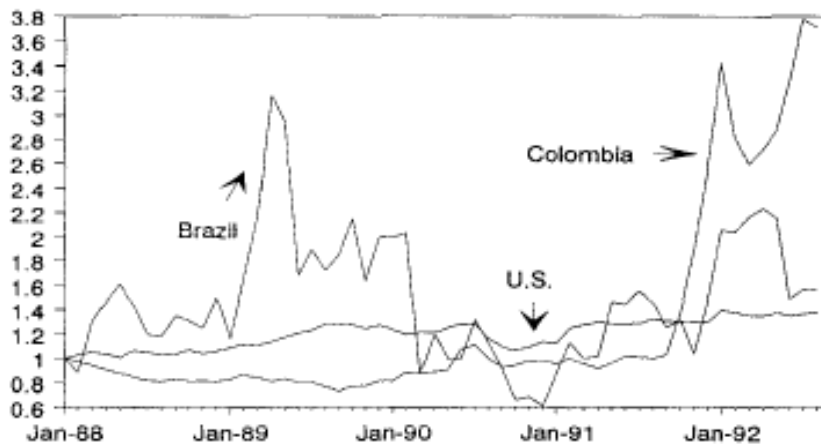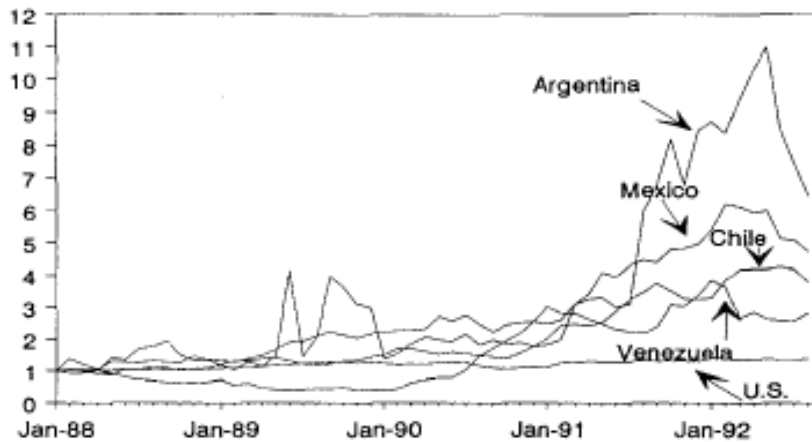
Figure 13.3. Stock market performance, January 1988–August 1992 (stock price indexes in U.S. dollars, January 1988 = 100). *Note:* The S & P 500 index was used for the United States. *Sources:* Standard & Poor's and International Finance Corporation, *Quarterly Review of Emerging Stock Markets.*

Figure 13.4 provides evidence on the lending and deposit interest rate spreads between U.S. dollar equivalent domestic interest rates and interest rates in the United States. Because in some of these countries interest rates are regulated, and capital mobility is imperfect, spreads across the various countries cannot be compared in a straightforward manner. In addition, domestic interest rates vary markedly from country to country, as shown

in Figure 13.4, with Argentina and Peru having the broadest ranges and

Bolivia and Colombia the narrowest. With these caveats in mind, the dominant

impression from Figure 13.4 is that of relatively high interest differentials

in Latin America in the 1990-91 period. It is also evident from

Figure 13.4 that the pattern of spreads varies considerably across countries.

In effect, this is not surprising since the monetary authorities in these

countries have not reacted in a uniform manner to the capital inflows, and

the timing of regulatory changes has also varied considerably across the

sample countries. Although the relatively high differential rate of return

on Latin American assets has been associated with a marked rise in capital

inflows to the region, the inflows have not arbitraged away the large

differentials. In some countries, such as Argentina, the interest rate differential

decreased sharply as capital poured in; yet in others, such as Chile,

there was a less pronounced response of the interest rate differential to the

inflows (see Figure 13.4). As argued in Section 5, these different patterns

may reflect cross-country differences in the authorities' choices between

sterilized and nonsterilized intervention.

  In sum, three main stylized facts emerge with regard to interest rate

differentials. First, there is little comovement in domestic interest rates (in

U.S. dollars), and hence in spreads, across the countries in our sample,

Second, as illustrated in Calvo, Leiderman, and Reinhart (1993), the

"noise-to-signal ratio" of the domestic dollar rates varies substantially

across countries. Countries offering the highest returns also had the greatest

volatility of returns.21 Third, despite the capital inflows the positive

differentials have not been fully arbitraged away.

Consider how developments in 1991, the year when capital inflows grew

to about $40 billion, differ from those in earlier years. First, as Table 13.3

shows, there was a renewal of economic growth. After three years of stagnation,

real GDP increased by almost 3 percent in 1991. However, gross

capital formation as percent of GDP remained constant at about the same

level of the second half of the 1980s, suggesting a more efficient utilization

of resources. At the same time, there was a marked drop in the rate of

inflation (which nevertheless remained at a three-digit level for the region),

and a significant reduction in central government fiscal deficits. The

changing economic conditions in Latin America are also reflected in the

region's debt and solvency indicators. At $441 billion, external debt

amounts to 2.6 times exports of goods and services. Although still high,

this ratio has decreased markedly from the 3.5 figure in 1986. Since most

of Latin America's external debt to commercial banks is still in terms of

floating rates, the drop in short-term u.s. interest rates and the drop in

the debt to exports ratio has translated into a rapid decline in the external

debt service ratio over the past two years. In fact, the level of the debt

service ratio in 1991 is of the same order of magnitude as the levels observed

before the debt crisis. These developments represent only part of

the changing environment in Latin America of the early 1990s.In addition

to these, the move toward privatization and deregulation, the introduction

of financial reforms, and the restructuring of existing external debt have

all contributed to bringing Latin America back on the list of viable investment

locations in world financial markets.

A comparison with the Asian experience

Latin America has not been the only region receiving sizable capital inflows

in recent years. In effect, capital began to flow to Korea in 1988 and

to a broader number of Asian countries sometime in 1989. Developments

outside the region are frequently credited for the flow of capital to a group

of countries that are, by and large, pursuing very diverse policies and have

considerable differences in their macroeconomic environment. Specifically,

it is argued that declining profit margins in Japan and in the United

States have induced Japanese, and, to a lesser extent, American firms to

reallocate to areas where lower wages prevail. In addition, during 1988-89

a number of the emerging stock markets in Asia outperformed U.S. and

Japanese stock markets by considerable margins, 22

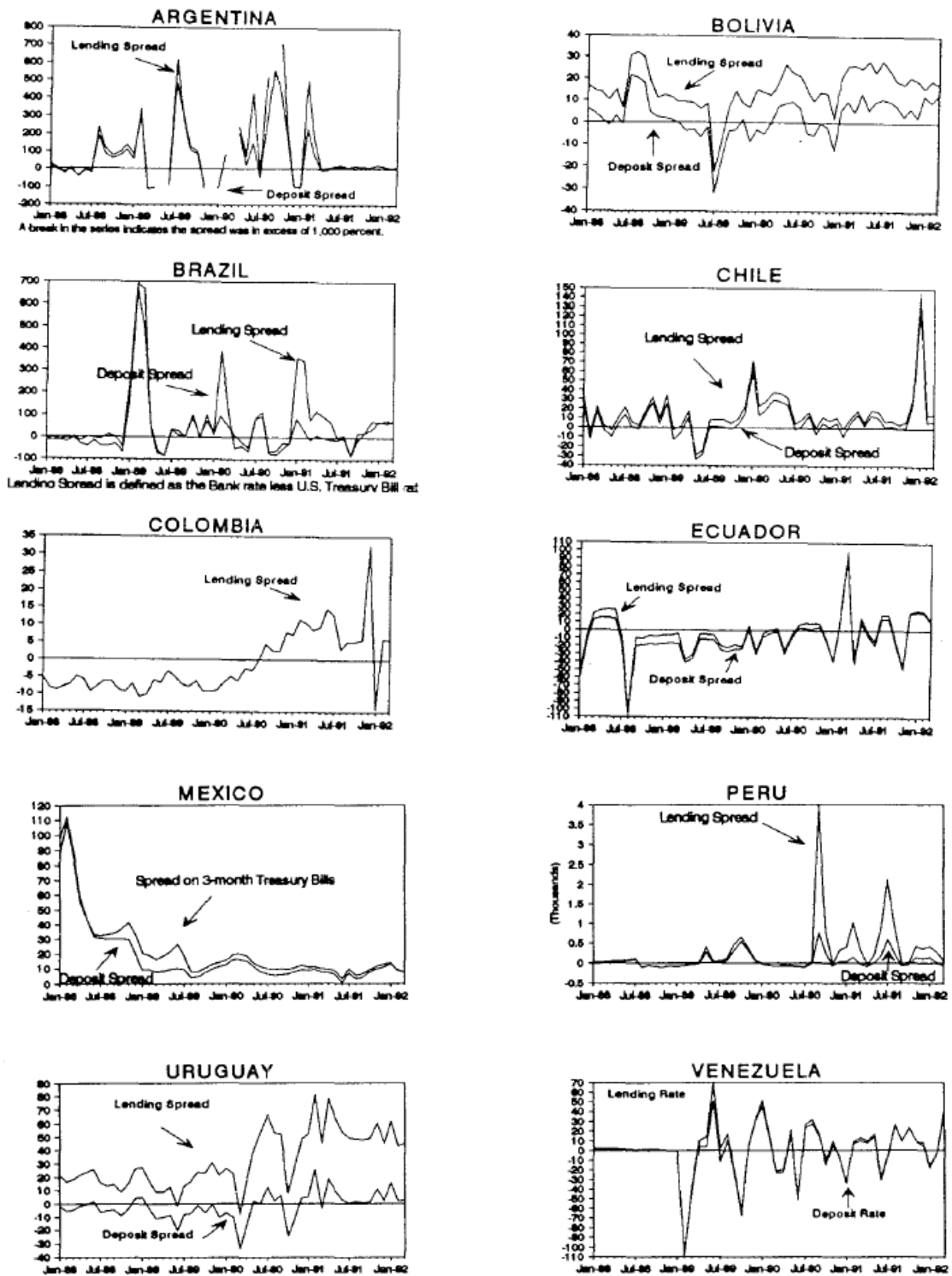Figure 13.4. Interest rate spreads, January 1988–March 1992 (dollar equivalent of domestic rate less U.S. rate, annual rates). *Note:* Deposit spreads are based on interest rates on certificates of deposit, while lending spreads are rates charged by banks less the interest rate on U.S. commercial paper. *Source:* IMF, *International Financial Statistics,* and various central bank bulletins.

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Table 13.3. *Latin America: macroeconomic indicators*

Year	Growth of real GDP (% change)	Gross capital formation (% of GDP)	Consumption[a] (% of GDP)	Inflation (%)	Central govt. fiscal balance (% of GDP)	Commodity prices (% change)	Terms of trade (% change)	External debt ($ billion)	External debt to exports (ratio)	Debt service (ratio)	Reserves ($ billion)	Reserves to imports (ratio)
1973	8.4	29.3	74.5	32.1	—	47.4	6.5	44.4	176.2	29.3	12.0	35.1
1974	6.9	24.4	75.8	37.5	—	20.9	−7.0	58.2	163.4	27.9	11.9	21.7
1975	3.1	24.7	77.7	52.0	—	−12.5	−7.5	68.6	195.8	32.2	10.0	17.5
1976	5.5	23.5	79.6	66.1	—	23.0	12.2	82.0	204.1	31.4	15.2	25.8
1977	5.3	25.1	79.0	49.9	−2.2	27.9	8.0	124.6	192.6	28.2	28.5	28.5
1978	4.1	24.8	78.6	41.9	−2.0	−12.6	−9.4	154.9	215.7	37.1	35.5	35.5
1979	6.1	23.2	79.6	46.5	−0.7	14.0	5.0	187.2	196.8	38.8	42.7	42.7
1980	5.3	23.7	79.7	53.7	−0.6	11.8	7.9	229.4	181.8	33.0	40.3	40.3
1981	1.0	23.0	79.7	58.2	−3.0	−15.3	−5.2	285.6	207.7	40.6	39.6	39.6
1982	−0.9	20.9	80.1	64.6	−4.0	−11.0	−5.0	325.5	264.7	50.4	28.1	28.1
1983	−3.2	17.9	81.2	98.6	−3.7	6.8	−2.7	340.2	286.0	40.7	29.3	29.3
1984	3.6	17.2	79.0	124.2	−4.1	−0.8	4.2	360.3	275.1	40.5	40.5	30.2
1985	3.4	18.4	76.2	128.2	−4.0	−8.3	−5.4	368.2	293.7	42.1	41.2	31.7
1986	4.3	18.2	78.9	79.4	−5.2	5.5	−10.2	381.9	347.9	46.1	33.3	25.6
1987	2.2	19.9	75.1	117.8	−7.0	−6.8	−5.4	419.1	341.4	38.5	38.0	27.7
1988	0.4	20.9	72.7	243.2	−5.8	21.2	−0.6	409.3	294.7	42.7	30.8	20.0
1989	1.0	19.6	72.6	434.2	−6.3	−2.3	0.2	406.9	262.2	30.2	33.0	19.4
1990	−0.1	19.6	77.0	647.8	−0.3	−7.2	−0.1	422.1	251.6	26.9	47.8	26.3
1991	2.9	20.7		162.5	−1.0	−5.6	−4.9	440.7	264.8	32.8	65.3	33.5

[a]This column includes private and government consumption.
Source: Data for Western Hemisphere, IMF, *World Economic Outlook* and *International Financial Statistics*, various issues.

Several interesting empirical regularities emerge from comparing the

Latin American and Asian experience. First, as Table 13.4 illustrates, the

swing in the balance on the capital account (as a percent of GDP) is of

the same order of magnitude for the two regions. For the Latin American

countries in our sample the change in the capital account amounts to 2.5

percent of GDP; for the Asian countries the capital account surplus widens

by 2.3 percent. Second, as is the case for most of the Latin American

countries, there is a marked accumulation of international reserves during

the capital inflow period of 1989-91 (see Figure 13.5). The sharp buildup

in international reserves in the eight Asian countries considered suggests

that, as in Latin America, the capital inflow was met with a heavy degree

of intervention on the part of the various monetary authorities. Third, as

mentioned previously, the various regional stock markets posted strong

gains during the early stages of the capital inflow period.23

There are, however, marked differences between Asia and Latin

America in the macroeconomic impact of the capital inflows. As Figure

13.2 illustrates, in Latin America the capital inflows have been accompanied

by a real exchange rate appreciation (the exception is Brazil); in Asia

such an appreciation is not the norm (Figure 13.6). The real exchange rate

appreciated markedly in Korea and more modestly in Singapore but for

the remaining countries no sustained appreciation is evident. As previously

argued, the larger transfer from abroad is accompanied by an increase

in domestic absorption. If some of the increase in spending falls

on the non traded good, its relative price will increase - the real exchange

rate appreciates.

Although the reasons why the real exchange rate responds differently

to the inward flow of capital in the two regions are likely to be numerous.,

important differences in the composition of aggregate demand may play

a key role in determining whether the real exchange rate appreciates or

not. As Table 13.4 summarizes, for the Asian countries investment as a

share of GDP increases by nearly 3 percentage points during the capital

inflows period.

By contrast, for the Latin American countries investment

falls slightly - the inflows primarily finance higher consumption. It has

often been the case for these countries that the increase in investment falls

primarily on imported capital goods. On the other hand, the increase in

consumption is less tilted toward the traded good. Other things equal, this

observation would suggest that a real exchange rate appreciation is more

likely when capital inflows finance consumption than when these finance

investment.24 Another element influencing the real exchange rate by

affecting both the level and composition of aggregate demand is the behavior

of public consumption.

Some of the Asian countries, most notably Malaysia and Thailand, reacted to the

capital inflows by sharply contracting fiscal expenditure.25 These expenditure cuts may

reduce or eliminate the real exchange rate pressures through two channels: First, the

fiscal contraction tends to reduce aggregate demand; second, public consumption

may be more biased toward the nontraded good than private sector consumption.26 Yet another reason that may explain why a real exchange rate appreciation failed to materialize was the conduct of monetary policy. While sterilization policies had limited success in reigning in monetary growth in a number of Latin American countries (see Section 5), these policies, which were often conducted by managing public sector savings, were more successful in achieving their objectives in several Asian countries (for a discussion of the experience of Indonesia, Malaysia, Singapore, and Taiwan, see Reisen 1993).Their relative success in limiting the acceleration in the growth of the monetary aggregates had a dampening effect on aggregate demand and limited pressures on the price of nontraded goods.

Another marked difference between Asia and Latin America is in the composition of capital inflows. Whereas in the Asian countries 40 percent of the increase in capital inflows came in the way of foreign direct investment, for the Latin American countries direct investment accounted for only 20 percent of the increase in inflows. This difference may help explain why concerns over "hot money" and a sudden reversal are more prevalent among Latin American policy circles than among their Asian counterparts_ It may also; in part, explain why the increase in investment is much greater for most of the Asian countries.

Table 13.4. *Key indicators for selected Latin American and Asian countries (As a percent of GDP)*

Latin America

	Argentina	Bolivia	Brazil	Chile	Colombia	Ecuador	Mexico	Peru	Uruguay	Venezuela	Average for 10 countries
Capital account											
1984–89	−1.6	0.6	−2.3	−1.7	2.0	−6.3	−0.4	−5.3	−2.5	−3.1	−2.1
1990–91	0.0	3.7	−1.1	4.1	0.9	−5.0	5.4	−0.7	0.3	−3.4	0.4
Direct investment											
1984–89	0.9	0.5	0.5	0.5	1.5	0.6	0.8	0.0	0.0	0.1	0.5
1990–91	1.9	0.9	0.1	1.9	1.1	0.8	1.4	0.1	0.0	2.2	1.1
Investment											
1984–89	11.1	5.4	17.2	16.0	18.5	19.2	18.6	19.6	11.0	16.5	15.3
1990–91	8.7	5.6	16.0	19.5	15.8	17.8	19.1	13.7	12.7	16.1	14.5
Public consumption											
1984–89	12.4	11.3	11.1	10.9	10.3	11.6	11.1	9.6	13.7	10.4	11.2
1990–91	13.6	11.8	12.9	8.9	10.7	8.4	9.9	9.0	13.3	11.3	11.0

Asia

	Indonesia	Korea	Malaysia	Philippines	Singapore	Sri Lanka	Taiwan	Thailand	Average for 8 countries
Capital account									
1984–88	2.2	−2.0	−0.4	−3.8	5.0	4.6	0.1	4.2	1.2
1989–91	4.6	0.8	6.1	2.0	3.9	4.8	−6.3	11.7	3.5
Direct investment									
1984–88	0.5	0.3	2.7	0.8	9.4	0.6	−0.3	0.8	1.8
1989–91	1.1	0.1	5.9	1.5	12.9	0.4	−2.2	1.7	2.7
Investment									
1984–88	23.8	28.9	26.0	18.3	38.9	23.0	19.3	21.8	25.0
1989–91	24.8	36.2	31.7	20.8	38.7	20.1	22.3	27.9	27.8
Public consumption									
1984–88	10.0	9.8	12.5	6.8	12.8	9.6	15.0	13.6	11.3
1989–91	10.4	9.6	9.0	7.9	10.8	10.1	16.0	10.1	10.5

Source: IMF, *International Financial Statistics;* Pfefferman and Madarasay; (1993); and IMF, *World Economic Outlook.*

External factors

Although it is difficult to point to a single dominant external factor that would account for the present capital inflows to Latin America, several external developments have converged to stimulate such inflows. First, there is the impact of the sharp drop in U.S. short-term interest rates, which are now at about half their level of two years ago and at their lowest levels since the early 1960s.By reducing the external debt service on floating rate debts, this decline in U.S. interest rates has improved the solvency of Latin American debtors. For a given level of interest rates in Latin America, these developments provide incentives for repatriation of capital held in the United States and for increases in borrowing by Latin American agents from capital markets in the United States.28
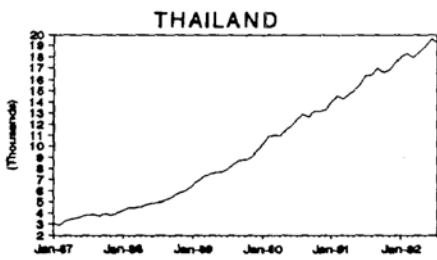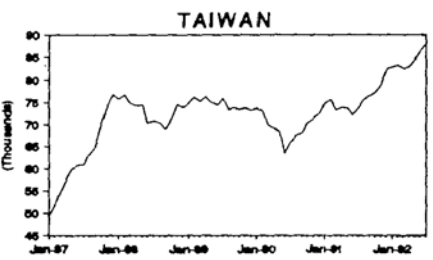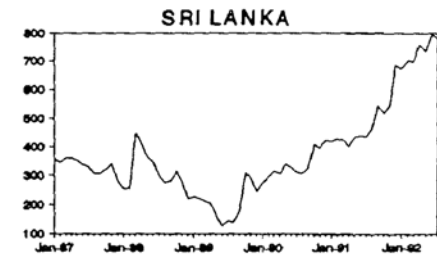
Figure 13.5. Asia: official reserves minus gold, January 1987–July 1992 (billions of U.S. dollars).
Source: IMF, *International Financial Statistics.*

25

Figure 13.6. Asia: real effective exchange rate, January 1987–July 1992. *Note:* An increase in the index denotes a real exchange rate appreciation. *Source:* IMF, Information Notice System.

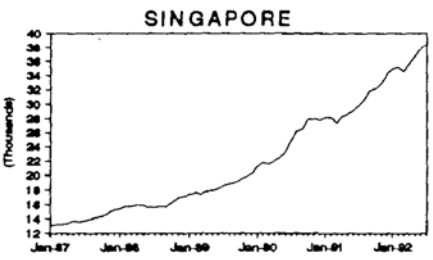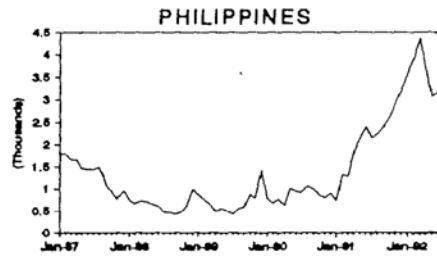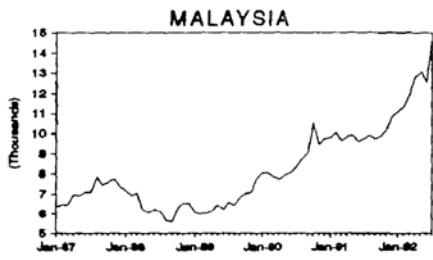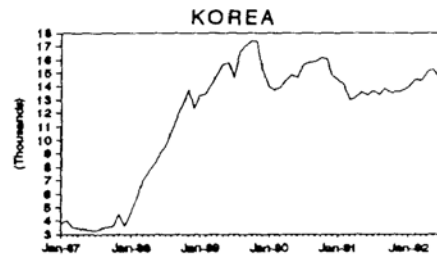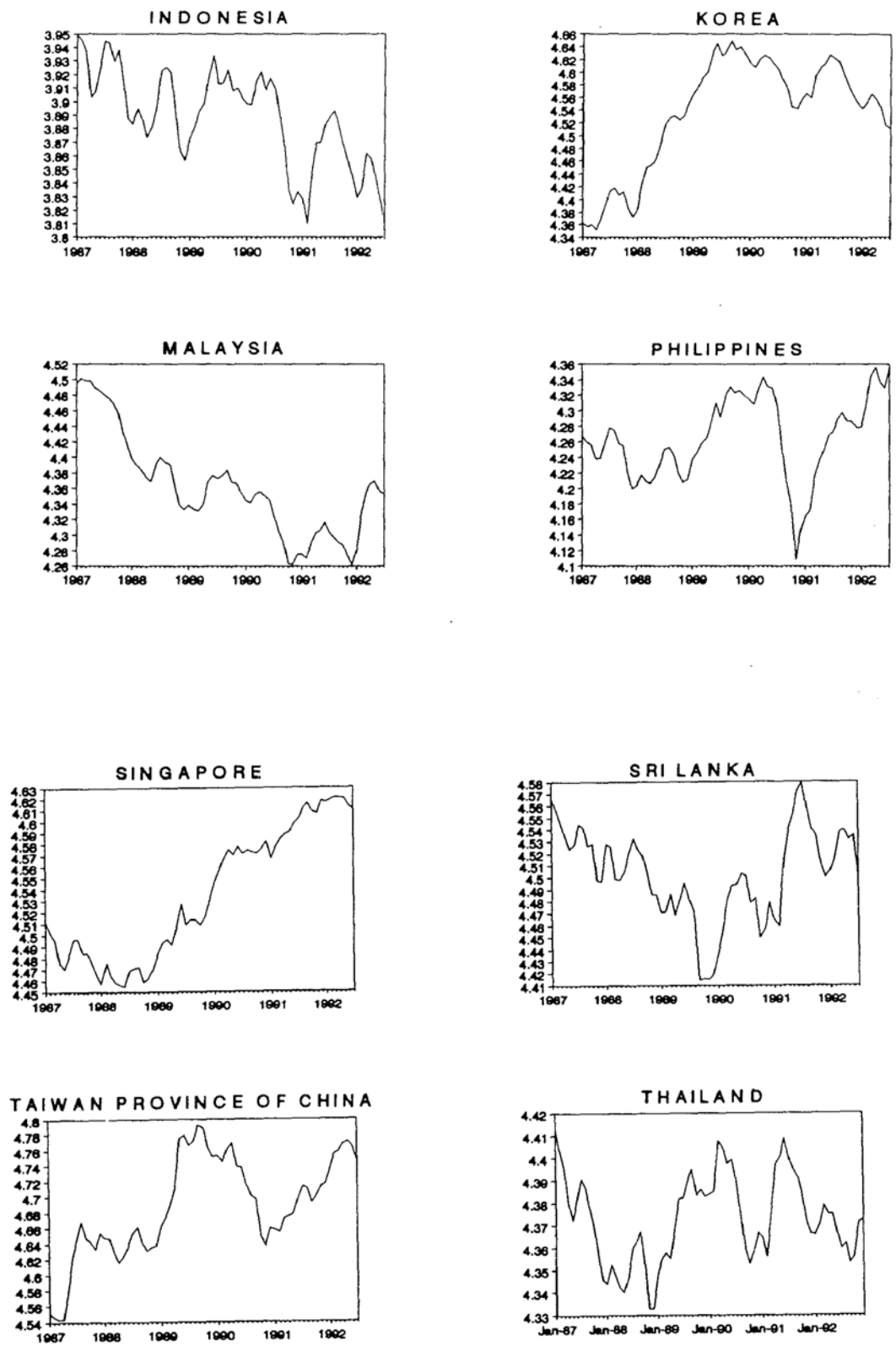Second, several external factors probably contributed to the increase in Latin America's current account deficit, and to the need to finance this deficit by increased capital inflows. Two such factors are the continuing recession in the United States and in other industrialized countries, and the continuation of the process of decline in Latin America's terms of trade throughout the past decade - which reflects mainly a decrease in the prices of petroleum and of other commodities. In principle, a decline in a given country's terms of trade can be expected to result in a larger current account deficit (the Harberger-Laursen-Metzler effect) and, in the absence of major intervention by the national authorities, in a larger capital inflow to finance this deficit. However, the changes in the terms of trade in 1990-91 are too small to account for the sharp increase in capital inflows. Thus it seems financial market shocks have played a larger role than terms of trade shocks in accounting for the capital inflows in the present episode.

Third, it is seen that during both recent episodes of capital inflows to Latin America - in 1978-82 and 1990-91 - there were sharp swings in the private capital account of the U.S. balance of payments in the form of increased outflows and reduced inflows (Table 13.5). In fact, 1990 and especially 1991 mark the first years of net capital outflows from the United States[29] after eight consecutive years of net inflows. As Table 13.6 documents; about 60 percent of the increased capital inflows in 1991 are directly associated with increased private capital outflows from the United States to Latin America, as recorded in the U.S. **BOP** accounts. Similarly,

the relatively large capital inflow of 1978-81 to Latin America was

matched by increased private capital outflows from the United States.31

Thus the data appear to support the notion that swings in private capital

outflows from the United States playa key role as external impulses that

affect the size of capital inflows into Latin America.

Table 13.5. *U.S. balance of payments (in billions of U.S. dollars)*

Year	Current account	Capital account	Capital account plus net errors and omissions	Overall balance
1973	7.07	−9.71	−12.30	−5.23
1974	1.94	−9.25	−10.75	−8.81
1975	18.06	−28.67	−22.71	−4.65
1976	4.18	−25.24	−14.68	−10.50
1977	−14.49	−18.46	−20.55	−35.04
1978	−15.40	−30.63	−18.08	−33.48
1979	0.20	−14.53	9.75	9.95
1980	1.20	−35.91	−10.26	−9.06
1981	7.26	−28.07	−8.50	−1.24
1982	−5.86	−28.79	7.89	2.03
1983	−40.18	24.72	36.13	−4.05
1984	−98.99	72.52	99.71	0.75
1985	−122.25	108.18	128.05	5.80
1986	−145.42	95.78	111.64	−33.78
1987	−162.22	98.68	105.36	−56.86
1988	−128.99	101.05	92.72	−36.27
1989	−106.41	104.91	123.34	16.93
1990	−92.16	−4.60	58.90	−33.26
1991	−8.66	−18.20	−21.30	−29.96

Source: IMF, *International Financial Statistics,* and U.S. Bureau of Current Business, *Survey of Current Business,* various issues.

Table 13.6 *Changes in capital accounts*
(in billions of U.S. dollars)

Periods compared	Private capital account of Western Hemisphere	Private capital account of U.S. with Western Hemisphere
1978–81 against 1976–77	17.4	−9.9
1983–89 against 1978–81	−24.4	30.1
1991 against 1983–89	30.1	−17.5

Note: Positive entries in column 1 indicate an increase in net private capital inflow to Western Hemisphere. A negative entry in column 2 indicates an increase in the net private capital outflow from the United States to the Western Hemisphere.

Fourth, in 1990 there were important regulatory changes in capital markets of industrial countries that reduced the transactions costs for agents accessing international capital markets from developing countries. 32

4 Role of external factors: econometric analysis

In this section, monthly data for ten Latin American countries covering the period January 1988 to December 1991 are used to analyze in more detail key features of the current episode of capital inflow. The analysis begins by establishing the extent of comovement of official reserves and real exchange rates between these countries, as these proxy for capita] inflow. We conduct a similar exercise for the Asian countries and compare the results. We then develop and estimate a model designed to provide a quantitative assessment of the relative importance of external shocks in the recent episode of reserves accumulation and real exchange rate appreciation.

Comovement of reserves and the real exchange rate

Given the lack of monthly data (and for a number of the countries in the sample, quarterly data) on capital inflows, we examine here the joint behavior of international reserves and the real exchange rate, two variables in the present episode that are closely associated with the inflows. The previous section revealed that there is an important degree of comovement in reserves and real exchange rates across countries, which could be interpreted as reflecting the effects of a common external shock to Latin American countries (Figures 13.1 and 13.2). Accordingly, a first task in this section is to quantitatively examine this issue by using principal component analysis. Principal component analysis provides a way of describing the comovement in data series.33 We begin with ten time series, reserves for each country, and construct a smaller set of series, the principal components, which explain as much of the variance of the original series as possible. 34 The higher the degree of comovement that exists among the original ten series, the fewer the number of principal components that will be needed to explain a large portion of the variance of the original series.35 The procedure begins by standardizing the variables, so that each series has a zero mean and a unit standard deviation; this ensures that all series receive uniform treatment and that the construction of the principal component indexes is not influenced disproportionately by the series exhibiting the largest variation.

For the Latin American countries we constructed the principal component

indexes for the period from January 1988 to July 1992. In addition,

for comparative purposes two subperiods are considered:]988-89 and the

capital inflows episode of 1990-92. As Figure 13.1 shows and the top panel

of Table 13.7 confirms, the extent of comovement in reserves during the

capital inflow period of]990-92 is considerable and higher than in the

preceding two years. The first principal component explains 71 percent of

the variation in reserves, while the second principal component explains

an additional 16 percent of the variation. Hence, 87 percent of the variance

of the ten reserves series is captured by two indexes, thus indicating

a sizable degree of comovement. More formally, we tested the null hypothesis

that the ten reserve series are linearly independent and found that we

could reject this hypothesis at standard significance levels.36

Applying the same procedure to the real exchange rate indicates that

the degree of comovement across countries in the region also has increased

in the recent capital inflows episode. The fraction of real exchange rate

variance explained by the first principal component during 1990-92 is 68

percent. The first two principal components explain a sizable 83 percent

of the variance of the real effective exchange rate.

As far as the increased covariation of reserves and the real exchange

rate in the recent period is concerned, it may well reflect the effects of an

external shock, common to the region, in the past two years. Interestingly,

when we examined the principal components of the domestic inflation

rate, a variable less obviously linked to external factors, we found that the

extent of covariation among the inflation rates of these ten countries had

diminished rather than increased in the recent period.37

The correlations between the first principal component of reserves and

the individual country reserve series tend to confirm the evidence in Figure

13.1. The regional index does quite well in accounting for reserve fluctuations

in eight of the ten countries. For the real exchange rate, the results

are also anticipated in Figure 13.2.38 The first principal components (plotted

in the top panel of Figure 13.7) could be interpreted as regional ex-

. change rate and reserves indexes, and as shown, the upward trend in the

two series reflects the common regional experience of a real exchange rate

appreciation and accumulation of reserves. Purged of country-specific

idiosyncracies, they could reflect the influence of unobservable external

factors common to the region as well as any coordinated internal developments

in the region.39

Applying the same methodology to the Asian data highlights some of the

differences as well as some of the similarities between the experience of the

two regions. As the bottom panel of Figure 13.7 shows, the pattern of comovement

in reserves is similar to that found for the Latin American countries,

with share of the total variation explained by the first principal component

increasing during the capital inflow period. Similarly, the bottom panel

of Figure 13.7 traces the "regional" reserve index and points to a sustained

accumulation of reserves. Bycontrast to the Latin American experience, the

degree of comovement in the real exchange rate during the capital inflow

period diminishes. Most important, as the bottom panel of Figure 13.7illustrates,

the regional real exchange rate index captures the pattern most prevalent

in Figure 13.6; namely, it highlights that the "regional" real exchange

rate remained fairly stable in the face of capital inflows.

Table 13.7. *Establishing the comovement in macroeconomic series*

	Latin America			Asia		
	1988.1 to 1992.7 Cumulative R^2	1988.1 to 1989.12 Cumulative R^2	1990.1 to 1992.7 Cumulative R^2	1987.1 to 1992.7 Cumulative R^2	1987.1 to 1988.12 Cumulative R^2	1989.1 to 1992.7 Cumulative R^2
Real exchange rate						
First principal component	0.44	0.41	0.68	0.43	0.72	0.50
Second principal com-						
ponent	0.75	0.78	0.83	0.71	0.88	0.75
Chi-squared	623.544	302.01	401.65	561.24	296.25	379.10
Probability value	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Reserves						
First principal component	0.66	0.48	0.71	0.67	0.63	0.76
Second principal com-						
ponent	0.79	0.69	0.87	0.88	0.83	0.87
Chi-squared	603.73	204.97	395.39	897.44	268.65	591.67
Probability value	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Domestic inflation rate 12-month percent change						
First principal component	0.38	0.60	0.45	0.62	0.60	0.39
Second principal com-						
ponent	0.67	0.88	0.64	0.78	0.77	0.67
Chi-squared	589.67	475.94	306.4	498.4	327.44	204.67
Probability value	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Notes: The cumulative R^2 gives the percentage of the variance of the original series explained by the first principal component, the first two principal components, and so on. Chi-squared is 45 for Latin America, 28 for Asia.

*Quantifying the role of external fa*ctors

In this section, the analysis proceeds in two stages: We first construct indexes

of the unobserved external factors (or impulses), which are then

incorporated in a structural vector autoregression. Second, we perform

tests of exclusion restrictions on the foreign factors to determine their statistical

significance. In modeling the external impulses, one could consider

a whole vector of variables that could have an impact on Latin American

economies. Here we opted for an unobserved index model, where the constructed

index is correlated with the observed time series on a set of U.S.

variables, which includes the nominal rates of return on real estate, stock

and bond markets, short-term deposit and lending rates of interest, and

detrended real disposable income. Specifically, we constructed and used

the first and second principal components of these series. The first principal

component captures the joint movement of the various interest rates

and economic activity in the United States. The second principal component

captures swings in returns on the equity and real estate markets. Having

now a measure of external impulses, we embedded them in a structural

vector autoregression. Defining *PCI,* and *PC2,* as the first and second

principal components of the U.S. variables and denoting the logs of reserves

and the real exchange rate by *RES,* and *REX"* respectively, the reduced

form of the system is given by:

$$PC1_t = \alpha_1 + \gamma_1 t + \sum_{i=1}^{n} \beta_{1i} PC1_{t-i} + \sum_{i=1}^{n} \beta'_{1i} PC2_{t-i} + u_t^{PC1}$$

$$PC2_t = \alpha_2 + \gamma_2 t + \sum_{i=1}^{n} \beta_{2i} PC1_{t-i} + \sum_{i=1}^{n} \beta'_{2i} PC2_{t-i} + u_t^{PC2}$$

$$RES_t = \alpha_3 + \gamma_3 t + \sum_{i=1}^{n} \beta_{3i} PC1_{t-i} + \sum_{i=1}^{n} \beta'_{3i} PC2_{t-i} + \sum_{i=1}^{n} \delta_{3i} RES_{t-i} \qquad (1)$$
$$+ \sum_{i=1}^{n} \delta'_{3i} REX_{t-i} + u_t^{RES}$$

$$REX_t = \alpha_4 + \gamma_4 t + \sum_{i=1}^{n} \beta_{4i} PC1_{t-i} + \sum_{i=1}^{n} \beta'_{4i} PC2_{t-i} + \sum_{i=1}^{n} \delta_{4i} RES_{t-i}$$
$$+ \sum_{i=1}^{n} \delta'_{4i} REX_{t-i} + u_t^{REX}$$

As equation (1) illustrates, we allow for dynamic interaction between
the foreign factors but impose their temporal exogeneity by not including
lagged values of the endogenous va~iables, reserves and the real exchange
rate, in their respective equations (i.e., $0u = O2; = o'u = 0' 2i = 0$); hence,
we impose structure on the temporal relationships between these variables.
40 Each equation in the system includes a constant and a time trend.
Since the tests could be affected by the number of lags included in the
right-hand side of each equation, and given that we had no strong priors
on this issue, we used the Akaike and Schwarz criteria to select among
one-, three-, six-, nine-, and twelve-month lag profiles.41 Both criteria, unless
otherwise noted, yielded three lags as optimal.

The reduced-form residuals, the *u/s* depend on the structural errors, *e''*
and the contemporaneous relationships between the endogenous variables,
specifically, $u, = etA$. So next, we consider the structure of the matrix
A, which describes the contemporaneous relationships between the variables.
Here we follow the methodology of Bernanke (1986) and Blanchard

Latin America

January 1988 - July 1992

Regional Index of Official Reserves

Regional Index of the Real Exchange Rate

2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2

Jan-88 Jul-88 Jan-89 Jul-89 Jan-90 Jul-90 Jan-91 Jul-91 Jan-92 Jul-92

Asia

January 1987 - July 1992

Regional Index of Official Reserves

Regional Index of the Real Exchange Rate

2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2

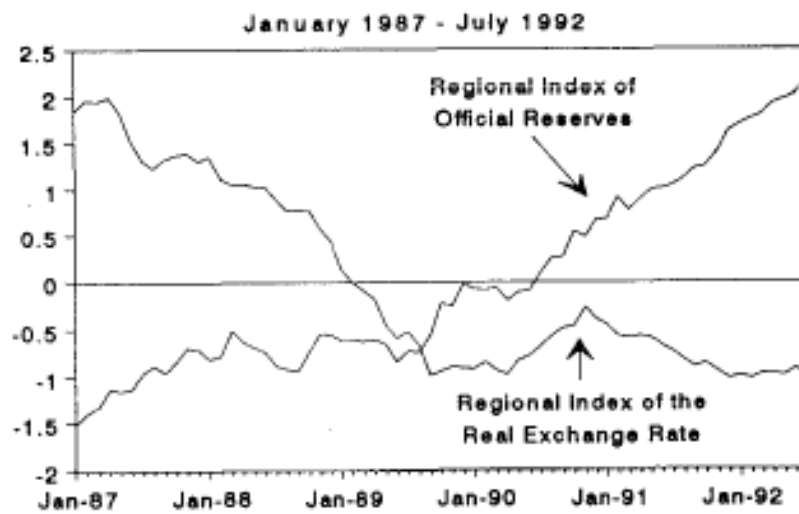Jan-87 Jan-88 Jan-89 Jan-90 Jan-91 Jan-92

Figure 13.7. First principal components. *Note:* An increase in the real exchange rate index denotes an appreciation. Principal components indexes are constructed to have zero mean and unit variance.

(1989), in that a priori (structural) restrictions are imposed on the identifying matrix.

Specifically, since there is a presumption that the foreign

factors are exogenous, we do not allow for feedback from shocks to the

domestic variables to the reduced form error of the first and second principal

components of the foreign variables. In addition, we impose the restriction

that the principal component indexes are orthogonal by construction,

so that they depend on their own shocks, as in equations (2) and (3)

$$PC1_t = e_t^{PC1}, \tag{2}$$

$$PC2_t = e_t^{PC2}, \tag{3}$$

while reserves are affected by the structural shocks to the foreign variables
and by its own shock,

$$RES_t = a_{31}PC1_t + a_{32}PC2_t + e_t^{RES}. \tag{4}$$

$$REX_t = a_{41}PC1_t + a_{42}PC2_t + a_{43}RES_t + e_t^{REX}. \tag{5}$$

The real exchange rate is allowed to respond to all of the shocks.[42]

After the system was estimated using monthly data from January 1988 to November 1991, we tested for the significance of the foreign factors. Table 13.8 summarizes the results of the tests for exclusion restrictions, tests that involve the temporal relationships. The null hypothesis being tested is that the foreign variables do not affect reserves and the real exchange rate. The high χ^2 statistics and low probability values indicate that in eight of the ten countries, one can reject the null hypothesis at the 75 percent level of confidence or higher.[43] Only in half of the sample countries is there any evidence of a significant contemporaneous relationship between the foreign factors and reserves and/or the real exchange rate. Calvo, Leiderman, and Reinhart (1993) examine in greater detail the relative importance of the foreign factors as well as the impulse response functions of reserves and the real exchange rate. By examining the variance decompositions of the real exchange rate and official reserves, those results indicate that for most countries a sizable fraction (about 50 percent) of the monthly forecast error variance in the real exchange rate and reserves is accounted for by foreign factors with foreign factors explaining the greatest share in countries that experienced no major changes in domestic policies in the period under consideration, 1988–91.

Table 13.8. *Tests for the significance of the foreign factors: 1988.1 to 1991.11*

| Country | Test for exclusion restrictions | Contemporaneous relationships | | | |
	Chi-squared statistic	ᵃ31	ᵃ32	ᵃ41	ᵃ42
Argentina	14.981	0.091	−0.451	−0.225	−0.14
	(0.242)	(0.243)	n.a.	(0.405)	n.a.
Bolivia	16.167	−0.092	−0.5331	−0.011	−0.041
	(0.184)	(0.170)	(0.045)	(0.030)	n.a.
Brazil	23.224	−0.045	0.481	0.043	0.323
	(0.026)	(0.011)	n.a.	(0.327)	n.a.
Chile	29.527	−0.031	−0.246	−0.018	0.545
	(0.003)	(0.041)	(0.026)	(0.152)	n.a.
Colombiaᵃ	31.548	−0.014	−0.048	0.009	0.024
	(0.002)	(0.157)	n.a.	(0.176)	n.a.
Ecuador	17.285	−0.230	0.668	−0.07	1.359
	(0.139)	(0.139)	(0.082)	(0.376)	n.a.
Mexico	23.203	−0.136	−0.324	−0.056	−0.063
	(0.026)	(0.216)	n.a.	n.a.	(0.627)
Peru	26.058	0.121	0.15	0.022	0.203
	(0.015)	(0.061)	(0.017)	(0.128)	n.a.
Uruguay	11.275	−0.042	0.197	−0.05	0.076
	(0.505)	(0.042)	(0.012)	(0.153)	n.a.
Venezuela	9.342	−0.045	−0.28	0.003	0.743
	(0.673)	(0.266)	n.a.	(0.054)	n.a.

ᵃAccording to the Akaike and Schwarz criteria the optimal lag length was six months.

5 Policy implications

The empirical analysis suggests that external factors have played a role in recent developments in Latin America. These capital flows, in turn, have contributed to the accumulation of reserves and appreciation of the real exchange rate.44 With these stylized facts as background, and taking into account the possibility that external factors may reverse their course in the future, the next key issue concerns the form and timing of the appropriate

policy response.

Given that the 1980s has been a period of capital shortage for Latin America, the first question in discussing policy responses is: What is the rationale for policy to interfere with present capital inflows? Several countries in the region are in the process of concluding successful negotiations with their creditors, and effectively coming to grips with their fiscal imbalances. Thus, why would capital inflows - which in countries like Chile and Mexico have financed larger private investment - be undesirable? There are at least three types of concerns that policy makers tend to voice about capital inflows: (l) Since capital inflows are typically associated with real exchange rate appreciation and with increased exchange rate volatility, it is feared these may adversely effect the export sector; (2) capital inflows - particularly when massive - may not be properly intermediated and, therefore, may lead to a misallocation of resources; (3) capital inflows - especially when of a "hot money" variety - could be reversed on short notice, possibly leading to a domestic financial crisis. These concerns are not new. Actually, it has been argued that the depth of the debt crisis in the 1980s had a lot to do with the magnitude and sudden reversal of international capital flows. Consequently, these concerns have often led the authorities to react to the capital inflows by implementing a broad variety of policy measures. The remainder of this section examines the relative merits of some of those policies.45 We consider five intervention policies: (1) a tax on capital imports; (2) trade policy; (3) fiscal tightening;

(4) central bank sterilized and nonsterilized intervention of capital inflows;

(5) a rise in marginal reserve requirements on bank deposits and more

regulated bank investments in equity and real-estate markets.

Taxes on short-term borrowing abroad were imposed in some countries –
 Israel in 1978 and Chile 1991. Although this policy is effective in

the short run, experience suggests that the private sector is quick in finding

ways to dodge those taxes through over- and underinvoicing of imports

and exports and increased reliance on parallel financial and foreign exchange

markets.

Trade policy measures can help to insulate the export sector from real

exchange rate appreciation. A possibility is higher export subsidies. However,

this policy distorts resource allocation between exportables and importables

and the fiscal cost could be substantial. For example, to offset a

20 percent overvaluation of the real exchange rate through export subsidies

would increase fiscal expenditures by about 4 percent of GDP, given

that the average export-GDP ratio for Latin America hovers around 20

percent. Alternatively, the authorities could increase both export subsidies

and import tariffs in the same proportion - so as to avoid creating further

relative discrepancies between internal to external terms of trade - and

announce that those subsidies and/or tariffs will be phased out in the future.

Indeed, if the private sector perceives these measures as transitory,

agents are likely to substitute future for present expenditure, contributing

to cool off the economy and to attenuate the real exchange rate appreciation.

The fiscal cost of this package need not be large, particularly if the

trade deficit is small. Furthermore, static distortions are not increased,

since such trade policy does not change initial relative price distortions

between exports and imports. However, this policy can be criticized on

two different grounds. First, its effectiveness depends on the private sector

believing that those subsidies and/or tariffs will be phased out in the future;

otherwise, there is no reason for individuals to lower present expenditure.

Thus, the effectiveness of the policy depends very strongly on credibility

- both the credibility of policy, and the credibility of price forecasts.

Second, this policy - as the previous one involving only subsidies - deviates

from the general worldwide trend toward commercial opening and

free-trade agreements.

Another policy reaction to greater capital inflows could be to tighten

fiscal policy - policy (3) - through higher taxes or lower government expenditure.

While this policy is not likely to stop the capital inflow, it may

lower aggregate demand and curb the inflationary impact of capital inf1ows.

46 In that context, higher taxes may be less effective than lower government

expenditure. Often when credit is widely available - as is the case

when the country is subject to massive capital inflows - individuals' expenditures

can be largely independent of their tax liability. This is espe-

cially true if higher taxes are expected to be transitory- a somewhat plausible

expectation since higher taxes would be associated with transitory

capital inflows. In contrast, lower government expenditure - particularly

when this expenditure is directed to the purchase of nontraded goods and services - has a direct impact on aggregate demand, which is unlikely to be offset by an expansion of private sector demand. However, contraction of government expenditure is always a sensitive political issue. Overall, it is hard to provide a strong case for adjusting fiscal policy - which is usually set on the basis of medium- or long-term considerations - in response to short-term fluctuations in international capital flows. However, if the authorities had envisioned a tightening of the fiscal stance, the presence of capital inflow may call for earlier action in this respect.

Sterilized intervention has been the most popular policy response to the present episode of capital inflows in Latin America. Leading examples of this policy are provided by Chile in 1990-91 and Colombia in 1991. Under capital inflows, this type of intervention amounts to a central bank sale of government bonds in exchange for foreign currencies and securities. 47 This policy does not necessarily stop private agents from engaging in international loan transactions. However, if successful, it insulates the stock of domestic money from variations associated with capital mobility. If effective, sterilization will tend to increase domestic nominal and real interest rates, lower aggregate demand, and mitigate the appreciation in the real exchange rate.48 There are, however, two main difficulties with sterilized intervention. First, sterilization leads to an increase in the differential between the interest rate on domestic government debt and international reserves, thus creating a !1sca!(or quasi-fiscal) deficit. Second,

by preventing a fall in the domestic-foreign interest rate differential,

sterilization tends to perpetuate the capital inflow thus exacerbating any

problems caused by this inflow. The impact of sterilization on the interest

differential can be seen in Figure 13.4, by comparing sterilizing cases, such

as Chile and Colombia, against the nonsterilizing case of Argentina. It is

seen that in the current capital-inflows episode, the domestic interest rate

exhibits a much smaller decline (or an actual increase) in sterilizing than

in nonsterilizing countries. The evidence from the recent experience of

Chile and Colombia indicates that sterilized intervention has not reduced

capital inflows. Yet, the increase in the fiscal deficit may be quite substantial;

for example, Rodriguez (1991) estimates the fiscal burden of sterilized

intervention in Colombia during 199I at about 0.5 percent of GDP. Consequently,

serious doubts can be cast on the desirability of sterilized intervention

in the cases where countries are still attempting to reduce domestic

debt, and their public sector budgets require further trimming.49

Alternatively, the central bank could opt for nonsterilized intervention,

whereby the central bank purchases the foreign exchange brought in by

the capital inflow in exchange for domestic money - as, for example, under

a fixed exchange rate. This policy can help avoid nominal exchange

rate appreciation, and is likely to narrow the domestic-foreign interest rate

differential; however, it is likely to generate an increase in the domestic

monetary base beyond the central bank's target. The latter, in turn, could

fuel inflationary pressures and contribute to the real exchange rate appreciation.

It is at this point that credibility considerations about maintaining

a fixed nominal exchange rate come into play. In this connection,

floating exchange rates have an edge, because the required real exchange

rate appreciation does not necessarily call for inflation to accelerate. Furthermore,

floating rates allow the domestic central bank to operate as a

"lender oflast resort." In contrast, under fixed rates and fractional-reserve

banking, preventing liquidity-type financial crises - particularly, when

capital starts flowing out - may call for the central bank to hold a large

stock of international reserves, a costly jf not unfeasible undertaking.50

Therefore, these credibility-related considerations give some support to a

regime of floating exchange rates when the economy is subject to substantial

capital flows. 51

As discussed earlier, attempting to insulate the banking system from

short-term capital flows is an attractive goal in cases where most of the

inflows take the form of increased short-term bank deposits. In these circumstances,

a sudden reversal of capital inflows may quickly result in bank

failures. Under policy (5), marginal reserve requirements could be sharply

raised such that they become higher as the maturity of deposits shortens;

in fact, a 100 percent required-reserve ratio could be imposed on deposits

with the shortest maturity. Although this scheme would impose a burden

on the banking system, and could result in some disintermediation of the

capital inflows, it has the advantage of decreasing banks' exposure to the

risks of capital flow reversals. In addition, regulation that limits the exposure

of banks to the volatility in equity and real-estate markets would

further insulate the banking system from the bubbles associated with sizable

capital inflows.

To summarize, there are grounds to support a policy intervention mix

based on the imposition of a tax on short-term capital imports, on enhancing

the flexibility of exchange rates, and on raising marginal reserve requirements

on short-term bank deposits. Given the likely fiscal costs it is

hard to make a strong case in favor of sterilized intervention, unless countries

exhibit a strong fiscal stance, and capital inflows are expected to be

short-lived. In any case, we believe that none of these policies will drastically

change the behavior of real exchange rates or interest rates for an

extended period of time. The choice of appropriate policies, however,

could decidedly attenuate the detrimental effects of sudden and substan"

tial future capital outflows.

References

Bernanke, B. S. (1986). "Alternative Explanations of the Money-Income Correlation." *Carnegie-Rochester Conference Series on Public Policy* 2 (autumn): 49-100.

Blanchard, O. 1. (1989). "A Traditional Interpretation of Macroeconomic Fluctuations." *American Economic Review* 79: 1146-64.

Calvo, G. A. (1983). "Trying to Stabilize: Some Theoretical Reflections Based on the Case of Argentina." In P. Aspe Armella, R. Dornbusch, and M. Obstfeld (eds.), *Financial Policies and the World Capital Market: The Problem of Latin American Countries.* Chicago: University of Chicago Press for NBER, 199-220.

Calvo, G. A. (1989). "Incredible Reforms." In G. A. Calvo et al. (eds.), *Debt, Stabilization and Development.* Cambridge, Mass.: Basil Blackwell.

Calvo, G. A. (1991). "The Perils of Sterilization." *IMF Staff Papers* 38 (March): 921-26.

Calvo, G. A., and C. A. Vegh. (1992). "Currency Substitution in Developing Countries: An Introduction." *Revista de Analisis Economico* 7: 3-27.

Calvo, G., L. Leiderman, and C. Reinhart. (1993). "Capital Inflows to Latin America: The Role of External Factors." *IMF Staff Papers* 40: 108-51.

Calvo, G., L. Leiderman, and C. Reinhart . "Capital Inflows to Latin America: The 1970's and the 1990's:' IMF Working Paper no. 85. Forthcoming in E. Bacha (ed.), *Development, Trade, and the Environment.* London: Macmillan.

Collyns, c., 1.Clark, R. Feldman, A. Mansur, P. Mylonas, K. Parker, R. Renhack, p. Szymczak, and L. Pauly. (1992). *Private Market Financing for Developing Countries.* World Economic and Financial Survey Series. Washington, D.C.: International Monetary Fund, December.

Cumby, R. E., and M. Obstfeld. (1983). "Capital Mobility and the Scope for Sterilization: Mexico in the 1970s." In P. Aspe Armella, R. Dornbusch, and M. Obstfeld (eds.), *Financial Policies and the World Capital Market: The Problem of Latin American Countries.* Chicago: University of Chicago Press for NBER,245-76.

Dhrymes, P. 1. (1970). *Econometrics: Statistical Foundations and Applications.* New York: Springer-Verlag, 42-83.

Diaz-Alejandro, C. F. (1983). "Stories of the 1930s for the 1980s."In P.Aspe Armella, R. Dornbusch, and M. Obstfeld (eds.), *Financial Policies and the World Capita! Market: The Problem of Latin American Countries.* Chicago: University of Chicago Press for NBER, 5-35.

(1984). "Latin American Debt: I Don't Think We Are in Kansas Anymore." *Brookings Papers on Economic Activity* 2: 335-89.

Edwards, S. (1989). *Real Exchange Rates, Devaluation, and Adjustment: Exchange Rate Policy in Developing Countries.* Cambridge, Mass.: MIT Press, 87-160.

EI-Erian, M. A. (1992). "Restoration of Access to Voluntary Capital Market Financing." *IMF Staff Papers* 39: 175-94.

Engle, R., and 1. Issler. (1992). "Common Trends and Common Cycles in Latin America:' Mimeograph copy.

International Monetary Fund. (1991). "Determinants and Systemic Consequences of International Capital Flows." IMF Occasional Paper no. 77, March. Washington, D.C.: International Monetary Fund.

Information Notice System (Database). Washington, D.C.

International Financial Statistics. Washington, D.c. Various issues.

World Economic Outlook. A survey by the Staff of the International Monetary Fund. Washington, D.C. Various issues.

Kuczynski, P. P. (1992). "International Capital Flows into Latin America: What Is the Promise?" Presented at the World Bank Annual Conference on Development Economics, Washington, D.C., April 30.

LDC Debt Report. New York: American Banker. Various issues.

Lutkepohl, H. (1985). "Comparison of Criteria for Estimating the Order of a Vector Autoregressive Process." *Journal of Time Series Analysis* 6: 35-52.

Mathieson, D. 1., ~nd L. Rojas-Suarez. (1993). "Liberalization of the Capital Account: Expenences and Issues." IMF Occasional Paper no. 103, March. Washington, D.C.: International Monetary Fund.

Mussa, M. (1981). *The Role of Official Intervention.* Occasional Paper no. 6. New York: Group of 30. Reprinted in L. Melamed (ed.), *The Merits of Flexible Exchange Rates: An Anthology.* Fairfax, Va.: George Mason University Press, 1988, 78-93.

Obstfeld, M. (1991). "The Effectiveness of Foreign-Exchange Intervention: Recent Experience 1985-1988." Working Paper, Harvard University.

Pfeffermann, Guy, and Andrea Madarassy. (1993). "Trends in Private Investment in Devel~ping Countries 1993: Statistics for 1970-91:' Discussion Paper no.

16. Washmgton, D.C.: International Finance Corporation.

Reisen, H. (1993). "The Impossible Trinity in South-East Asia." *International Economic Insights.* Washington, D.C.: Institute for International Economics.

Rodri.guez, C. (1991). "Situacion Monetaria y Cambiaria en Colombia." UnpublIshed manuscnpt. Buenos Aires: CEMA, November.

Salomon Brothers. (1992). *Private Capital Flows to Latin America.* New York: Sovereign Assessment Group, February.

Stiglitz, 1. E. (1990). "Symposium on Bubbles." *Journal of Economic Perspectives* 4: 13-18.

Stock, 1. H., and M. W. Watson. (1989). "New Indexes of Coincident and Leading Economic Indicators." *NBER Macroeconomics Annual* 1989. Cambridge, Mass.: MIT Press, 351-93.

Swoboda, A. K. (1983). "Exchange Rate Regimes and European-u.S. Policy Interdependence."*IMF Staff Papers* 30 (March): 75-102.

United States Bureau of Economic Analysis. *Survey of Current Business.* Washington, D.C.: Various issues.

Watson, M. w., and R. F. Engle. (1983). "Alternative Algorithms for the Estimation of Dynamic Factor, Mimic and Varying Coefficient Regression Models." *Journal of Econometrics* 23: 385-400.

Zahler, M. R. (1992). "Politica Monetaria en un Contexto de Apertura de Cuenta de Capitales." *Boletin Mensual* (Banco Central de Chile) 77 I (May): 1169--80.

Endnotes

1 Latin America is not the only region that has experienced increased capital inflows in 1991. In fact, similar developments have occurred in Asia and the Middle East. At the same time, there had been a marked rise in capital outflows from the United States and Japan.

2 See, e.g., Diaz-Alejandro (1983) and (1984).

3. For a recent study of the effects of capital movements, see International Monetary Fund (1991). On the role of reforms and capital account liberalization, see Mathieson and Rojas-Suarez (1993).

4 For a comparison of the current episode to the late 1970s, see Calvo, Leiderman, and Reinhart (1992).

5 For tracing on the evolution over time of individual country ratings, see e.g., *LDC Debt Report.*

6 The countries included in our sample are Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, and Venezuela.

7 The countries that make up the Asian sample are Indonesia, Korea, Malaysia, Philippines, Singapore, Sri Lanka, Taiwan, and Thailand.

8 Notice that $RA < 0$ implies accumulation of reserves by the monetary authority.

9 See also "Latin American Finance and Investment" *Financial Times*' April 6, 1992, Kuczynski (1992), and Salomon Brothers (Latin America includes the same set of countries).

10 IMF' s *World Economic Outlook* and *International Financial Statistics.*

11 These figuresG, DwPhich adrerelayvaoinlabplreehfmrol~llarty enaaUIt'Oonral'income accounts data [or 1.991. . 1
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12 See Mathieson and Rojas-Suarez (1993).

13 Some of this increased borrowing may represent hidden repatriation of flight capital.

14. See, e.g., El-Erian (1992) and Collyns et al. (1992).

15. For a comprehensive discussion of the composition of the inflows in the current episode and how it compares with the inflows of the late I970s, see Collyns et al. (1992).

16 Brazil and Uruguay are exceptions to this pattern, as in both countries capital inflows were not accompanied by an increase in reserves.

17 The IMF indexes of the real effective exchange rate are used, hence an appreciation is represented by an increase in the index.

18 The surge in stock prices during 1991 has been followed by more moderate declines in 1992.

19 The price--earnings ratio in Argentina increased from 3.1 in 1990.4 to 38.9 in 1991.4; in Chile it increased from 8.9 in 1990.4 to 17.4 in 1991.4; and in Mexico it moved from 13.2 in 1990.4 to 14.6 in 1991.4. These figures are from Emerging Markets Data Base, International Finance Corporation.

20 See Salomon Brothers (1992).

21 An implication of this discussion is that from the investor's perspective, the information content of a drop in U.S. interest rates is different from that of an equal rise in the domestic interest rate-while in both these cases the interest rate differential would change by the same amount.

22 For instance, the International Finance Corporation (IFC) Asia composite, which includes Korea, Malaysia, Taiwan, and Thailand, registered total returns (in dollars) of 83 percent and 57 percent in 1988 and 1989, respectively.

23 As Figure 13.3 illustrates, most of the Latin American stock markets have recently given up some of the earlier gains. Similarly, the Asian markets weakened during 1990 and 1991 after the earlier surge.

24 This, of course, does not explain Chile and Korea, where there has been a real exchange rate appreciation alongside a sharp rise in investment.

25 For each of those two countries the decline amounted to 3.5 percent of GDP.

26 This does not suggest that fiscal adjustment has not taken place in a number of Latin American countries, but rather that its timing did not coincide with the capital inflows.

27 See Edwards (1989) for a comprehensive discussion of how these and other economic "fundamentals" affect the real exchange rate.

28 Beyond short-term interest rates, returns from other investments in the United States have decreased recently as well-e.g., in the real-estate market.

29 Some examples of this development are as follows: (I) There has been an increase in the amount of investments in foreign securities by mutual funds in the United States. As of May 1992, the assets of stock funds that invest largely outside the United States stood

at $41.8 billion, more than twice the level at the end of 1988, and assets of global funds have soared to $28.5 billion from just $3 billion in 1988. (2) In 1991, the sale of foreign shares in public and private deals doubled, to a record $9.78 billion. Bond deals rose 48 percent to $55.33 billion. (3) New foreign investment in U.S.companies and real estate plummeted 66 percent in 1991. See the *New York Times,* July 5, 1992.

30 As indicated earlier, private capital outflows from Japan also increased sharply, by $36 billion, in 1991.

31 It is useful to recall how sizable these inflows to the United States were in the mid-1980s (Table 13.4). From net capital outflows of about $20 billion a year in the late 1970s, the private capital account turned around into surpluses (capital inflow), which peaked at $128 billion in 1985. This inflow, which mainly took the form of increased borrowing from abroad, was mostly used to finance high and increasing current account deficits that were well above $100 billion in the second half of the 1980s.

32 See El-Erian (1992) for a comprehensive discussion.

33. For an exposition of principal components analysis, see, e.g., Dhrymes (1970). Swoboda (1983), in an application that is close in spirit to ours, used this approach to examine economic interdependence across different exchange rate regimes for six of the G-7 countries.

34 All the analysis that follows uses the logs of reserves and of the real exchange rate.

35 If the ten series were identical (perfectly collinear), the first principal component would explain 100 percent of the variation of the original series. Alternatively, if all ten series were perfectly uncorrelated, it would take ten principal components to explain all of the variance in the original series; no advantage would be gained by looking at common factors, since none exist.

36 The test statistics, which are distributed as a x'' with 45 degrees of freedom, and the attendant probability values are presented at the bottom of Table 13.6.

37 Applying a different methodology Engle and Issler (1992) find significant comovement in the per capita GDP of several Latin American countries, as these countries share common trends and Common cycles.

J8 Notice that, as shown in Figure 13.3, Brazil's real exchange rate depreciated through most of the sample period and its upturn came fairly late in the sample. Thus, it is not surprising to find that the regional exchange rate index, the first principal component, does poorly in capturing its fluctuations. In effect, their correlation is negative. These details are available upon request.
39 Calvo, Leiderman, and Reinhart (1993) explore the possible *role* of external factors by examining the simple pairwise correlation coefficients between the principal components indexes for reserves and the real exchange rate and a set of variables from the United

States. It is hypothesized that a fall in U.S. interest- rates, stock market returns, real-estate returns, and economic activity would be associated with an increase in the capital inflow to Latin America which would be at least partly reflected in an increase in the regional indexes for reserves and the real exchange rate (the latter indicating a real exchange rate appreciation). As shown there, most of the evidence is indeed in this direction.

40 Our procedure is similar to the DYMIMIC models associated with Watson and Engle (1983), and Stock and Watson (1989). One key difference in the approaches is that here we adopt a two-step procedure by first constructing the unobserved factor index (indexes) and then incorporating that factor(s) in a dynamic model.

41 For simulation evidence on the efficacy of these criteria, see Lutkepohl (1985):

4' Alternative orderings are explored. One alternative imposes that there be no contemporaneous relationship between reserves and the real exchange rate, while another treats reserves as the most "endogenous" variable in the system. The results do not differ appreeiciably from those presented here.

43 Evidence suggesting the importance of U.S. economic developments on the Latin American business cycle is presented in Engle and Issler (1992).

44 In terms of economic agents in Latin America, it is also possible to interpret these developments as originating in a portfolio shift away from foreign (dollar-denominated) and toward domestic financial and physical assets. For a model in which such a portfolio shift leads to a temporary appreciation of the real exchange rate and to accumulation of reserves by the central bank, see Calvo (I983).

45 For a discussion of these issues from the perspective of Chilean monetary and exchange rate policies, see Zahler (1992).

46 In addition, to the extent that it reduces the government's need to issue debt, a tighter fiscal stance is also likely to lower domestic interest rates.

47 For a more detailed discussion of the role of central bank (sterilized and nonsterilized) intervention, see Mussa (1981) and Obstfcld (1991).

48 A necessary condition for these outcomes, and for the ctfectj'veness of sterilized intervention, is that domestic and foreign bonds are imperfect substitutes in agents' portfolios, Casual observation suggests that this seems to be the case in Latin America. Cumby and Obstfeld (1983) produced econometric results for Mexico in the 1970s in support of imperfect substitutability between peso-denominated assets and foreign assets. For industrial countries, Obstfeld (1991) concludes that sterilized intervention is a weak instrument of exchange rate policy, and that monetary and fiscal policies, and not intervention per se, have been the main policy determinants of exchange rates in recent years.

49 See also Calvo (1991), which provides an example in which social welfare always declines with sterilization, and in which the effectiveness of sterilization relies on its worsening the credibility of an undergoing stabilization program.

50 The problem is exacerbated when, as in most Latin American countries, the liabilities of the banking system are heavily biased toward short-term deposits, enhancing the chances of a run against the domestic banking system.

51 When the system is not subject to big swings of international capital, the opposite conclusion can be reached: Fixed rates may dominate. See Calvo and Vegh (1992).