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Research for Action

Research for Action 28

Dealing with Capital Inflows

Are There Any Lessons?

Carmen M. Reinhart and Steven Dunaway

UNU World Institute for
Development Economics Research
(UNU/WIDER)

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UNU World Institute for Development Economics Research (UNU/WIDER)
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FOREWORD

I am pleased to present Carmen Reinhart and Steven Dunaway's paper, 'Dealing with Capital Inflows: Are There Any Lessons?', which reviews the experience of a heterogeneous group of developing countries in maintaining macroeconomic stability in the face of heavy capital inflows. The paper makes a comparison of country responses organized according to policy response. It identifies the limitations of each of these policies and identifies conditions under which some policies, such as sterilization, can be self-defeating in that they attract more short-term investment. Even attempts to liberalize capital outflows further to offset the monetary impact of capital inflows can backfire if international investors interpret the move as reducing their country risk.

This paper comes out of the 1996-1997 WIDER research project entitled 'Short-term Capital Movements and Balance of Payments Crises'. The research in this project will evaluate the variety of policy responses and institutional features at the country and the international level with the intention of identifying policy pitfalls and reform recommendations in dealing with cross-border capital flows. It will also attempt to identify the mix of policies and regulatory approaches (1) for encouraging the private sector to use (and generate) better information in making their international investment decisions and (2) for ensuring that country stances properly reflect the lender-of-last-resort burdens that all monetary authorities have in maintaining functioning credit markets in advanced and emerging economies.

Carmen Reinhart, who is with the University of Maryland is a participant in the project, co-authoring a chapter with Peter Montiel. Steven Dunaway is with the International Monetary Fund.

Professor Giovanni Andrea Cornia
Director, UNU/WIDER
September 1996

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Carmen M. Reinhart and Steven Dunaway
August 1996

ABSTRACT

We have now witnessed more than half a decade of relatively heavy capital inflows to a large group of highly heterogeneous developing countries and economies in transition in Asia, Eastern Europe, the Former Soviet Union, Latin America, and parts of Africa and the Middle East--in effect, we have already seen the reversal of these flows in a number of cases. In light of the richness of the country experiences and the continued relevance of the topic in a world of increasingly integrated capital markets, our aim in this paper is threefold: first, to chronicle the policies adopted in a broad range of countries, so as to document who did what and when; second, to try to assess to what extent such policies achieved their intended objectives and; lastly following from the previous two points, to draw lessons about which policies appeared to have been the most successful tools in coping with surging capital inflows, with emphasis on the 'policy mix' and how individual measures interact.

In this retrospective review of the policy response to the surge in capital inflows we find crucial importance of the interaction of policies to either magnify or reduce the volume of inflows, affect their composition, and/or alter their macroeconomic consequences. For example, a combination of little or no short-term exchange rate uncertainty (as is the case when there is an implicit or explicit peg), sterilized intervention, which tends to prevent domestic short-term interest rates from converging toward international levels, and no binding impediments to capital inflows (through either taxation or quantitative constraints) is likely to maximize the volume of short-term capital inflows a country receives (this policy mix characterizes the Mexican experience during 1990-93 reasonably well). The pairing of little or no short-term exchange rate risk and relatively high domestic interest rates favors the short-term investor; for the long-term investor, there is always exchange rate risk since over longer horizons the probability of a realignment of the peg or a change in the exchange rate regime increases. Further, longer-term investments (such as foreign direct investment) tend to be less interest sensitive. Hence, it would not be surprising to see that if such a policy mix remains in place for any extended period of time it may end up skewing the composition of inflows toward the short end of the maturity spectrum.

Similarly, it could be argued that the mix of sterilized intervention and controls on inflows may undermine the 'individual effectiveness' of these policies. The comparatively high interest rate differentials that usually accompany sterilization may act as an inducement to circumvent the capital controls (i.e. firms and banks may find ways of borrowing offshore). To the extent that they are successful in dodging the controls, this tends to offset some of the contractionary effects of the sterilization efforts (this is case of Brazil in 1994-95). Along the same lines, liberalizing controls on outflows as a policy aimed at reducing net capital inflows may backfire if domestic interest rates are high relative to international levels and/or if it is interpreted a positive signal of the future economic/policy environment. Indeed, several countries (Chile, Malaysia, and Thailand) liberalized outflows while at the same time engaging in substantive sterilization efforts.

I INTRODUCTION

A capital inflow represents an increase in the demand for a country's assets--hence, in the absence of policy intervention, the tendency is for the currency to appreciate. Yet, most of the developing countries that received sizable capital inflows during the first half of 1990s have, in varying degrees, actively resisted a nominal exchange rate appreciation. This reluctance to allow market forces to take their course stemmed from a variety of reasons: the authorities' explicit commitment (or the less explicit desire) to maintain a fixed exchange rate; a general perception that the inflows are a temporary phenomenon; an attempt to prevent or delay a real exchange rate appreciation (so as to maintain international competitiveness); or a combination of these motives. Besides worrying about a potential 'overvaluation,' another prominent concern among policy circles that has provided the grounds for policy intervention has been that an important share of these cross-border financial flows has been short-term and, often, volatile. These 'hot money' features could add to the vulnerability of the financial sector, particularly if the banking system is playing a dominant role in intermediating these flows. In the worst scenario, such volatility could ignite a Mexican-style crisis.

These multiple concerns have led policymakers in countries experiencing a surge in capital inflows to react by actively implementing a spectrum of policies (see Calvo, Leiderman, and Reinhart, 1993 and 1994; Schadler et. al, 1993; and Montiel, 1995):

Fiscal austerity measures, particularly on the spending side, have been implemented to alleviate some of the pressures on the real exchange rate and to cool down an overheating economy. The effectiveness of fiscal measures in easing the pressure on the real exchange rate could be magnified if fiscal expenditure falls heavily on nontraded goods. Furthermore, fiscal surpluses deposited at the central bank can help 'sterilize' the expansive monetary effects of foreign exchange purchases.

Trade liberalization has been accelerated in some cases; the idea being that productivity gains in the nontraded sector could also dampen pressures on the real exchange rate. Furthermore, reducing the distortions associated with controls on trade may temporarily widen the current account deficit--effectively absorbing some of the inflows without boosting domestic demand.

Liberalization of capital outflows has also been a popular response to rising capital inflows. By permitting domestic residents to hold foreign assets, the conventional wisdom holds, gross outflows would increase reducing net inflows (see Labán and Larraín, 1994).

Various forms of *controls on capital inflows*, whether in the form of taxes, quantitative restrictions, or in the guise of 'prudential measures' usually imposed on the financial sector have also been implemented; most of these measures were aimed at deterring

short-term inflows. In addition, (as argued by Budnevich and Cifuentes, 1993) by introducing these capital controls some measure of short-run monetary independence is gained even in relatively rigid exchange rate regimes.

Revaluation of the nominal exchange rate has also been resorted to, particularly as it became evident that the inflows were persistent and curtailing the monetary expansion associated with the accumulation of foreign exchange reserves became increasingly difficult and costly. Furthermore, if a real exchange rate appreciation is to take place, it is preferable that the adjustment comes via the exchange rate rather than through higher domestic inflation.

Greater exchange rate flexibility has also been a part of the menu of policy responses to the rising capital inflows. As in the case of a revaluation, it allows the adjustment to take place through the nominal exchange rate rather than through prices. However, unlike discrete revaluations in the context of an exchange rate peg or a crawl, greater flexibility increases the independence of the domestic monetary authorities and it introduces and/or increases short-run exchange rate risk. The presence of (or increase in) such risk, it is argued, would act as a deterrent to short-term speculative inflows.

Less conventional measures that have aimed to *curb consumer credit and consumption activity* have also been part of the package of 'countercyclical' policies in a number of countries. In most cases, these policies targeted consumption of durable goods.

However, the policy most often resorted to, across countries and across time, in response to the surge in capital inflows in recent years has been *sterilized intervention.*[1] To avoid some (or all) of the nominal exchange rate appreciation that would have resulted from the capital inflow, the monetary authorities have intervened in varying degrees of intensity in the foreign exchange market. The result of that intervention was an accumulation of foreign exchange reserves. To offset some or all of the monetary expansion associated with the purchase of foreign exchange, central banks have most often opted to sell treasury bills or (central bank paper)--but in many cases these open market operations were complemented by increases in reserve requirements (see Reinhart and Reinhart, 1995) and shifts government deposits (or other such funds) from the banking system to the central bank.

We have now witnessed more than half a decade of relatively heavy capital inflows to a large group of highly heterogeneous developing countries and economies in transition in Asia, Eastern Europe, the Former Soviet Union, Latin America, and parts of Africa and the Middle East--in effect, we have already seen the reversal of these flows in a number of cases. In light of the richness of the country experiences and the continued relevance of the topic in a world of increasingly integrated capital markets, our aim in this paper is threefold: first, to chronicle the policies adopted in a broad range of countries, so as to document who did what and when; second, to try to assess to what extent such policies achieved their intended objectives and; lastly following from the previous two points, to

[1] Argentina is the only country in the recent inflow episode that did not attempt to sterilize any part of its foreign exchange market intervention.

draw lessons about which policies appeared to have been the most successful tools in coping with surging capital inflows, with emphasis on the 'policy mix' and how individual measures interact.

Since sterilized intervention is the most universal policy response, the next section reviews the extensive country experiences on the use of this policy and the varied forms it has taken; its impact on interest rates, spreads, and the level and composition of capital flows is discussed. Exchange rate policy is considered next. The discussion in Section III focuses on two policies: a realignment of the exchange rate while maintaining the prevailing exchange rate regime and a change in the exchange rate regime altogether. The fiscal policy response to rising capital flows, as well as the implications it has for the conduct of monetary policy, are covered in the next Section while Section V focusses on policies that affect the capital account, such as the liberalization of capital outflows and policies to discourage inflows. Issues related to the interaction and sequencing of these policies and the key lessons are addressed in the final section.

II MONETARY POLICY: STERILIZED INTERVENTION

The aims of sterilized intervention are twofold. In intervening in the foreign exchange market a nominal exchange rate appreciation is avoided or dampened. Meanwhile, the open market sale of bonds that accompanies the foreign exchange transaction avoids the monetary expansion that would otherwise ensue from the central bank's accumulation of foreign exchange reserves. Sterilized intervention may also influence the exchange rate by 'signaling' policy intentions (see, for instance, Mussa, 1981). However, despite the fact that sterilization efforts have been so numerous and often quite prolonged, relatively little has been said about the impact these policies have had on domestic interest rates (either their level or their variability), monetary growth, and the volume and composition of capital flows.

Some recent studies have examined empirically whether there is *scope* for sterilization policies at all, since under perfect capital mobility and when assets are perfect substitutes sterilization is altogether ineffective (unless the signalling channel is significant).[2] Some studies have concluded that in most of the developing countries examined there is some scope for sterilization policies in the short-run (i.e. changes in domestic credit are not instantaneously offset by changes in net foreign assets).[3] Other studies have found stronger evidence of high capital mobility in a number of the developing countries that have experienced heavy capital inflows, thus casting greater doubts on their ability to sterilize at all (see Frankel, 1994a). In either case, the net conclusion is that there appears to be little room for sterilization policies on a sustained basis.

Frankel (1994b) focused on the *effects* of sterilization policies and analyzes under which conditions sterilization of capital inflows could result in a rise in domestic interest rates and in which instances sterilization simply prevents domestic interest rates from converging to international levels. For instance, domestic interest rates would rise if the domestic currency assets investors want to hold (i.e. bank CDs, stocks, bonds) are poor substitutes for short-term central bank paper or treasury bills being supplied by the central bank. To induce investors to hold the increased supply of short-term paper, the price of this paper has to decline and yields increase. Another reason why interest rates could rise is if there is an increase in the demand for money due to, say, a successful reduction in inflation and/or a higher level of income. By sterilizing, the monetary authorities are not accommodating the increased demand for money and, hence, forcing the money market to clear at a higher interest rate. Calvo (1991) stresses the potential quasi-fiscal losses associated with sterilization, as the central bank acquires relatively

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[2] Indeed, the empirical evidence of the effectivess of sterilized intervention in industrial countries is mixed with some studies (Obstfeld, 1990) arguing intervention has not played an important role in currency realignments in recent years and others (Dominguez and Frankel, 1993, for instance) concluding that it does. See Taylor (1993) for a review of this literature.

[3] See Schadler et. al (1993).

low-yield foreign exchange reserves and issues high-yield sterilization bonds. Focusing on the experience of Colombia in 1991, a recent study cautioned that large-scale sterilization policies could backfire by leading to higher domestic short-term interest rates, wider differentials vís-a-vís international interest rates, and promoting further inflows of short-term capital (see Calvo, Leiderman, and Reinhart, 1993). It is, of course, risky to make generalizations about the effects of sterilization from a single episode. Hence, to better understand the effects of sterilization policies and gauge their success in achieving their goals, it is useful to systematically review the country experiences.

The remainder of this section fills that gap by analyzing the recent experience of several countries where sterilized intervention was a central policy response to the surge in capital inflows. The focus is on episodes where the timing of the policy changes is relatively well-defined. However, since sterilization policies, broadly defined, have taken a variety of forms it is necessary to have a preliminary description of the various forms sterilization has taken in the selected group of countries.[4] Specifically, we consider three types of sterilization policies: open market operations, reserve requirement changes, and the management of government deposits. The relative merits and when and where these measures were employed will be discussed in turn.

1. Open market operations

Sterilization through open market operations has usually meant that the central bank sells either government securities, such as treasury bills, or its own paper. Mexico, for instance, carried out its sterilization policies through central bank sales of government debt, such as CETES and TESOBONOS. However, in many countries, including Chile, Colombia, Indonesia, Korea, and the Philippines, the central bank issued its own debt for the purposes of conducting open market operations. In some instances, (Malaysia and Sri Lanka), open market operations were initially conducted by selling public sector debt, but as the central bank depleted its own holdings of government debt, either because of the large scale of the sterilization effort and/or because new issuance dwindled as public finances were consolidated, the central bank also began to auction its own debt as well (Table 1).

It has been argued that the main advantage of sterilization through open market operations is that they offer a viable way of curtailing the monetary/credit expansion without imposing a heavier tax burden on the banking system and inducing financial disintermediation, as is the case with increased reserve requirements (see Calvo, Leiderman, and Reinhart, 1994). The main disadvantages are that it may entail sizable central bank costs even in a relatively short period of time.[5] Further, such sterilization

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[4] See Folkerts-Landau et. al (1994)).

[5] Rodriguez (1992), suggests that the central bank losses associated with Colombia's sterilization efforts during 1991 amounted to 0.5-0.7 percent of GDP. Kiguel and Leiderman (1993) indicate that during 1990 to mid-1992 Chile's central bank losses due to sterilization policies were about 1.4 percent of GDP. Gurria (1993) estimates that the quasi-fiscal losses for Mexico were in the 0.2-0.4 percent per annum range during 1990-92. Central bank losses in Indonesia, Malaysia, and Sri Lanka have also been nontrivial.

efforts may increase the domestic/international interest rate spread sufficiently so as to end up attracting more short-term capital. However, despite these drawbacks sterilization policies may be a viable policy response, particularly if there are concerns that the banking system is not capable of adequately intermediating capital inflows and/or the inflows are perceived to be temporary.

The intensity of these policies has varied considerably across countries and across time (see Table 1). Chile during the first half of 1990, Colombia in most of 1991, the Czech Republic during the latter half of 1994 and early 1995, Indonesia during 1991-92, Malaysia from mid-1991 through early 1993, and Sri Lanka 1991-92, all represent episodes of attempts to conduct open market operations on a scale so as to almost *fully* sterilize the capital inflows.[6] Chile mid-1991 to the present, Korea, Mexico, the Philippines, and Thailand are cases where sterilization has been used throughout much of the inflow episode to sterilize *a portion* the inflows. For example, during 1993, the year when capital inflows peaked, Mexico sterilized about 25 percent of the inflows.[7]

2. Reserve requirements

The manipulation of reserve requirements, so as to achieve a reduction in the money multiplier and curtail the monetary expansion associated with the central bank intervention in the foreign exchange market, has also taken a variety of forms (see Reinhart and Reinhart, 1995). Some countries have opted to simply increase the statutory reserve requirement on all domestic currency deposits. Leading examples of this policy are Costa Rica, the Czech Republic, Malaysia, and Sri Lanka. At the start of the inflow episode in 1989 Malaysia's statutory reserve requirement was 3.5 percent, by early 1994 it had been increased in multiple steps to 11.5 percent (Table 2). Other countries (Colombia 1991) imposed high *marginal* reserve requirements. In several countries where banks receive foreign currency deposits, Chile, Peru and Sri Lanka, reserve requirements on these accounts were either imposed for the first time or increased. While this latter measure does not affect the narrow-money multiplier (M1), it reduces the expansion in the broader aggregates. In some countries, financial sector reform and liberalization took place during or shortly before the large inflows of capital and this process led to *reductions* in reserve requirements. For example, in April 1989 Mexico eliminated reserve requirements and these were replaced by a 30 percent liquidity ratio, which could be held in the form of interest-bearing government paper.[8] Argentina also had reductions in reserve requirements during the inflow period. In the case of the Philippines, the Bangko Central announced a reduction in reserve requirements in August 1994 with the objective of inducing a decline in domestic interest rates, so as to narrow the domestic/international interest rate spread and reduce capital inflows (see Alfiler, 1994).

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[6] In the cases of Indonesia and Malaysia other forms of sterilization, besides open market operations, were also being used during those periods. These will be subsequently discussed.

[7] Banco de Mexico (1993).

[8] See Coorey (1992).

Since reserve requirements are a tax on the banking system, and since banks are likely to pass on all or a part of the tax to its clients, an interesting issue is to see if the higher tax is passed on to depositors or to borrowers. If its the former, it lowers domestic deposit rates and acts as a disincentive to capital inflows. If it increases lending rates, it may induce firms to borrow abroad, stimulating further inflows. However, as shown in Reinhart and Reinhart (1995) in the context of Dornbusch's overshooting model, if borrowers have limited access to international capital markets (as is the case in most of these countries) raising reserve requirements has all the intended effects on economic activity, the real exchange rate, and the current account.

While the issue is an empirical one, it appears that in the majority of cases considered here both deposit and lending rates adjusted (see Reinhart and Reinhart, 1995). Hence, as with open market operations its impact on capital flows may run in the opposite direction of what was intended. Further, if disintermediation occurs, and transactions increasingly take place in other financial institutions which are not subject to the requirements, a reserve requirement change may not produce the desired effect.[9] These nonbank institutions may also have the unappealing feature that they may be more difficult to supervise and regulate.

3. Management of government deposits and of the funds

Indonesia, Malaysia, Taiwan Province of China, and Thailand have all at various times followed a policy of shifting the deposits of the public sector and/or pension funds from the banking system to the central bank (Table 3).[10] In the case of Mexico, during 1991 the Mexican government also placed the proceeds of its privatizations in the central bank.

If these deposits are counted as part of the money stock then the transfer to the central bank works in the same way as an increase in reserve requirements (as the reserve requirement on those deposits is effectively increased to 100 percent). If the deposits are not counted as part of the money stock, then the shift is more akin to a liquidity-draining open market operation with the difference that the central bank may not have to pay a market rate of interest on its deposits as it would on its sterilization bonds. This mode of sterilization has several advantages. It does not constitute a tax on the banking system, nor does it appear to increase short-term interest rates as much as sales of sterilization bonds often do. If the deposits are not renumerated, there is no quasi-fiscal cost; if they are renumerated at below-market interest rates, there is a quasi-fiscal cost, but it is below the cost if open market operations had been used.[11] However, large and unforeseen deposit withdrawals could complicate banks' cash management. In addition, to the extent that some of the funds are not public sector deposits but along the lines of Malaysia's Employee Provident Fund (EPF) or Singapore's Central Provident Fund

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[9] See Calvo, Leiderman, and Reinhart (1994) and Folkerts-Landau et. al (1994).

[10] See Reisen (1993) and Folkerts-Landau (1994).

[11] Quasi-fiscal costs are reduced or eliminated by transferring these costs to the government (i.e. by making them explicit fiscal costs).

(CPF), the cost of these policies is paid by those who contribute to the fund; it is a form of financial repression. Lastly, such policies may be limited in scope by the availability of the eligible funds. For instance, government deposits held at the Bank of Thailand increased from 25 percent of total deposits at the end of 1987 to 82 percent in mid-1992, suggesting the scope for further manoeuver may be limited.

4. Effects on interest rates, spreads, and capital flows

As noted earlier, there are several distinct and well-defined episodes of intensive sterilization efforts which may offer an opportunity to gauge what some of the macroeconomic effects of these policies are. The main episodes examined include: Chile during the first half of 1990; Colombia in most of 1991; Indonesia during 1991-92; Malaysia from mid-1991 through early 1993. A number of empirical regularities characterize the episodes.

First, in all cases there is a particularly marked accumulation of international reserves, suggesting a great degree of central bank intervention in order to avoid or mitigate an exchange rate appreciation (Chart 1).

Second, despite the heavy foreign exchange intervention by the central banks, in all cases either the rate of devaluation slows down, or there is a revaluation (Malaysia). These two observations jointly, attest to the large orders of magnitudes of the inflows (Chart 2).

Third, reflecting the heavy open market operations, issuance of central bank notes increases dramatically (in both absolute terms and relative to the monetary base) in a relatively short period of time. In the case of Colombia the ratio of open market paper to the monetary base increases from less than 30 percent in late 1990 to over 80 percent by October 1991. In Chile that ratio rises by more than 100 percent in a period of six months. In Indonesia, there is a similar surge in outstanding Bank Indonesia Certificates (see Chart 3). In Malaysia, where the central bank was selling treasury bills and Bank Negara Bills (BNB), as well as borrowing heavily in the interbank market, a more comprehensive indicator of the sterilization effort is required. Chart 3 presents such a broad measure of central bank liquidity operations. In 1990, during the first year of heavy inflows, Bank Negara increased liquidity by US$6.5 billion; by 1993 the last year of the heavy sterilization effort (capital controls were imposed at the beginning of 1994), Bank Negara was draining liquidity at a rate of US$40.3 billion a year.

Fourth, in all four episodes domestic short-term interest *rose* as the sterilization efforts got underway. This rise in short-term rates also materializes during sterilization efforts in Korea (1988-89), Sri Lanka (1992-93), and the Philippines (1992-93:IH).[12] The increase occurs despite heavy capital inflows, which other things equal would have tended to drive the domestic interest rate lower. In addition, in several of these countries

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[12] See Hettiarachchi and Herat (1994) for Sri Lanka and Alfilier (1994) for the Philippines. The Colombian experience is detailed in Rodriguez (1991). For a comprehensive study of the Indonesian case see Harinowo and Belchere (1994) while for Malaysian experience see Aziz (1994).

(including Chile and Colombia) the country risk premia appear to be declining during these episodes, which other things equal, should also allow for lower domestic interest rate.[13] Table 4 summarizes the evolution of interest rates before, during, and after the sterilization period. As Table 4 highlights, the rise in interest rates was often quite pronounced and, given the reduced rate of devaluation (or in the case of Malaysia an appreciation), the rise in ex-post *dollar* interest rates is even greater (Table 4). As noted earlier, imperfect asset substitutability may be a plausible explanation. The increased investor demand may fall on corporate bonds and equities, which may be poor substitutes for the short-term paper (or short-term treasuries) being supplied in increasing quantities by the central bank. In addition, given that the capital inflows usually coincided with a period of stronger economic activity (and, in some instances, declining inflation), it is not implausible to suppose that there was an increase in money demand. Hence, there was an unintended overshooting in the tightening of monetary policy. In any case, interest rates fell when sterilization policies were abandoned.

Fifth, and following from the previous observation, ex-post interest rate spreads (in dollars), which in the case of Malaysia had fallen with the initial wave of inflows, were kept high by the sterilization policies, suggesting that the policy response does have an impact, at least in the short run, in determining whether and how quickly domestic interest rates converge to international levels.[14] In all these cases, domestic short-term interest rate spreads remained relatively high to those of, say, Argentina, which did not undertake any form of sterilization (Chart 4). It appears, then, that the lesser the extent of sterilization, the quicker that domestic interest rates 'converge' to international levels. However, it is worth noting, that the monetary authorities ability to affect domestic interest rates and effectively control the money supply appears to erode over time.[15] Indeed this conclusion seems to run through many of the case studies on these countries (see Alfilier, 1994; Aziz, 1994; Harinowo and Belchere, 1994; Hettiarachchi and Herat, 1994; and Rodriguez, 1991). In all four cases considered, sterilization policies were either abandoned altogether, scaled back, or complemented by capital controls, as it became evident that the high domestic interest rates were attracting more inflows.

Lastly, in addition to attracting further short-term flows of funds, the rise in short-term interest rates (and interest rate differentials) associated with sterilized intervention if sustained for a sufficient period, may dampen investment demand with the cost of capital increasing while returns on less risky assets (such as on government paper) are rising. As a consequence, investment in financial assets might increase relative to investment in plant and equipment. Thus, sterilized intervention could encourage a shift in the composition of capital inflows away from long-term to short-term flows.

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[13] An indication of the evolution of country risk is given by the behavior of secondary market prices for loans, which were increasing sharply during these episodes (see Calvo, Leiderman, and Reinhart, 1993).

[14] Frankel (1994b), for instance, has suggested that expected devaluation can fully account for observed interest differentials. However, his result would not be inconsistent with a steady-state offset coefficient of unity.

[15] This is consistent with Schadler's et. al (1993) findings.

The experiences of several countries, with shifts in the size and composition of capital flows in response to sterilization policies are illustrated in Charts 5-9.[16] Argentina is included in the sample for comparison purposes since it is the one country that did not sterilize at all. As noted above, several of the rapidly growing economies in Southeast Asia (notably Indonesia, Malaysia, and Thailand; Charts 5, 6, and 7) in the late 1980s experienced dramatic increases in capital inflows which contributed to upward pressure on their exchange rates and eventually to potential overheating of their economies. As a result of the sterilization policies pursued, in all three countries, interest differentials rose sharply in 1990, inducing large inflows of short-term capital. With the interest differential narrowing as policy was eased and the exchange rate allowed to appreciate, short-term inflows to Thailand slacked off in 1991-92.[17] While in Indonesia the interest differential widened further in 1991-92, short-term capital inflows declined reflecting in part steps taken by the government to limit short-term foreign borrowing by public sector enterprises and new limits imposed on the open foreign currency positions of the commercial banks. In Malaysia, short-term inflows continued to rise in 1991-92 as the interest differential widened further. After 1991, the authorities reduced their intervention and allowed the exchange rate to appreciate. Despite a narrowing of the differential in 1993, short-term inflows rose, and the authorities moved in early 1994 to impose capital controls. In Chile (Chart 8), a sharp rise in the interest rate differential in 1989-90 contributed to a surge in short-term capital inflows. With the differential narrowing in 1991, short-term inflows subsided somewhat, before picking up again in 1992 as the differential widened and falling in 1993 as it narrowed.[18] Argentina over the period 1989-92 (Chart 9) faced a widening interest differential and a reversal of short-term capital flows from sizable outflows in 1989 to significant inflows in 1992 following the introduction of the currency board or 'Convertibility Plan' in April 1991. In the absence of sterilization policies, interest rates converged to world levels, the interest rate differential leveled out as did short-term capital inflows in 1993.

In all of these countries, short-term flows as a share of total capital inflows rose at least initially in response to sterilization of intervention. There does not appear, however, to have been any pronounced or sustained shift in the composition of capital inflows as a result of such intervention, owing possibly to the fact that the periods of sterilization were relatively brief or that other mitigating factors (principally those influencing foreign direct investment behavior) were present.

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16 The charts show for each of the countries (Argentina, Chile, Indonesia, Malaysia, and Thailand) the composition of capital flows, split between total and short-term flows; differentials between interest rates on domestic deposits and U.S. Treasury bills, adjusted for actual exchange rate changes; and international reserves and exchange rates. In the charts, a widening of interest rate differentials with international reserves rising and the exchange rate relatively steady would suggest that the authorities were at least partially sterilizing capital inflows.

17 The sharp rise in 1993 in short-term flows primarily reflected a reclassification of foreign loans from long-term to short-term flows when they were rebooked in the Bangkok offshore banking center after the center was opened.

18 Of course, Chile introduced a tax on short-term flows in mid-1991, making it difficult to distinguish whether short-term flows decline as a result of the easing in monetary policy, the new capital control, or both.

III EXCHANGE RATE POLICY

Rising capital inflows have tended to induce an appreciation of the nominal exchange rate. However, as discussed, the monetary authorities have often opted for an active intervention strategy so as to limit or avoid the nominal appreciation. The extent of intervention was, in turn, reflected in a large accumulation of international reserves in most of these countries (Charts 1 and 5-9), but as the inflows persisted and sterilization policies became more costly and/or more difficult to implement several countries opted to allow their currencies to respond more to market forces by either a discrete revaluation, increased exchange rate flexibility, or as in the cases of Chile and Colombia a combination of both. The remainder of this section reviews two related issues. First, it discusses the relative merits of allowing for greater exchange rate flexibility as a response to increasingly large international capital movements. Second, it reviews the experiences with these policies for a number of capital-importing countries.

1. Revaluation

An appreciation of the nominal exchange rate in response to increased demand for domestic assets can take place without the need for any policy action in more flexible exchange rate regimes. However, if the prevailing arrangement is one where the rate is set by the authorities (i.e. peg, crawling peg, narrow band), then, at some point, a decision has to be made whether a realignment will be undertaken. There are several advantages to allowing the nominal exchange rate to appreciate during periods of heavy capital inflows (see Calvo, Leiderman, and Reinhart, 1994). First, it insulates the money supply, domestic credit, and the banking system from the inflows; this is particularly desirable if the inflows are perceived to be of a highly reversible nature. If banking supervision is weak and there are inefficiencies in pricing risk, there may be additional reasons to limit banks' role in intermediating the capital inflows. Second, if the economic 'fundamentals' warrant a real exchange rate appreciation, the adjustment comes via the exchange rate and not via higher inflation. Third, and related to the previous point, because of the pass-through from the exchange rate to domestic prices, an appreciation may help reduce inflation.

Despite the advantages of allowing the exchange rate to adjust to changing market conditions, revaluations have been a relatively uncommon response to surging capital inflows (hence the prevalence of sterilized intervention policies). Chile and Colombia are the two examples where revaluations have been a part of the policy response and even there, the realignment was sought only after it became evident that the inflows and the exchange rate pressures were more persistent than initially believed. Between April 1991 and June 1991 Chile's band was revalued by a cumulative 3.4 percent (Table 5). Larger revaluations followed in January 1992 (5 percent) and November 1994 (9.5

percent) as the exchange rate became persistently stuck to the bottom of the band.[19] A similar pattern emerged in Colombia, where a crawling peg system had been in place for about 25 years (see Carrasquilla, 1995). Still within the context of a peg, the exchange rate was revalued by 2.6 percent in June 1991. The more substantial realignments occured much later in 1994 (5 and 7 percent in January and November respectively), in the context of the newly established exchange rate band.

2. Greater exchange rate flexibility

Over and beyond the reasons given above for allowing the exchange rate to adjust in response to a shift in capital flows, there are other motives for allowing the exchange rate to *fluctuate* more freely in the presence of large capital inflows. First, it introduces some uncertainty that may well discourage some of the purely speculative (and highly reversible) inflows. Bacchetta and van Wincoop (1994) argue, in the context of a two-country model, that an increase in exchange rate uncertainty creates a bias toward the domestic asset (since the rate of return on the foreign asset is now more uncertain), dampens the sensitivity of the current account to most types of shocks, and reduces net capital flows. Indeed, the higher uncertainty acts like a Tobin tax. In the event of capital outflows, the greater flexibility takes some of the pressure off foreign exchange reserves. Second, it grants the monetary authorities a greater degree of independence and permits them to exercise more control over the monetary aggregates.

The main disadvantage of a pure float is that massive capital flows may induce steep and *abrupt* movements in the real exchange rate, which, in turn, may impose a substantial adjustment burden on the economy. In particular, the concern in many countries has been that real appreciation will harm strategic sectors of the economy, like the nontraditional export sector. If the inflows are temporary and if there are hysteresis effects on exports from the real exchange rate appreciation, there may be reasons for avoiding or dampening the real exchange rate adjustment (see Krugman, 1987). Some empirical evidence (see, for instance, Grobar, 1993) suggests that greater real exchange rate volatility may have negative effects on tradable-goods sectors. This result may be due to the existence of incomplete markets, to the extent that financial markets do not provide enough instruments to hedge against such uncertainty.

There is a wide degree of cross-country variation in the degree of exchange rate flexibility among the capital importing countries. While some countries, such as Peru and the Philippines have a float, the common ground appears to be that all central banks intervene in the foreign exchange market to some degree and no country has operated under a *pure* float. Among the Asian countries Indonesia widened its intervention band twice (Table 6) and Malaysia and the Philippines have allowed greater variability in the exchange rate, particularly since 1992 (See Table 7). Korea intends to further widen the margins for daily exchange rate fluctuations, with the aim of moving toward a free float in two to three years.[20] Among the Latin American countries, Chile, Mexico and more

[19] See Budnevich and Cifuentes (1993).

[20] In the past two years, however, Korea's exchange rate policy has been characterized by massive exchange rate intervention in response to capital inflows.

recently Colombia have allowed some degree of exchange rate flexibility in the context of their exchange rate bands. Both Chile and Mexico widened their bands (Table 6 provides details), and especially in Chile the exchange rate has been allowed to extensively fluctuate within the band.[21]

However, as Table 7 highlights, despite announcements of wider bands, the variance of monthly exchange rates in some of these countries showed little change. The variance of monthly exchange rates in Indonesia, for example, did not change after the band was widened twice in 1994. Similarly, during 1992 and 1993 and most of 1994 the variance of the Mexican peso remained about the same as it was when the exchange rate was fixed (i.e. nil) and about the same as Argentina's exchange rate under the Convertibility plan. This pattern is also evident in the daily data (see Chart 10). By contrast, there was a marked jump in the variance of the exchange rate in Colombia after the introduction of the band in January 1994 and a more moderate, but nonetheless noticeable increase in exchange rate variance in the case of Malaysia.

It is difficult to assess conclusively whether the greater variability (and therefore the greater short-run uncertainty) in the exchange rate was successful in deterring short-term flows even in the cases where the variance changes considerably. In the case of Chile, where short-term flows as a proportion of total flows have declined, there were other impediments to short-term inflows (i.e. capital controls).[22] In the case of Colombia, where the composition of flows show a similar pattern to Chile's, the introduction of the band coincides with the imposition of a tax on short-term borrowing making it difficult to isolate the effects of individual policies. For Malaysia, the effects of increased exchange rate variability may have been offset by tight money policies which, as argued in the previous section, kept short-term domestic interest rates above world levels.

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[21] On various aspects of exchange rate bands in Chile and Mexico, see Helpman, Leiderman, and Bufman (1993).

[22] See Reinhart and Smith (1995).

IV FISCAL POLICIES

Another policy reaction to capital inflows has been to tighten fiscal policy either by reducing expenditure, increasing taxes, or both (Table 8). The idea is to use fiscal restraint so as to lower aggregate demand and curb the potentially inflationary impact of capital inflows. There are likely to be, however, important differences in the macroeconomic effects of how the fiscal gap is closed. For instance, if government expenditure is more heavily weighted toward the nontraded good than private expenditure, then a cut in government spending may be a more effective way of alleviating pressures on the real exchange rate than heavier taxation of the private sector. Further, if consumer credit is readily available, as it usually is during periods of heavy capital inflows, the greater availability of financing may compensate for the reduction in disposable income. This is particularly so if the tax is perceived as temporary. However, a contraction of government expenditure is always a sensitive political issue and it can not be undertaken on short notice. Such delays increase the risk that, ex-post, the policy is procyclical. Further, fiscal policy is usually set on the basis of medium or long-term considerations, such as infrastructure and social spending needs, rather than in response to what may turn out to be short-term fluctuations in international capital movements (Bercuson and Koenig, 1993).

The clearest example of fiscal restraint a key policy response the capital inflow is Thailand, particularly during 1988-91 (see also Schadler et. al, 1993; and Nijathaworn and Dejthamrong, 1994). A combination of moderation of government expenditure (particularly public consumption), a strong cyclical improvement in revenues (real GDP growth averaged 11.3 percent during 1988-91).[23] The government budgetary balance (as a percent of GDP) swings from a deficit of 1.4 percent to a surplus of 4.9 percent in 1991. However, as noted, there may be a tradeoff for fiscal policy between the medium or long-term goals and short-run considerations. Thailand provides an example of this policy dilemma. The booming growth of the economy has generated a need to improve the country's infrastructure (which is no longer adequate if rapid growth is to be sustained). At the same time, the pressures on the real exchange rate that accompany the surge in inflows could warrant fiscal restraint, particularly if no other substantive macroeconomic measures are being implemented to deal with the inflow. However, infrastructure bottlenecks are not exclusive to Thailand; Malaysia, which has had an average growth rate of above 8 percent for seven consecutive years, faces similar constraints.

Chile from mid-1990 to the present has also sought fiscal restraint through an increase in the value added and corporate taxes and by moderating expenditures. By substantially limiting public consumption, Malaysia also began to downsize its public sector during

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[23] Public consumption as a share of GDP, which averaged 13.6 percent during 1984-88 declines to 9.9 percent during 1989-93--the early years of the surge in capital inflows (see Calvo, Leiderman, and Reinhart, 1994).

1992. In that year the overall public sector deficit shrank by about one percent of GDP to around 1.5 percent of GDP. However, for most of the other capital-importing countries fiscal policy has not been a key tool in responding to rising capital inflows. Indeed, many of the fiscal austerity measures that were undertaken in a number of developing countries in the early 1990s were part of domestic inflation stabilization plans, privatization efforts, and/or adjustments associated with Fund programs that were begun at that time or already underway. Examples of such consolidation efforts include Argentina, Mexico, and Sri Lanka.

Hence, because of lags and difficulties in initiating a policy change and because of its medium-term goal fiscal policy is not a particularly effective means of dealing with capital inflows, particularly if these are temporary and subject to abrupt changes. There are also important asymmetries in using fiscal policy to deal with fluctuations in international capital flows. In particular, while a fiscal tightening has sometimes been suggested as a means of dealing with inflows, a loosening of fiscal policy would not be advocated to deal with outflows--especially if the loose fiscal policy leads to a more accommodative monetary policy.

V CAPITAL ACCOUNT MEASURES

This section first reviews the recent experience with measures directed at reducing the volume of capital inflows--or altering their composition--and then discusses policies aimed at encouraging capital outflows.

1. Taxing short-term flows and prudential regulation

One policy to directly reduce net inflows is the taxation of gross inflows, possibly in the form of a tax that falls more heavily on short-term inflows. The policies adopted by Chile in 1991 and Colombia in 1993 and, more recently, in Thailand in 1996 fall in that category. In these cases a nonremunerated reserve requirement is to be deposited at the Central Bank on liabilities in foreign currency from direct borrowing by firms. In the case of Colombia, the reserve requirement is to be maintained for the duration of the loan and applies to all loans with a maturity of five years or less, except for trade credit with a maturity of four months or less. The percentage of the requirement declines as the maturity lengthens; from 140 percent for funds that are 30 days or less to 42.8 percent for five year funds. For Chile, the tax is of the form of a nonremunerated 30 percent reserve requirement to be deposited at the Central Bank for a period of one year on liabilities in foreign currency from direct borrowing by firms. In principle, because of their breadth, these measures affect the household sector, nonfinancial business, and the banking system's ability to borrow offshore.

Brazil has implemented a variety of taxes on inflows, with greater variation across assets as well as across maturities. As in the cases of Chile and Colombia, the tax on foreign issuance of bonds falls on the borrower. However, some other taxes are paid by foreign lenders. Notably, foreigners investing in the stock market have to pay a one percent tax *upfront*.[24] Hence the tax will fall more heavily on active investors which trade more often and hold stock for only relatively short periods of time and less heavily on more passive 'buy and hold' investors. These measures are designed to target the speculative, 'hot money' variety of capital inflows. The tax to be paid by foreigners on fixed-income investments has similar characteristics.

The main disadvantage with these measures is that flows are likely to be re-routed through other channels. For example, through over/under-invoicing of imports and exports since trade credits are exempt from the tax (see Mathieson and Suarez, 1993). Others have argued that, in the case of Chile, over-invoicing of imports is not likely to be an attractive alternative since imports are taxed at a comparable rate (see Labán and Larraín, 1993).[25] Indeed, inflows to Chile in 1991 were below those observed in 1990,

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[24] This was eliminated on March 10, 1995, in order to encourage inflows on the wake of the Mexican crisis.

[25] However, some circumvention of the tax is effected by reclassifying loans as trade-related.

possibly attesting to the success of this policy. While net inflows increased, once again, in 1992 and beyond, the increases came primarily in foreign direct investment and other long term flows. A similar pattern emerges in Colombia during 1994, with short-term flows accounting for a declining share of total flows; However, *total* inflows to Colombia continued to increase in 1994.

In other instances, capital controls have been quantitative in nature. Measures implemented have included prudential limits, or prohibition, on non-trade related swap activities, offshore borrowing, and banks' net open market foreign exchange positions (Indonesia, Malaysia, Philippines, Thailand), caps on banks' foreign currency liabilities (Mexico), or more blanket measures that prohibited domestic residents from selling short-term money-market instruments to foreigners (Malaysia).

In the case of Malaysia, a combination of wide domestic/foreign interest rate differentials and widespread expectation of an appreciation of the ringgit during the late 1993 led to a surge in short-term capital inflows which culminated with the imposition of six measures to restrict inflows in January 1994. The inflows came in the form of a marked rise in short-term bank deposits and were seen as speculative in nature. Consequently, most of the measures were directed toward the control of the activities of the financial sector and most were announced to be temporary (see Aziz, 1994; and Reinhart ans Smith, 1996). It appears that the most successful of these measures in reducing short-term inflows, was that which prohibited domestic residents from selling short-term money-market instruments to foreigners; as the certificates of deposits (CDs) matured and could not be rolled over, short-term inflows (and the monetary aggregates) began to shrink. The combination of abandoning sterilization policies and the imposition of capital controls appear to have been successful in reducing domestic interest rates and short-term inflows. However, as with taxation of inflows, if such policies are maintained indefinitely they will likely reduce the competitiveness and retard the development of the financial sector.[26] As far as the foreign investor is concerned, the cost of this measure (if any), was the foregone return from not being able to roll-over CDs. However, this opportunity cost does not appear substantial since, as noted, in 1994 Malaysian short-term interest rates converged to world levels.

In April 1992 Mexico passed a regulation that limited foreign currency liabilities of commercial banks to 10 percent of their total loan portfolio. However, it is not clear to what extent this measure acted to reduce the size of the capital inflows, since banks' total loan portfolios had been expanding rapidly throughout that period and the initial share of loans in foreign currency was below the 10 percent limit. For example, during 1992 bank assets grew by 41 percent while foreign currency loans grew by 88 percent; a similar pattern emerges in 1993, with foreign currency loans increasing by 50 percent while total loans rose by 25. Indeed, the constraint only appears to have become binding in 1994 when total and foreign currency loans both rose by 27 percent.

Based on the recent experiences of these selected countries with policies directed toward curbing short-term capital inflows, two observations stand out. First, reviewing the

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[26] Malaysia removed most capital controls during the second half of 1994.

Chilean and Malaysian experience it appears that, at least in the short run, these two distinctly different policies were successful in reducing the *volume* of inflows in a relatively brief period of time. Hence, if the inflows are largely seen as a temporary phenomenon, such policies could be quite effective; the longer the inflows persist or the longer the policies remain in place, however, the greater the chances that the controls become less binding. Second, it could be argued that the effect these policies had on the *composition* of flows (this also applies to Colombia) was the 'desired' effect of lengthening maturities.

2. Liberalizing capital outflows

A different approach to tempering the impact of large gross capital inflows has been to remove controls on capital outflows and thereby increase outflows which lowers net inflows. These policies have usually allowed domestic investors (notably, pension funds) to acquire foreign assets. Chile, Colombia, Malaysia, Mexico, Philippines, Sri Lanka, and Thailand are among those that have liberalized capital outflows (see Table 9). This approach is less direct than taxation or controls on gross inflows for several reasons. First, it assumes that the existing controls on outflows were binding, a proposition that has been questioned by several studies (see Dooley, 1995 for a review of this literature). Second, it relies on the assumption that a greater *ability* by domestic residents to invest abroad will translate into greater investment abroad. This may not occur if rate of return differentials favor markedly the domestic country. Finally, it assumes that gross inflows will *not* be affected in a *positive* manner by the liberalization announcement.

This last assumption is potentially problematic. It has been argued on both theoretical grounds and based on the evidence from a number of well-documented country cases (see Bartolini and Drazen, 1994; and Labán and Larraín, 1994) that liberalization of outflows has actually induced heavier inflows. Examples include: Italy and New Zealand in 1984, Spain in 1986, Yugoslavia in 1990 and Chile in 1990s. Lifting restrictions on capital outflows sends a 'positive signal,' increasing the confidence of the foreign investors and further stimulating capital inflows. In addition, the effectiveness of this policy in inducing outflows may be further undermined if domestic interest rates are being kept high relative to international levels (say by sterilization polices), since domestic residents would not have an inducement to shift into foreign assets (even though it is now permissible). Certainly, stock market returns in dollars during 1990-93 for several of the countries that liberalized (including Chile, Colombia, Malaysia, Mexico, and Thailand) far exceeded the returns available in major industrial countries. Lastly, given the massive capital flight that characterized the experience of many Latin American countries during most of the 1980s, it is not evident that, in many instances, such controls on outflows were particularly binding to begin with by the early 1990s.

3. Banking regulation and supervision

A major concern about the intermediation of international capital flows through the domestic banking system is that individual banks are subject to free or subsidized

deposit insurance; i.e., there is an implicit commitment by the authorities that banks--especially those of large size--will not be allowed to fail. It is well known that free implicit deposits' insurance induces banks to increase their risk exposure. In several countries, there has been a sharp expansion of bank loans to finance private consumption. There is evidence that in some of these countries the percentage of nonperforming loans has recently increased over time. In addition, banks may play little attention to the matching of the maturities of deposits against those for loans--the formally being typically shorter than the latter. Similarly, there could be a mismatch between the currency denomination of bank loans and the currency denomination of profits and incomes of the borrowing sector; e.g., consider the producer of a nontradable commodity borrowing in U.S. dollars to finance his activity. All these factors increase the vulnerability of the financial system to reversals in capital flows--reversals that have the potential to end in financial crises.

It is the role of bank regulation and supervision to effectively diminish some of these risks. As discussed earlier, attempting to insulate the banking system from short-term capital flows is a particularly important goal in cases where a substantial proportion of the inflows are in the form of short-term bank deposits. Regulation that limits the exposure of banks to the volatility in equity and real estate markets could help insulate the banking system from the potential bubbles associated with sizable capital inflows. In this vein, risk-based capital requirements in conjunction with adequate banking supervision to insure such requirements are complied with could help insulate the domestic banking system from the vagaries of capital flows.

VI POLICY MIX: SOME LESSONS

A retrospective review of the policy response to the surge in capital inflows highlights the importance of how individual policies interact to either magnify or reduce the volume of inflows, affect their composition, and/or alter their macroeconomic consequences. For example, a combination of little or no short-term exchange rate uncertainty (as is the case when there is an implicit or explicit peg), sterilized intervention, which tends to prevent domestic short-term interest rates from converging toward international levels, and no binding impediments to capital inflows (through either taxation or quantitative constraints) is likely to maximize the volume of short-term capital inflows a country receives (this policy mix characterizes the Mexican experience during 1990-93 reasonably well, see Table 9). The pairing of little or no short-term exchange rate risk and relatively high domestic interest rates favors the short-term investor; for the long-term investor, there is always exchange rate risk since over longer horizons the probability of a realignment of the peg or a change in the exchange rate regime increases. Further, longer-term investments (such as foreign direct investment) tend to be less interest sensitive. Hence, it would not be surprising to see that if such a policy mix remains in place for any extended period of time it may end up skewing the composition of inflows toward the short end of the maturity spectrum.

Similarly, it could be argued that the mix of sterilized intervention and controls on inflows may undermine the 'individual effectiveness' of these policies. The comparatively high interest rate differentials that usually accompany sterilization may act as an inducement to circumvent the capital controls (i.e. firms and banks may find ways of borrowing offshore). To the extent that they are successful in dodging the controls, this tends to offset some of the contractionary effects of the sterilization efforts. Along the same lines, liberalizing controls on outflows as a policy aimed at reducing net capital inflows may backfire if domestic interest rates are high relative to international levels and/or if it is interpreted a positive signal of the future economic/policy environment. Indeed, several countries (Chile, Malaysia, and Thailand, see Table 10) liberalized outflows while at the same time engaging in substantive sterilization efforts.

TABLE 1A
STERILIZATION THROUGH OPEN MARKET OPERATIONS: AFRICA AND ASIA

Egypt (1991)
February, 1991-1994: Sterilization was done through open market sales of treasury bills.

Indonesia (1990)
February, 1991: Significant monetary tightening. Sales of SBIs increase sharply.
March, 1991: State enterprises were instructed to convert Rp 10 trillion in bank deposits to Bank Indonesia certificates (SBIs).
May, 1993: Monetary policy begins to ease and sterilization efforts diminish.

Kenya (1993)
October, 1993-March, 1994: Large-scale sterilization through increased sales by the Central Bank of Kenya of treasury bills.

Korea (1992)
April, 1993: Korea begins to sterilize through auctions of monetary stabilization bonds (MSB). Previously open market operations consisted of a mandatory allocation scheme whereby the Bank of Korea allocated securities at controlled, below-market interest rates.

Malaysia (1989)
1990: Central Bank begins to borrow in interbank market.
1992: Heavy open market operations begin as the Central Bank steps up sales of Treasury bills and borrows heavily in the interbank market.
February 10, 1993: Bank Negara begins to issue Bank Negara Bills (BNB), which are similar to Malaysian Government Treasury bills. This move was prompted by the need to have an instrument thorough which to conduct open market operations, since Treasuries issuance was dwindling in line with the shrinking government deficit. During the first half of 1993 issuance is RM 9,300 billion during the second half issuance tapers off to RM 4,300 billion.
February 16, 1993: The central bank sells the first issues of the Malaysia Savings Bond MSB) RM 1 billion.

Philippines (1992)
1992: Sterilization efforts intensify through issuance of Central Bank bills and borrowings under the Central Bank reverse repurchase facility. Further, in view of the Central Bank's lack of holding of Treasury bills, the government was called to issue government securities and deposit the proceeds with the Central Bank.
mid-1993: Sterilization efforts diminish and the government shifts its deposits out of the Central Bank to commercial banks. More adjustment comes through allowing the nominal exchange rate to appreciate.

Sri Lanka (1991)
1991-92: Intense sterilization efforts through open market operations of Treasury bills.
mid-1993: After depleting its holdings of Treasury bills, the Central Bank begins to issue paper in order to conduct open market operations. Sterilization efforts moderate.

Thailand (1988)

1989-91: Heavy sterilization period. During this period the Bank of Thailand increases its rediscount rate from 8 percent at the end of 1989 to 12 percent at the end of 1990.

late 1989: The Central Bank reduces commercial banks access to refinancing facilities. The amount of refinancing was reduced from 100 percent to 50 percent of the face value of qualifying notes.

Mid-1993: Sterilization efforts cease.

Uganda (1993)

1993-April, 1994: Sterilization took place through central bank sales of treasury bill. Due to insufficient new issues and the lack of a well-developed secondary market, it became increasingly difficult for the central bank to pursue sterilization policies for an extended period of time.

Sources: Alfiler (1994), Asea and Reinhart (1995), Aziz (1994), Banco de Mexico, Informe Anual 1993, Bank Negara Annual Report, various issues, Hettiarachchi and Herat (1994), Nijathaworn and Dejthamrong (1994).

Note: The date next to the country name denotes the first year of the surge in inflows.

TABLE 1B
STERILIZATION THROUGH OPEN MARKET OPERATIONS:
EASTERN EUROPE AND LATIN AMERICA

Chile (1990)

January 5, 1990: Large scale sterilization efforts begin with the Central Bank increasing its long-term real interest rate on its bonds from 6.9 percent to 9.7 percent and its 90-day paper from 6.8 to 8.7 percent.

August 17, 1990: Short-term rates begin a moderate decline (from 8.7 to 8.2 percent).

March 18, 1991: Further easing of policy with 90-day paper reaching 5.7 percent and 360-day paper declining from 9.2 to 5.9.

April 2, 1992: Further easing with bond rate reduced from 9.7 percent to 6.6 percent.

August 20, 1992: Policy begins to tighten with short-term rate rising to 5.7 percent.

November 2, 1992: Further tightening with short-term rate rising to 6.5 percent and long-term rate rising to 7.7 percent.

September, 1993: Yield curve becomes inverted with 10-year bond rate at 6.4 percent and short rates remaining at 6.5 percent.

November 2, 1992: Further tightening

Colombia (1991)

January, 1991: Heavy sterilization of inflows begins.

October, 1991: Sterilization policies are abandoned.

Czech Republic (1992)

August, 1994-March, 1995: Sterilization policies are conducted through heavy sales of government securities and central bank paper.

Mexico (1990)

1990-1993: Partial sterilization of inflows through sales of government paper, mostly domestic currency-denominated CETES.

Sources: Aziz (1994), Banco Central de Chile Memoria Anual, various issues, Banco Central de Chile, Evolucion de la Economia, various issues, Bank Negara Annual Report, various issues, Harinowo and Belchere (1994), Kang (1994), Laporan Mingguan Weekly Report, various issues.

Note: The date next to the country name denotes the first year of the surge in inflows.

TABLE 2A
CHANGES IN RESERVE REQUIREMENTS: AFRICA AND ASIA

Kenya (1992)

October 1993-March 1994: Statutory cash ratio is increased in three steps from 12 percent to 20 percent.

Indonesia (1990)

December 14, 1995: Commercial bank reserve requirement is raised from 2 percent to 3 percent.

Malaysia (1989)

May 2, 1989: Reserve requirement is increased to 4.5 percent from 3.5 percent for commercial banks and 3.0 percent for finance companies.

October 16, 1989: Reserve requirement is increased from 4.5 to 5.5 percent.

January 16, 1990: Reserve requirement is increased from 5.5 to 6.5 percent.

August 16, 1991: Reserve requirement is increased form 6.5 to 7.5 percent.

September 16, 1991: All outstanding ringgit received through swap transactions with non-residents, including offshore banks, would be included in the eligible liabilities base and be subject to the statutory reserve requirements.

May 2, 1992: Reserve requirement raised to from 7.5 to 8.5 percent.

January 3, 1994: Reserve requirement increased from 8.5 to 9.5 percent. The reserve requirement is extended to cover foreign currency deposits and transactions (such as foreign currency borrowing from foreign banking institutions and interbank borrowing). Previously it had only applied to ringgit-denominated transactions.

1994: Reserve requirement increased in two steps to 11.5 percent.

February 1, 1996: Reserve requirement raised to 12.5 percent.

Philippines (1992)

August 15, 1994: The reserve requirement is reduced from 20 percent to 17 percent with the objective of inducing a decline in domestic interest rates.

Sri Lanka (1991)

November 1, 1991: Reserve requirement raised to 13 percent.

January 24, 1992: Reserve requirement raised to 14 percent from 13 percent.

September 4, 1992: Reserve requirement extended to include foreign currency deposits.

September 24, 1992: Reserve requirement lowered back to 13 percent.

January 29, 1993: Reserve requirement raised 0.5 to 13.5 percent.

April 16, 1993: Reserve requirement raised to 14 percent.

May 21, 1993: Reserve requirement raised to 15 percent.

Source: Hettiarachchi and Herat (1994).

Note: The date next to the country name denotes the first year of the surge in inflows.

TABLE 2B
CHANGES IN RESERVE REQUIREMENTS: EASTERN EUROPE AND LATIN AMERICA

Argentina (1991)

August 15, 1993: Reserve requirements on domestic and foreign currency demand deposits were raised from 40 to 43 percent. A 3 percent reserve requirement on domestic and foreign currency 30-89 day time deposits was introduced.

Brazil (1992)

July 1, 1994: A 100 percent marginal reserve requirement on demand deposits and a 20 percent reserve requirement on time deposits is introduced. Reserve requirements on saving deposits are raised from 10-15 percent to 20 percent.

August 31, 1994: Reserve requirement on time and saving deposits are raised to 30 percent.

December 6, 1994: A 15 percent reserve requirement on loans for the purchases of goods is introduced.

April 28, 1995: Reserve requirement on time deposits is raised back from 27 percent to 30 percent. The marginal reserve requirement on certificates of deposit is raised to 60 percent. The reserve requirement on loans is raised from 6 percent to 18 percent.

Chile (1990)

January, 1992: Nonremunerated 20 percent reserve requirement on deposits and loans in foreign currency held by commercial banks. The reserve requirement must be maintained for one year.

May, 1992: Reserve requirement on foreign currency deposits and loans held by commercial banks is increased to 30 percent. The requirement was designed to make the tax rate fall as the maturity increases. A 30 percent marginal reserve requirement is on interbank deposits is introduced.

Colombia (1991)

January, 1991: Marginal reserve requirements of 100 percent were imposed on all new deposits. These reserves were held as interest-bearing central bank bonds.

September, 1991: The marginal reserve requirement was replaced by an increase in reserve requirements on most deposits.

Costa Rica (1991)

October 1992: Reserve requirement on domestic currency demand deposits is raised from 30 to 34 percent, and those on time deposits from 10 to 14 percent.

Czech Republic (1992)

August, 1994: Reserve requirements were raised from 9 percent to 12 percent.

Mexico (1990)

April, 1992: A compulsory liquidity coefficient for dollar liabilities was set at 15 percent. This coefficient must be invested in liquid securities denominated in the same currency.

Sources: Aziz (1994), Banco Central de Chile Memoria Anual, various issues, Banco Central de Chile, Evolucion de la Economia, various issues, Bank Negara Annual Report, various issues, Gurria (1993), and Hettiarachchi and Herat (1994),and Rodriguez (1991).

Note: The date next to the country name denotes the first year of the surge in inflows.

TABLE 3
STERILIZATION THROUGH MANAGEMENT OF GOVERNMENT FUNDS

Czech Republic (1992)

December, 1994-February, 1995: Commercial bank deposits of the National Property Fund, amounting to about Kc 16 billion (or 10 percent of reserve money) were transferred to the Czech National Bank.

May, 1995: An additional Kc 6 billion was transferred.

Malaysia (1989)

April, 1990: The Money Market Operations (MMO) Account on the accountant general maintained at the Central Bank was reactivated. Government deposits that were placed with the banking system maturing that year (about $3.7 billion) were withdrawn from the system and deposited in the MMO account.

1992-94: Transfer of government and Employee Provident Fund (EPF) deposits to the central bank.

Philippines (1992)

The National Government issues securities and deposits proceeds with the Central Bank.

Singapore

Savings of Central Provident Fund (CPF) are heavily invested in government bonds.

Taiwan Province of China

Postal savings were transferred from the domestic banks to the central bank.

Thailand (1988)

1987-mid-1992: Government deposits held at the Bank of Thailand increased from 25 percent of total deposits at the end of 1987 to 82 percent in mid-1992.

Sources: Aziz (1994), Bank Negara Annual Report, various issues, and Folkerts-Landau et. al. (1995).

Note: The date next to the country name denotes the first year of the surge in inflows.

TABLE 4
INTEREST RATES AND STERILIZATION POLICIES (In Percent, Annual Rates)

CHILE	In domestic Currency		Converted into dollars	
	Interest Rate on 30-89 days		Interest Rate on 30-89 days	
	loans	deposits	loans	deposits
Pre-inflow: 1988:1-89:12	28.54	21.41	16.83	10.39
Capital inflows and heavy sterilization 1990:1:90:7	46.58	37.80	35.16	27.01
Capital inflows and partial sterilization 1990:7-94:5	27.93	21.76	18.91	13.17

INDONESIA	In domestic Currency		Converted into dollars	
	Interest Rate on:		Interest Rate on:	
	Prime loans	90-day deposits	Prime loans	90-day deposits
Early stages of inflow period 1989:190:12	22.54	17.99	17.03	13.24
Capital inflows and heavy sterilization 1991:192:12	25.27	21.88	20.84	17.58
Capital inflows and moderate sterilization 1993:1-94:6	19.22	13.66	15.30	9.93

COLOMBIA	In domestic currency			Converted into dollars		
	Prime loans	90-day deposits	C.Bank Paper	Prime loans	90-day deposits	C.Bank Paper
Pre-inflow: 1989:1-90:12	44.14	34.41	33.79	3.74	3.29	11.25
Capital inflows and heavy sterilization 1991:1-91:11	47.16	36.61	42.08	10.31	14.7	18.85
Capital inflows and moderate sterilization 1991:12-93:12	36.95	26.2	24.31	11.08	9.42	20.53

MALAYSIA	In domestic currency	Converted into dollars
	Interest Rate on:	Interest Rate on:
	Deposits	Deposits
Early stages of inflow period: 1989:1-91:6	6.21	5.52
Capital inflows and heavy sterilization 1991:7-93:6	7.92	13.07
Capital inflows, moderate sterilization, and heavy foreign exchange intervention 1993:7-93:12	6.74	-4.87
Capital controls, currency appreciation 1994:1-94:6	5.3	18.19

TABLE 5
REVALUATIONS OF THE EXCHANGE RATE

Chile (1990)
April, 1991: The band is revalued by 0.7 percent.
May, 1991: The band is revalued by 0.7 percent.
June, 1991: The band is revalued by 2 percent.
January 23, 1992: The band is revalued by 5 percent.
November 30, 1994: The band is revalued by 9.5 percent.

Colombia (1991)
June, 1991: Nominal revaluation of 2.6 percent.
January, 1994: The band is revalued by 5 percent.
December, 1994: The band is revalued by 7 percent.

Sources: Banco Central de Chile Memoria Anual, various issues, Banco Central de Chile, Evolucion de la Economia, various issues, Carrasquilla (1995), and Schadler et. al. (1993).
Note: The date next to the country name denotes the first year of the surge in inflows.

TABLE 6
INCREASING EXCHANGE RATE FLEXIBILITY

Chile (1990)

January, 1992: The central parity is revalued by 5 percent and exchange rate band is widened from 10 percent to 20 percent, 10 percent on each side.

July, 1992: The exchange rate ceases to be pegged exclusively to the dollar and a peg to a basket of currencies (50 percent dollar, 30 percent deutsche mark, and 20 percent yen) is introduced.

November 30, 1994: The central parity is revalued by 9.5 percent. The weights of the currency basket are changed to 40 percent dollar, 35 percent deutsche mark, and 25 percent yen.

Colombia (1991)

January 25, 1994: An exchange rate band is introduced. The width of the band is 15 percent and the rate at which the band is to be devalued is equal to 11 percent per annum.

Czech Republic (1992)

February 28, 1996: An exchange rate band is introduced; the width of the band is 15 percent.

Indonesia (1990)

January, 1994: Intervention band widened from 10 to 20 rupiah.

August, 1994: Intervention band widened from 20 to 30 rupiah.

January 1, 1996: Intervention band widened from 2 percent to 3 percent.

Malaysia (1989)

mid-1991: Greater degree of flotation allowed.

Mexico (1990)

November 11, 1991: An exchange rate band is introduced. The upper-limit of the band was depreciated at the rate of 20 cents a day and the floor remained fixed. Its total width increased from 1.2 percent in November 1991 to 4.3 percent in December 1992.

October, 1992: The rate of crawl of the upper limit is increased to 40 cents per day. The band width reached 8.7 percent by the end of 1993.

Philippines (1992)

Mid-1992: Reduced foreign exchange intervention allowing for a nominal appreciation of the peso.

Sources: Aziz (1994), Alfiler (1994), Carrasquilla (1995), Harinowo and Belchere (1994), Gurria (1993), Helpman, Leiderman and Bufman (1995), and Schadler et al. (1993).

Note: The date next to the country name denotes the first year of the surge in inflows.

TABLE 7
EXCHANGE RATE VARIABILITY
(Variance of monthly exchange rate changes, in percent)

	Argentina (1991)	Chile (1990)	Colombia (1991)	Mexico (1990)	Indonesia (1990)	Malaysia (1989)	Philippines (1992)	Thailand (1988)
1988	54.18	0.91	0.05	0.56	0.07	0.65	0.21	0.40
1989	12788.58	2.66	0.01	0.01	0.07	0.80	0.16	0.41
1990	3768.23	2.22	0.07	0.07	0.03	0.17	6.16	0.27
1991	358.61 a)	1.22	0.05	0.02	0.02	0.76	0.58	0.37
1992	0.06	5.21	0.01	0.40	0.03	2.69	12.38	2.43
1993	0.07	0.76	0.01	0.09	0.02	2.95	6.43	0.15
1994	0.01	0.75	13.95	3.61	0.02	2.63	2.69	0.14

Source: International Financial Statistics, IFS.

Notes: The dates in parentheses indicate the year in which capital inflows began.

a) Convertibility Plan begins in April 1991.

TABLE 8
FISCAL AUSTERITY MEASURES

Chile (1990)

1990-1994: Moderation of expenditure. Nonfinacial public sector surplus averages 2.5 percent during this period.

Mid-1990: An increase in the value added tax rate to 18 percent. An increase in the corporate tax to 15 percent, and an increase in the progressiveness of the personal income tax.

Malaysia (1989)

1992-93: Fiscal consolidation. Real public consumption growth reduced significantly (0.4 percent in 1992). Public sector deficit reduced to about 1.5 percent of GDP.

Thailand (1988)

1988-1991: Moderation of government expenditure. Government budgetary balance (as a percent of GDP) swings from a deficit of 1.4 percent to a surplus of 4.9 percent in 1991.

1992: Introduction of a value added tax.

Sources: Gonzalez (1995), Nijathaworn and Dejthamrong (1994), and Schadler et. al. (1993).
Note: The date next to the country name denotes the first year of the surge in inflows.

TABLE 9A
LIBERALIZATION OF OUTFLOWS: ASIA

Malaysia (1989)

August, 1993: The minimum amount of equity that must be held by an indigenous Malay group, company or institution was lowered from 51% to 35%.

Philippines (1992)

July, 1994: a) Bangko Central raised the limit on outward investments sourced from the banking system from US$1 million to US$3 million. b) Restrictions on repatriation of investments (and earning accruing therefrom) funded by debt-to-equity conversions under the old debt restructuring program are lifted.

Sri Lanka (1990)

1993: Removal of limits on foreign currency working balances of commercial banks and a lower reserve ratio on foreign currency deposits to the extent that the funds were invested abroad.

Thailand (1988)

April, 1991: Foreign exchange earners allowed to open foreign exchange accounts with commercial banks in Thailand up to $500,000 for individuals and $2 million for corporations. Thai investors could freely transfer up to $5 million abroad for direct investment. Bank of Thailand approval requirement of repatriation of investment funds eliminated.

February, 1994: a) The amount of Thai baht that can be taken out to Vietnam and bordering countries was raised to B 500,000. b) The ceiling on the amount of foreign exchange that can be taken abroad for travelling expenses was eliminated (the previous ceiling was US $20,000).

Sources: Hettiarachchi and Herat (1994), Nijathaworn and Dejthamrong (1994), and Schadler et al. (1993).

Note: The date next to the country name denotes the first year of the surge in inflows.

TABLE 9B
LIBERALIZATION OF OUTFLOWS: LATIN AMERICA

Chile (1990)

April, 1990: New regulations liberalizing foreign exchange market operations. Previously, all foreign exchange market operations prohibited unless under Central Bank's specific authorization. New, all transactions permitted unless specifically restricted by Central Bank.

1991: In a number of steps (February, April, May, and October), commercial banks were permitted to increase external trade financing and use up to 25 percent of foreign exchange time deposits for foreign trade financing. Joint venture rules were simplified, and the waiting period for remitting capital invested in Chile under the debt conversion program was shortened. Procedures for enterprises to directly invest abroad were modified and made easier. (These types of transactions were already done through the legal informal market.)

March, 1992: a) Pension funds allowed to hold a portion of their portfolio in foreign assets (government bonds, certificates of deposit, and bankers' acceptances). Limit on these investments increased gradually to 10 percent of investment portfolio. b) Limit on net foreign exchange holdings of commercial banks was doubled. Share of export receipts exempt from surrender requirements increased. Allocations of foreign exchange for a variety of payments abroad (including travel) raised. Period for advance purchase of foreign exchange for debt service extended.

Colombia (1990)

June, 1990: Ceiling applicable to foreign currency deposits held by domestic commercial banks increases to 15 percent (from 8 percent).

October 22, 1991: Liberalization of foreign investment regime (under Resolution 51) to expand existing guarantees and ease the way to new investment. Foreign firms allowed to remit up to 100 percent of net annual profits.

December, 1991: Investors permitted to buy up to 100 percent locally listed companies. Abolition of restrictions on capital and income repatriation.

February, 1992: a) Export surrender requirement proceeds eased: all exporters allowed to retain part of export proceeds abroad. Previously, this was granted only to coffee growers and to state enterprises exporting oil and minerals. b) Residents allowed to hold foreign stocks and other foreign portfolio investments abroad up to $500,000. Higher amounts require approval of the National Planning Department.

February, 1992: Minimum maturity on foreign loans reduced from five years with two years' grace, to one year. Such loans permitted only to finance working capital or fixed investment. Limit on contractual interest rate (London interbank offered rate (LIBOR) + 2.5 percent) eliminated for the private sector.

April, 1994: a) Limits on foreign investments of domestic pension funds, insurance companies, and mutual funds were raised from 3 to 4 percent. b) The share of export proceeds subject to surrender requirements was reduced from 90 to 85 percent and the period of surrender of foreign exchange was extended from 150 to 180 days.

October, 1994: The share of export proceeds subject to surrender requirements was further reduced from 85 to 80 percent.

Mexico (1990)

November, 1991: Abolished foreign exchange surrender requirements and related exchange control measures permitting unification of controlled and free market exchange rates.

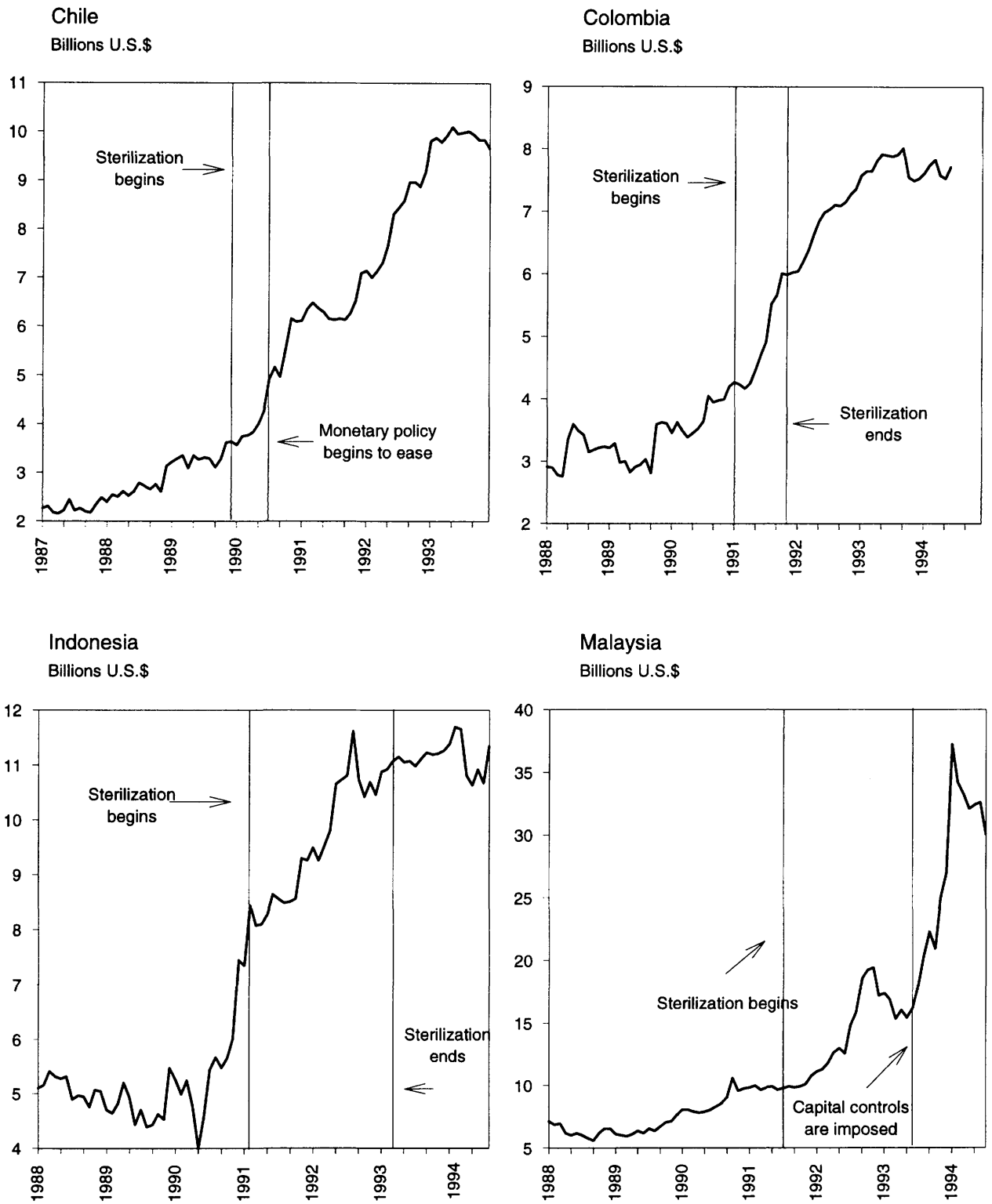
Sources: Gonzalez (1995), Labán and Larraín (1994), and Schadler et al. (1993).
Note: The date next to the country name denotes the first year of the surge in inflows.

TABLE 10
POLICY MIX IN RESPONSE TO THE CAPITAL INFLOWS

Country	Fiscal Restraint	Revaluation	Increased Exchange Rate Variability	Sterilized Intervention	Controls on Capital Inflows	Liberalization of Capital Outflows	Trade Liberalization Accelerated
Argentina	No 1)	No	No	No	No	No	No
Chile	Yes	Yes	Yes	Yes	Yes	Yes	No
Colombia	No	Yes	Yes	Yes	Yes	Yes	Yes
Indonesia	No	No	No 2)	Yes	Yes	No	No
Malaysia	Yes	No	Yes	Yes	Yes	Yes	Yes
Mexico	No 1)	No	No 2)	Yes	No 4)	Yes	Yes
Philippines	No	No	Yes 3)	Yes	No	Yes	No
Sri Lanka	No 1)	No	No 3)	Yes	No	No	Yes
Thailand	Yes	No	No	Yes	No	Yes	Yes

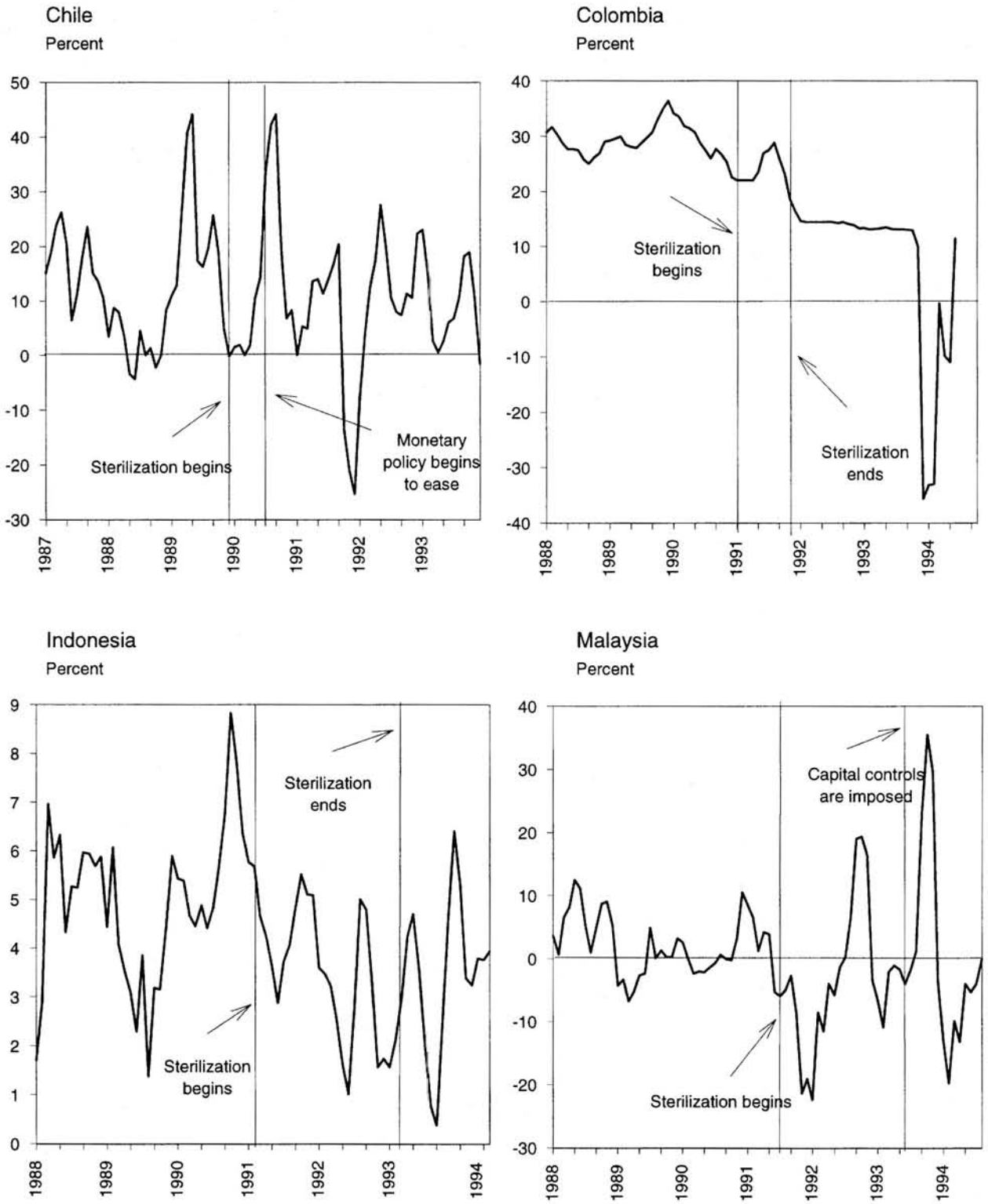
1) Fiscal consolidation (including privatization efforts) were part of the inflation stabilization programs and not a response to the rise in capital inflows per se. The Convertibility Plan in Argentina begins in April 1991 while the Mexican plan predates the surge in inflows and begins on December 1987.
2) Despite announcements of broader intervention bands, exchange rate variability does not change appreciably (see Section III of this paper).
3) The Philippines and Sri Lanka already had a relatively flexible exchange rate system at the start of the inflow episode.
4) Caps on foreign currency liabilities of banks are not binding until 1994 (see Reinhart and Smith, 1995).

CHART 1
STERILIZATION POLICIES AND INTERNATIONAL RESERVES



Source: IMF, International Financial Statistics.

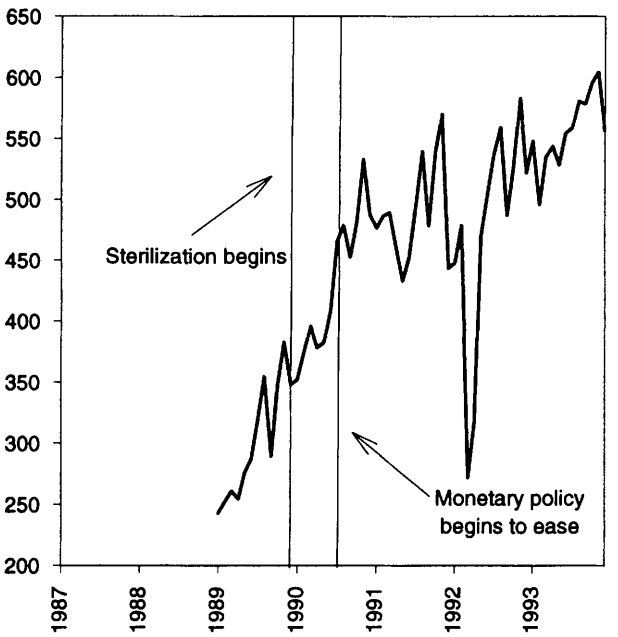
CHART 2
STERILIZATION POLICIES AND EXCHANGE RATES
(3 month percent change, annual rate)



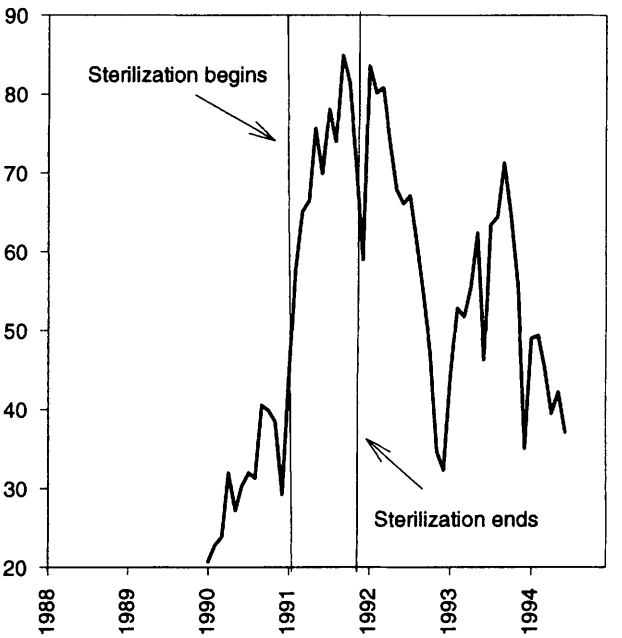
Source: IMF, International Financial Statistics.

CHART 3
INDICATORS OF STERILIZATION EFFORTS

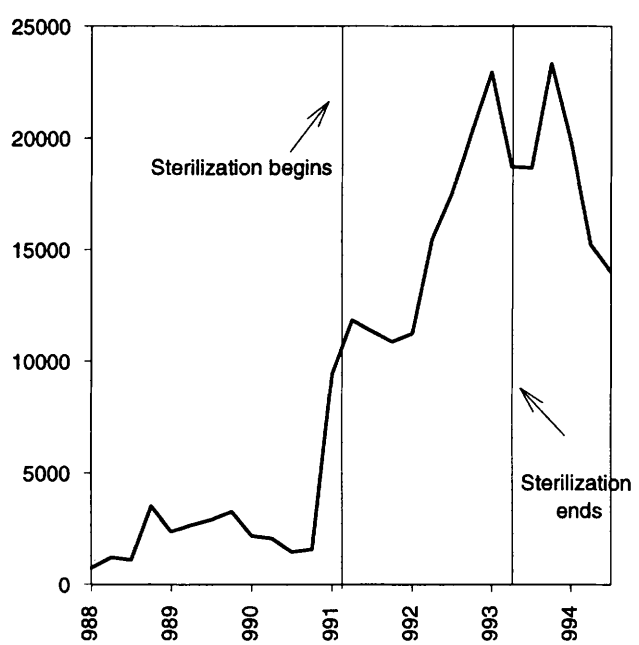
Chile: central bank notes/monetary base
Percent



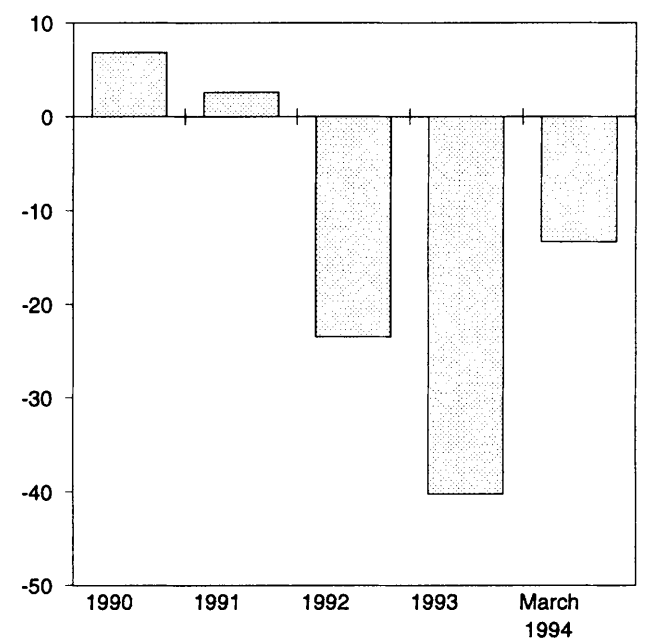
Colombia: central bank open market paper/monetary base
Percent



Bank Indonesia certificates outstanding
Billions of rupees



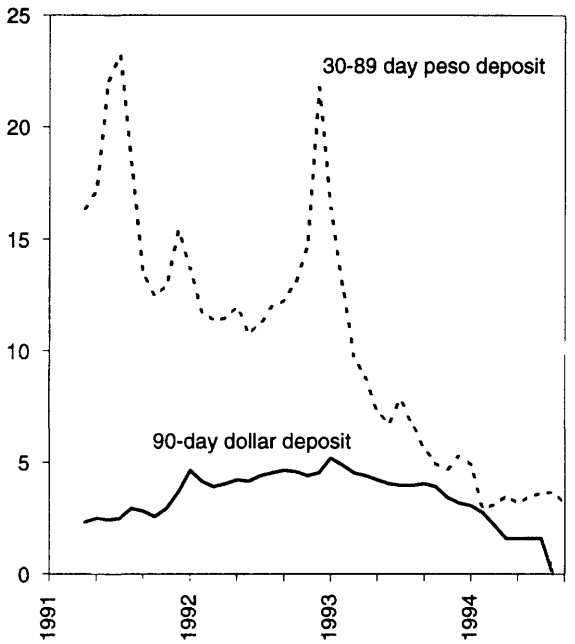
Malaysia central bank liquidity operations
Billions U.S.$



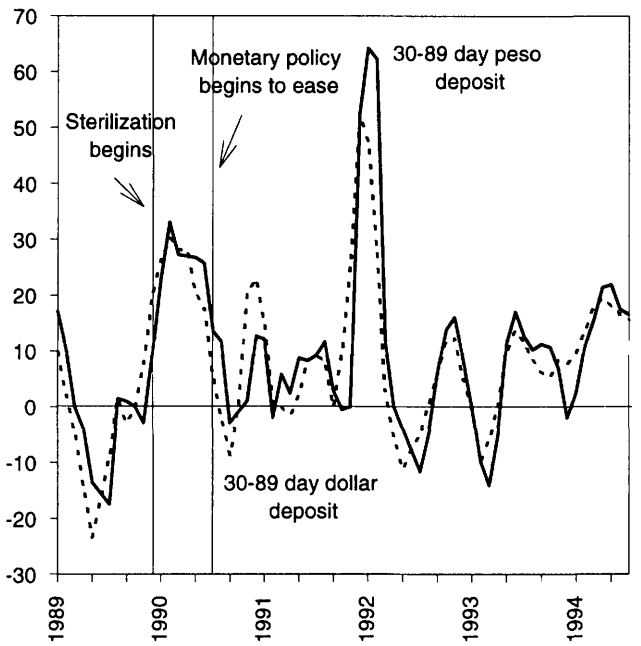
Sources: Banco Central de Chile, Banco de la Republica, Bank Indonesia, and Bank Negara.

CHART 4
DEPOSIT RATE SPREADS

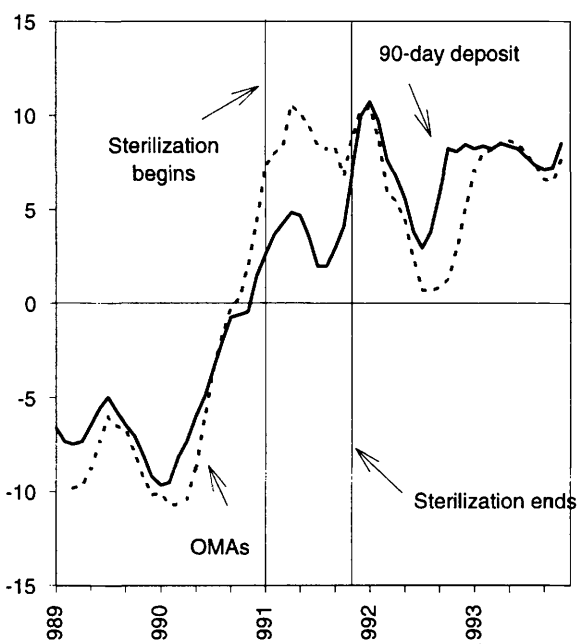
Argentina, 1991:1-1994:10



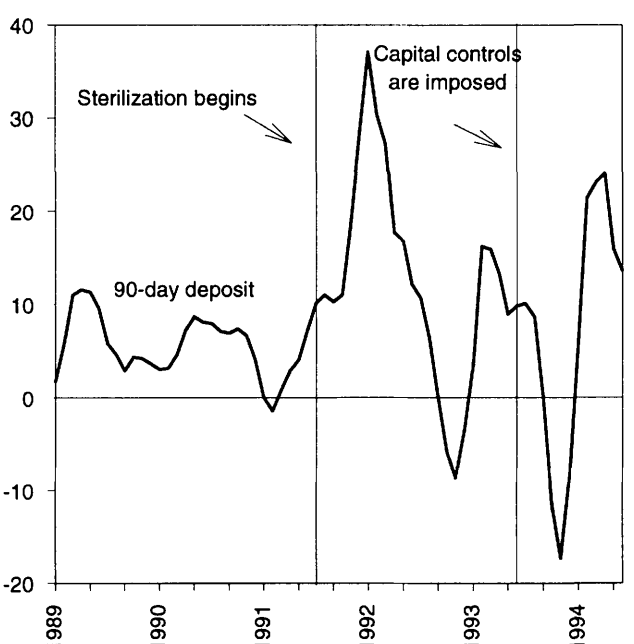
Chile, 1989:1-1994:7



Colombia, 1989:1-1993:11



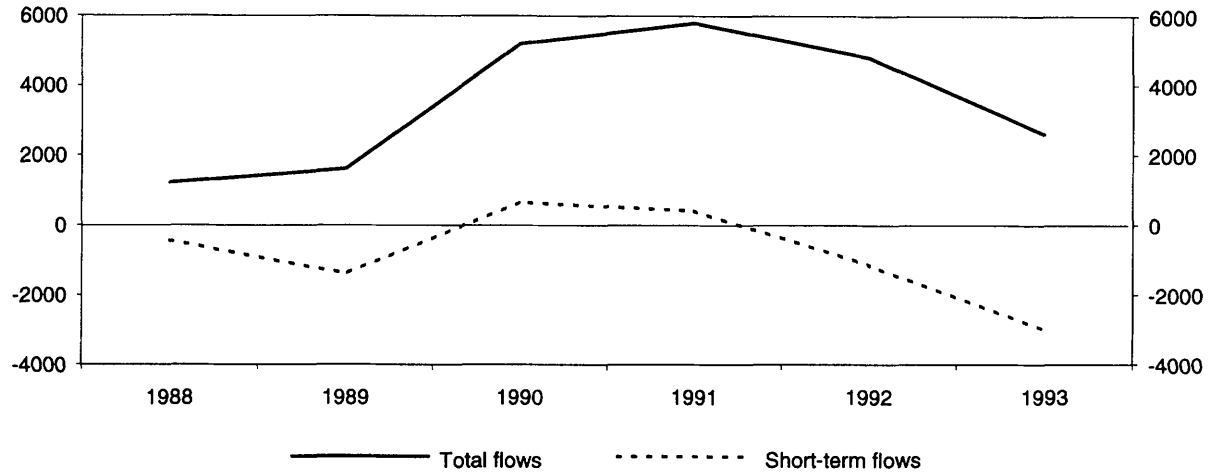
Malaysia, 1989:1-1994:7



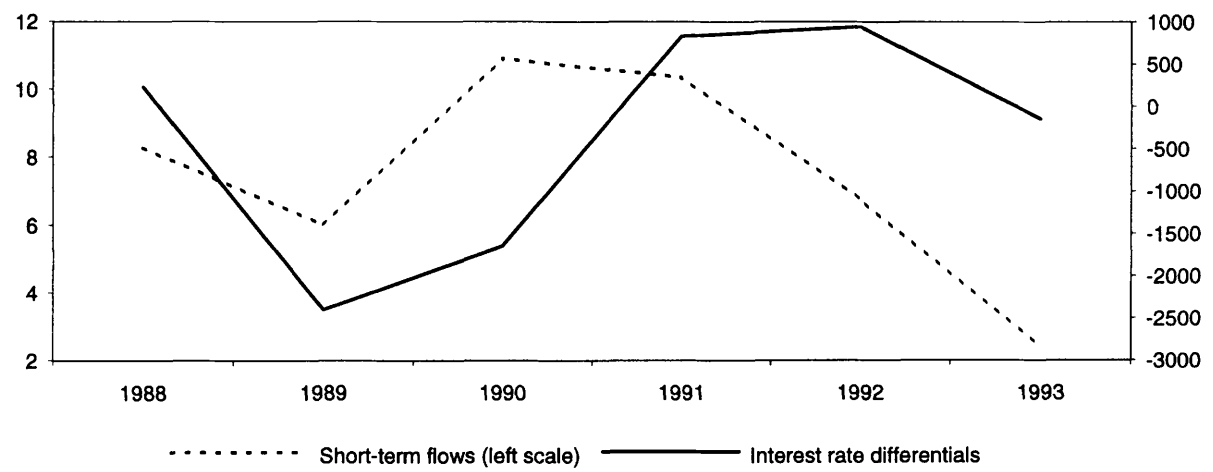
Sources: International Financial Statistics, IMF, Reuters, and various central bank bulletins.
Note: The spread is defined as the domestic interest rates converted into dollars minus the dollar LIBOR rate of comparable maturity.

CHART 5
INDONESIA: CAPITAL FLOWS AND INTEREST RATE DIFFERENTIALS

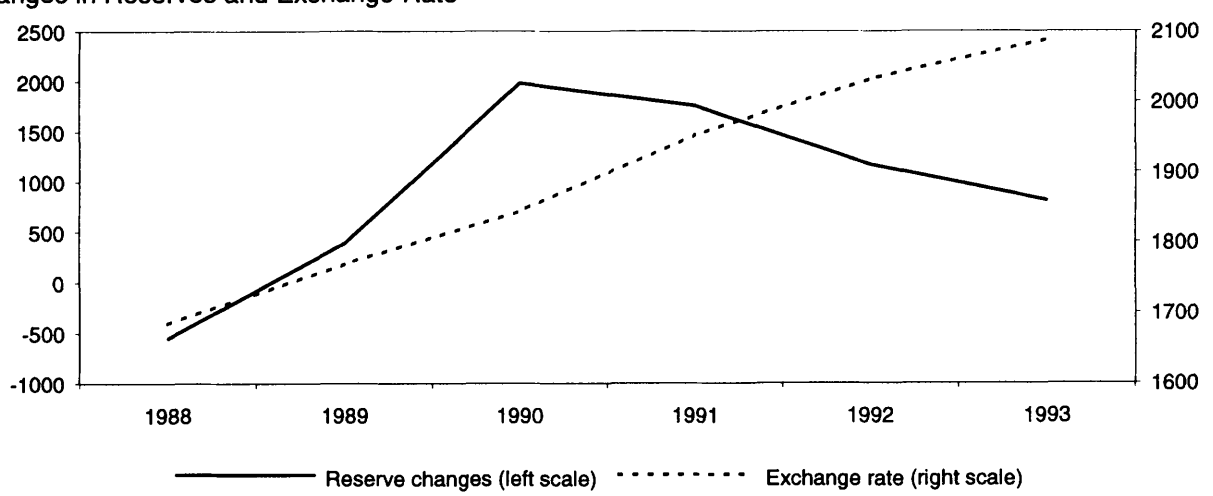
Net Capital Flows [1)]



Interest Rate Differentials [2)] and Short-Term Capital Flows



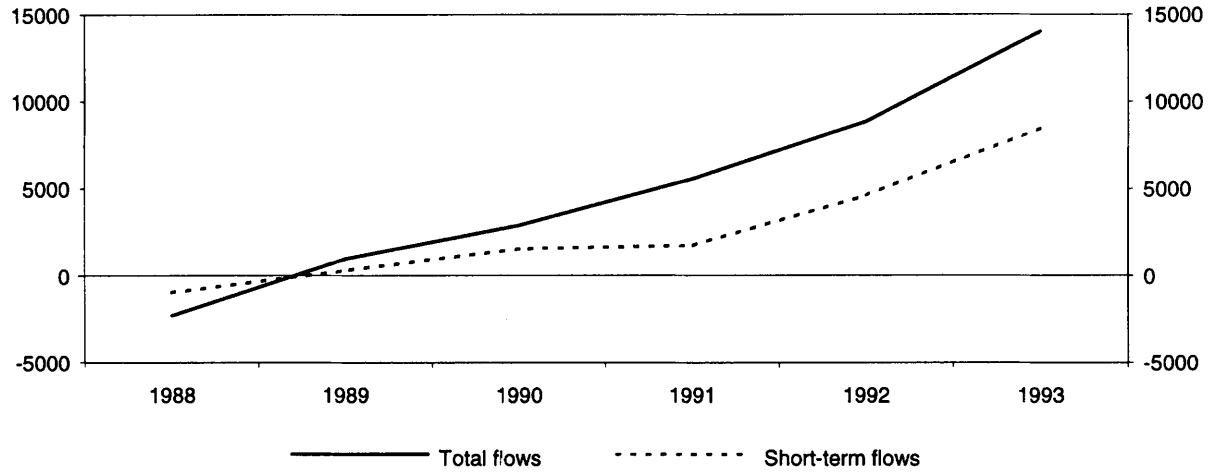
Changes in Reserves and Exchange Rate [3) 4)]



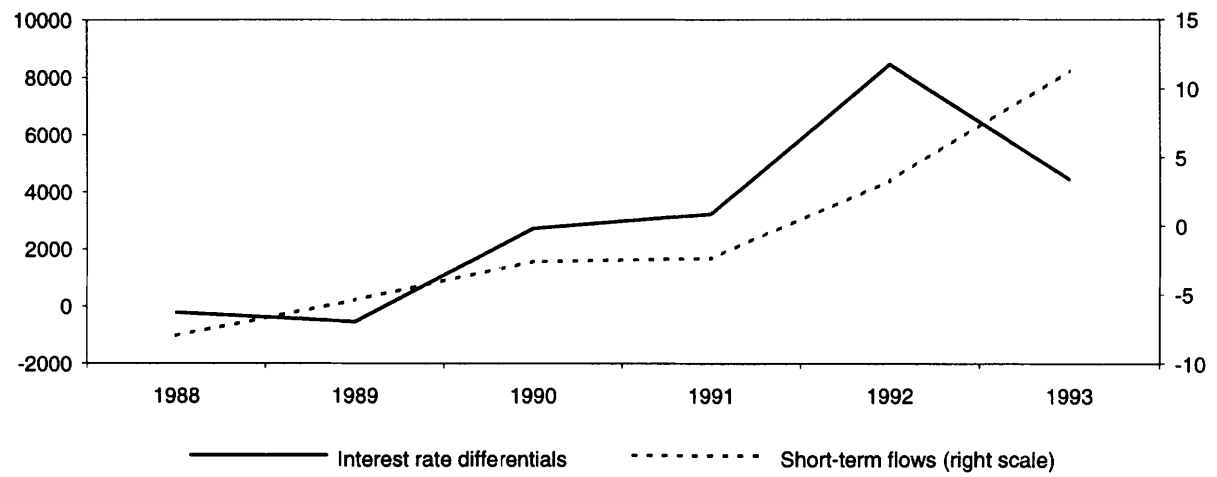
Sources: Balance of Payments Yearbook; and IFS.
1) In millions of U.S. dollars. Short-term capital flows include net errors and omissions.
2) Measured as deposit rates adjusted for exchange rate changes minus 3-month U.S. treasury rate.
3) Reserves are in millions of U.S. dollars.
4) The exchange rate is vis-a-vis U.S. dollar.

CHART 6
MALAYSIA: CAPITAL FLOWS AND INTEREST RATE DIFFERENTIALS

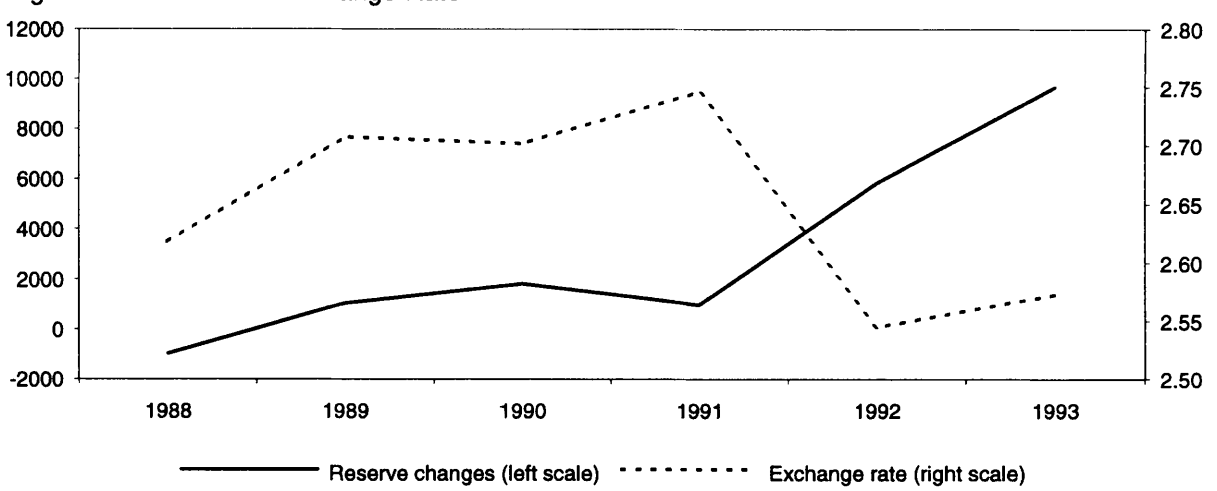
Net Capital Flows [1]



Interest Rate Differentials [2] and Short-Term Capital Flows



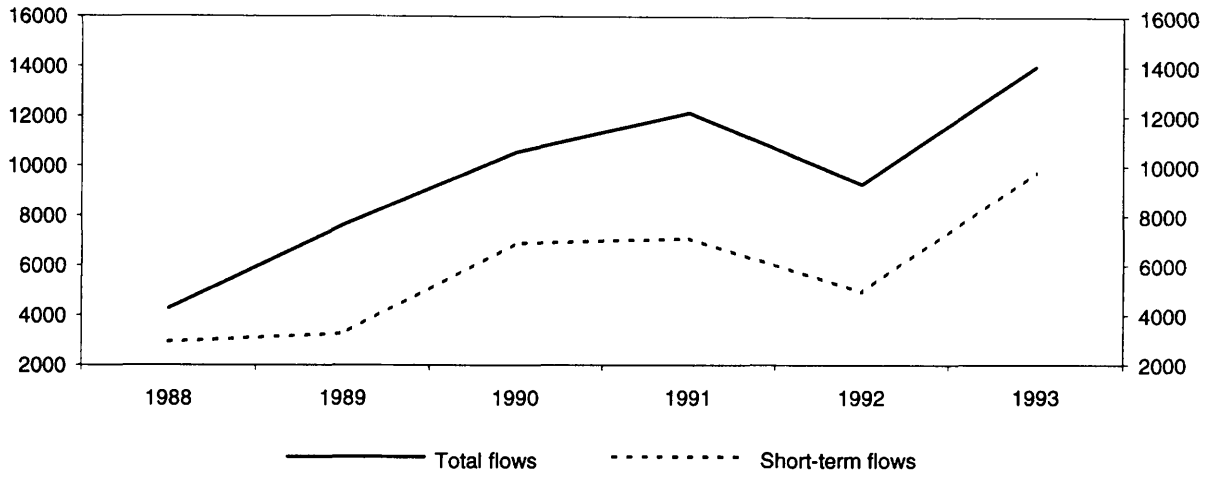
Changes in Reserves and Exchange Rate [3] [4]



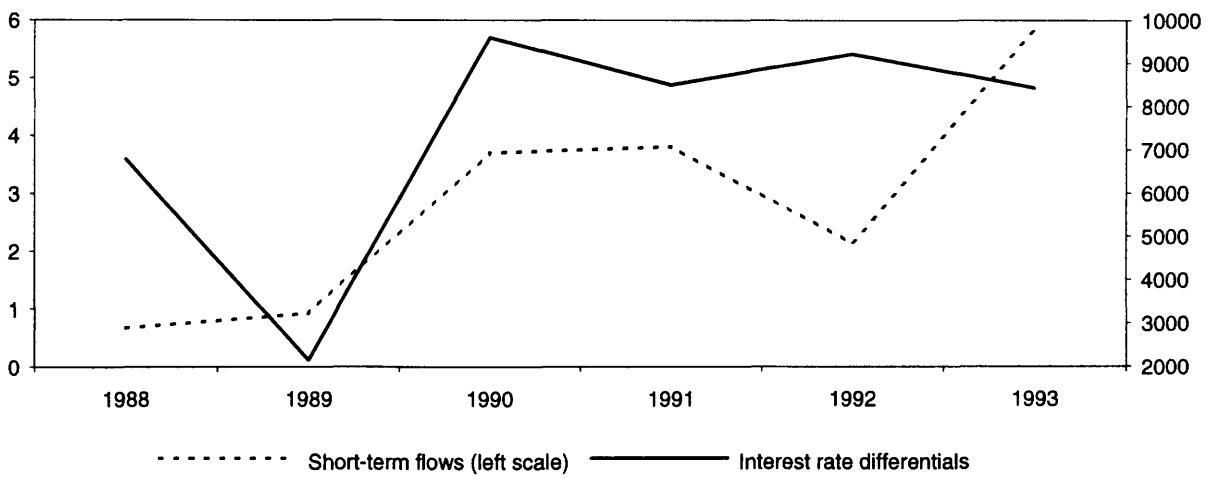
Sources: Balance of Payments Yearbook; and IFS.
1) In millions of U.S. dollars. Short-term capital flows include net errors and omissions.
2) Measured as deposit rates adjusted for exchange rate changes minus 3-month U.S. treasury rate.
3) Reserves are in millions of U.S. dollars.
4) The exchange rate is vis-a-vis U.S. dollar.

CHART 7
THAILAND: CAPITAL FLOWS AND INTEREST RATE DIFFERENTIALS

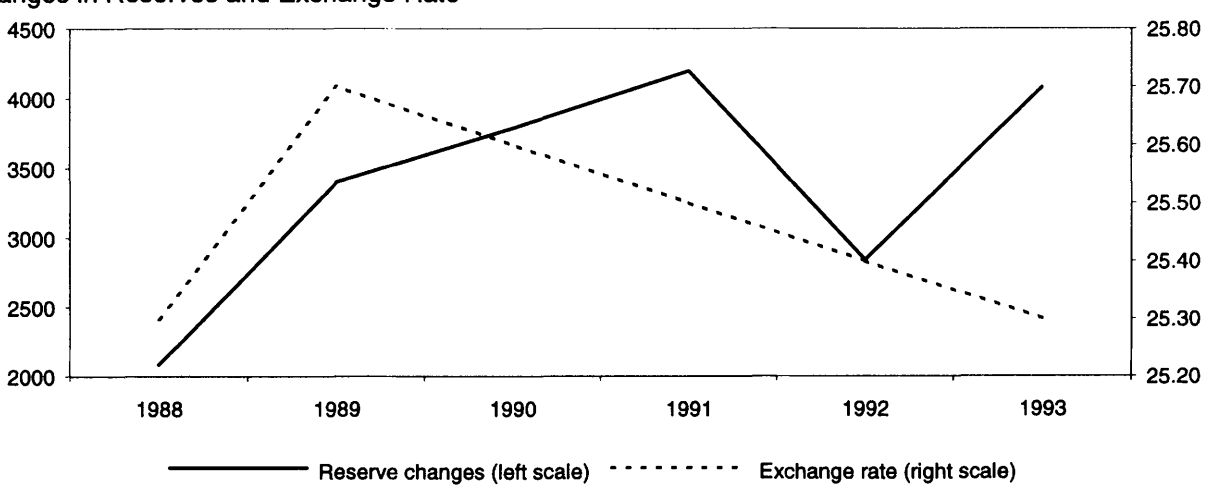
Net Capital Flows [1]



Interest Rate Differentials [2] and Short-Term Capital Flows



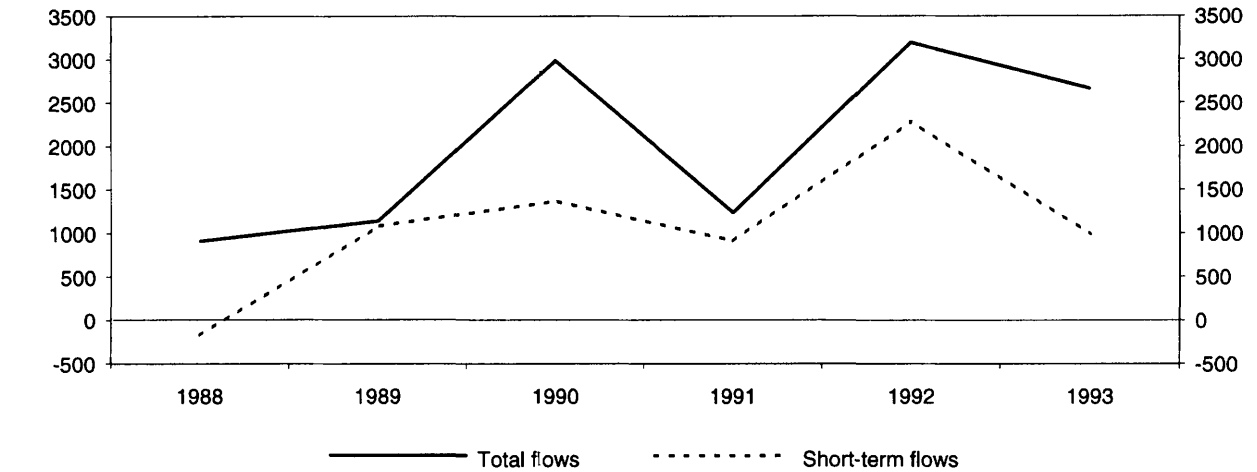
Changes in Reserves and Exchange Rate [3] [4]



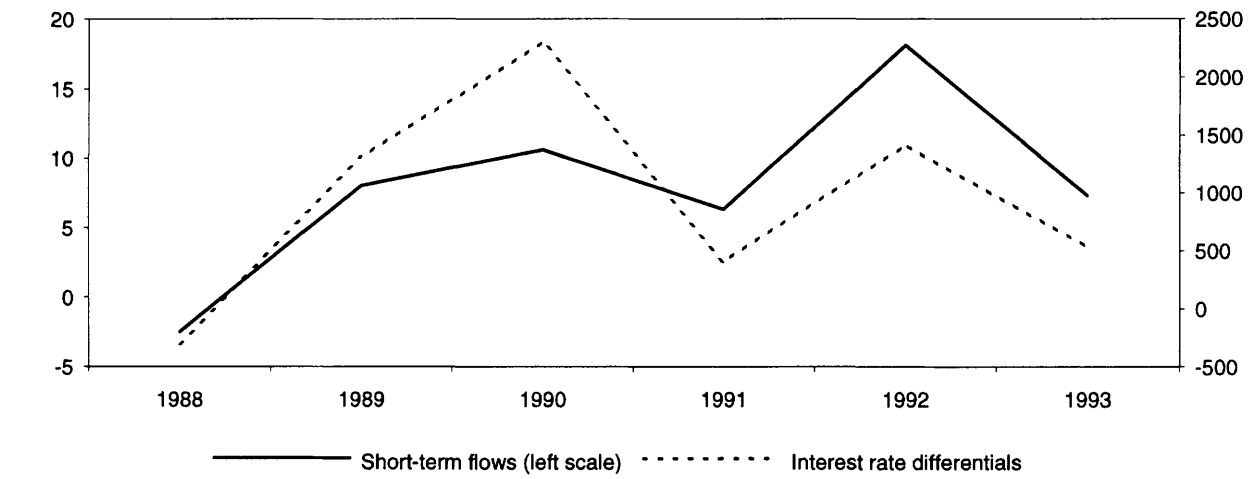
Sources: Balance of Payments Yearbook; and IFS.
1) In millions of U.S. dollars. Short-term capital flows include net errors and omissions.
2) Measured as deposit rates adjusted for exchange rate changes minus 3-month U.S. treasury rate.
3) Reserves are in millions of U.S. dollars.
4) The exchange rate is vis-a-vis U.S. dollar.

CHART 8
CHILE: CAPITAL FLOWS AND INTEREST RATE DIFFERENTIALS

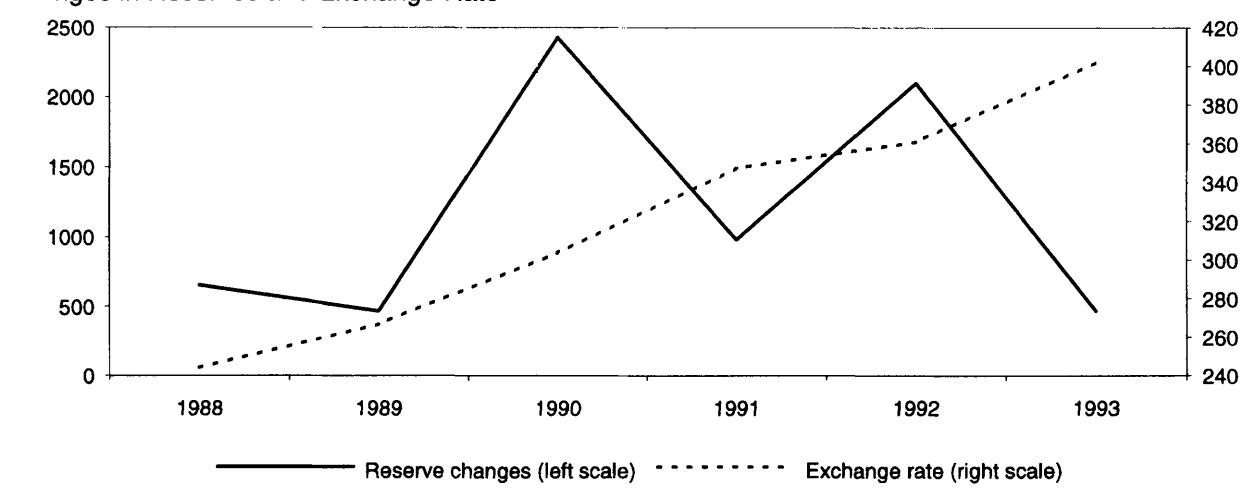
Net Capital Flows [1]



Interest Rate Differentials [2] and Short-Term Capital Flows



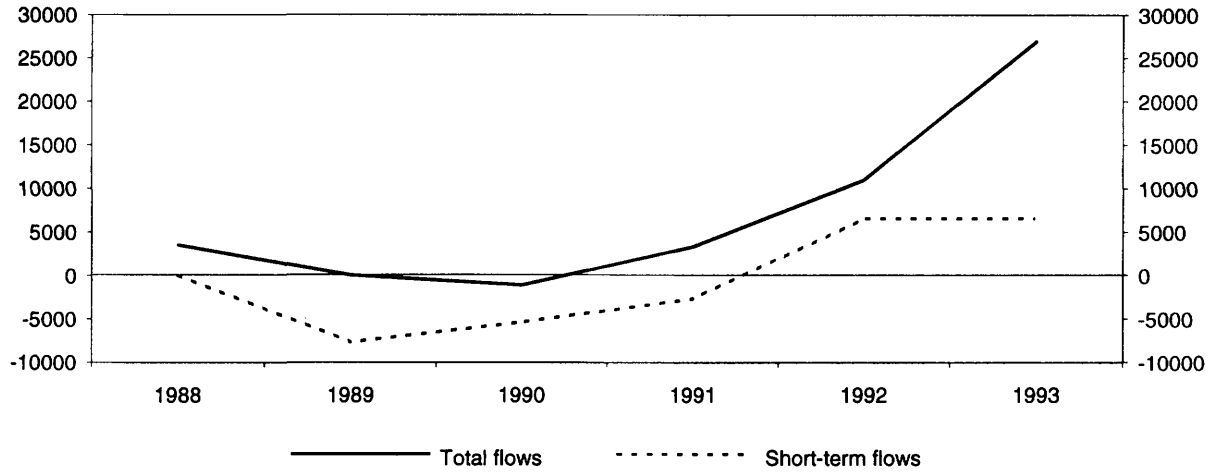
Changes in Reserves and Exchange Rate [3] [4]



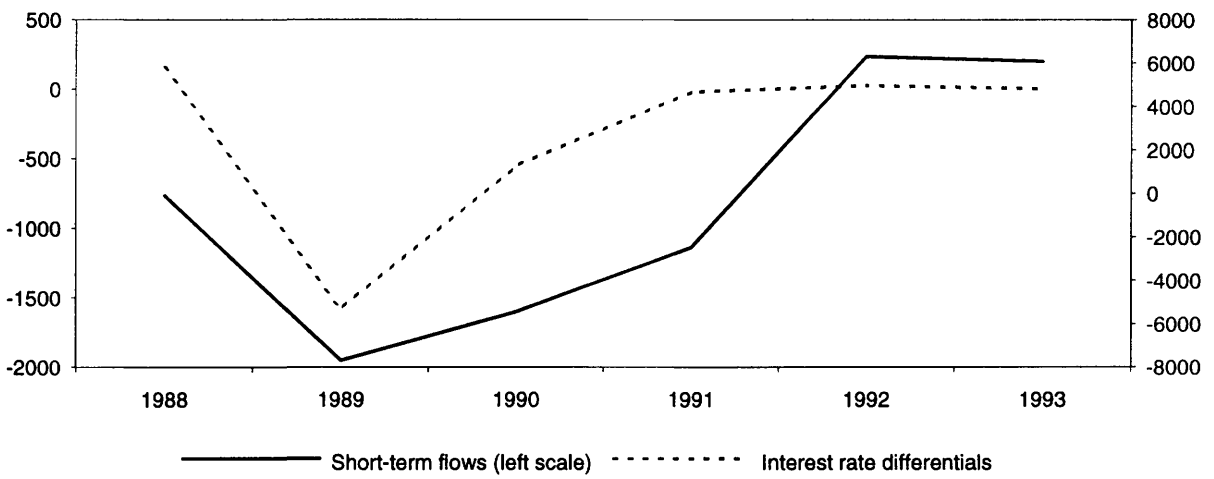
Sources: Balance of Payments Yearbook; and IFS.
1) In millions of U.S. dollars. Short-term capital flows include net errors and omissions.
2) Measured as deposit rates adjusted for exchange rate changes minus 3-month U.S. treasury rate.
3) Reserves are in millions of U.S. dollars.
4) The exchange rate is vis-a-vis U.S. dollar.

CHART 9
ARGENTINA: CAPITAL FLOWS AND INTEREST RATE DIFFERENTIALS

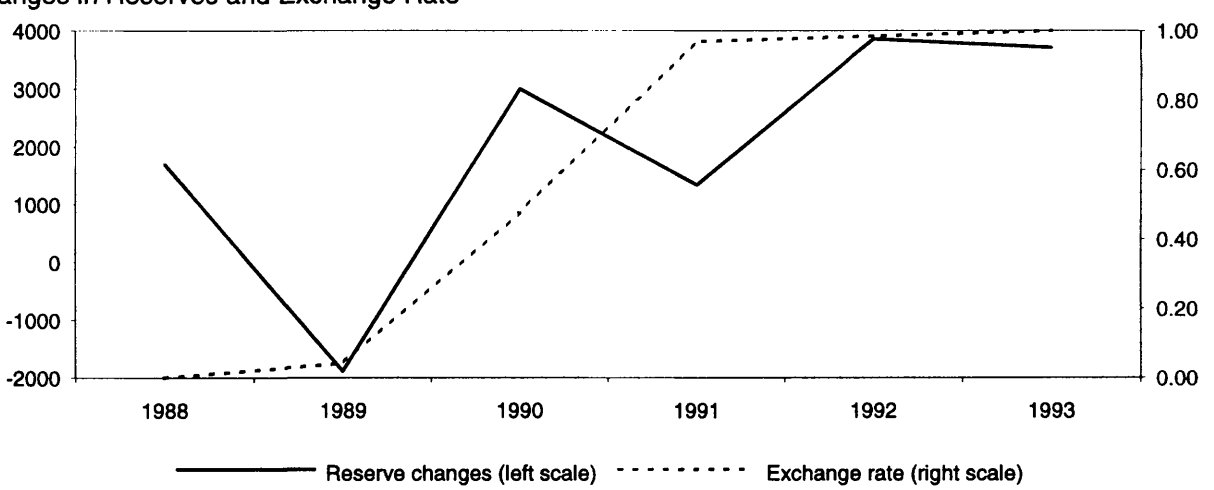
Net Capital Flows [1]



Interest Rate Differentials [2] and Short-Term Capital Flows



Changes in Reserves and Exchange Rate [3] [4]



Sources: Balance of Payments Yearbook; and IFS.
1) In millions of U.S. dollars. Short-term capital flows include net errors and omissions.
2) Measured as deposit rates adjusted for exchange rate changes minus 3-month U.S. treasury rate.
3) Reserves are in millions of U.S. dollars.
4) The exchange rate is vis-a-vis U.S. dollar.

REFERENCES

Alfiler, F. Enrico, 1994, 'Monetary and Exchange Rate Policy Responses to Surges in Capital Flows: The Case of the Philippines,' paper prepared for the Eleventh Pacific Basin Central Bank Conference held in Hong Kong, October 31-November 2, 1994.

Aziz, Zeti Akhtar, 1994, 'Capital Flows and Monetary Management: The Malaysian Experience,' paper prepared for the Eleventh Pacific Basin Central Bank Conference held in Hong Kong, October 31-November 2, 1994.

Bacchetta, Philippe, and Eric Van Wincoop, 1994, 'Net Capital Flows Under Exchange Rate and Price Volatility,' Studienzentrum Gerzensee Working Paper No. 94/03.

Banco Central de Chile, *Memoria Anual*, various issues.

Banco Central de Chile, *Evolucion de la Economia*, various issues.

Banco de la República, Colombia, *Annual Report*, various issues.

Bank Negara Malaysia, *Annual Report*, various issues.

Banco de Mexico, 1993, *Informe Anual.*

Bercuson, Kenneth, and Linda Koenig, 1993, *The Recent Surge in Capital Inflows to Asia: Cause and Macroeconomic Impact*, Occasional Paper No. 15, (Kuala Lumpur, Malaysia: South East Asian Central Banks).

Budnevich, Carlos, and Rodrigo Cifuentes, 1993, 'Manejo Macroeconomico de los Flujos de Capitales: La Contrastante Experiencia de Chile,' paper presented at the CIEPLAN conference on capital flows held in Cartagena, Colombia, July 29-30, 1993.

Calvo, Guillermo, 1991, 'The Perils of Sterilization,' *IMF Staff Papers* 38, December, 921-6.

Calvo, Guillermo, Leonardo Leiderman, and Carmen M. Reinhart, 1993, 'Capital Inflows to Latin America: The Role of External Factors,' *IMF Staff Papers*, 40 March, 108-51.

Calvo, Guillermo, Leonardo Leiderman, and Carmen M. Reinhart, 1994, 'The Capital Inflows Problem: Concepts and Issues,' *Contemporary Economic Policy* 12, July, 54-66.

Carrasquilla, Alberto, 1995, 'Exchange Rate Bands and Shifts in the Stabilization Policy Regime: Issues Suggested by the Experience of Colombia,' IMF Working Paper WP/95/42, (Washington: International Monetary Fund, April).

Coorey, Sharmini, 1992, 'Financial Liberalization and Reform in Mexico,' in *Mexico: The Strategy to Achieve Sustained Economic Growth*, Claudio Loser (ed.), IMF Occasional Paper 99, (Washington: International Monetary Fund).

Dominguez, Kathryn M., and Jeffrey A. Frankel, 'Does Foreign Exchange Intervention Matter? The Portfolio Effect,' forthcoming in *American Economic Review.*

Eichengreen, Barry, 1991, 'Trends and Cycles in Foreign Lending,' in *Capital Flows in the World Economy*, Horst Siebert, ed., (Tübingen: Mohr), 3-28.

Folkerts-Landau, David, Garry J. Schinasi, Marcel Cassard, Victor K. Ng, Carmen M. Reinhart, and Michael G. Spencer, 1995, 'Effect of Capital Flows on Domestic Financial Sectors in APEC Developing Countries,' in M S. Khan and C.M. Reinhart (eds.), *Capital Flows in the APEC Region*, IMF Occasional Paper 122, (Washington, D.C.: International Monetary Fund).

Frankel, Jeffrey A., 1994a, 'Have Latin American and Asian Countries So Liberalized Portfolio Capital Inflows That Sterilization is Now Impossible,' mimeo, Institute for International Economics.

Frankel, Jeffrey A., 1994b, 'Sterilization of Money Inflows: Difficult (Calvo) or Easy (Reisen)?,' IMF Working Paper WP/94/159.

Grobar, Lisa M., 1993, 'The Effect of Real Exchange Rate Uncertainty on LDC Manufactured Exports,' *Journal of Development Economics* 41, 367-76.

Gurria, Jose Angel, 1993, 'Capital Flows: The Mexican Case,' paper prepared for the ECLAC-IDRC workshop, 'New Private Flows into Latin America' held in Santiago, Chile, December 6-7, 1993.

Harinowo, C., and William C. Belchere, 1994, 'Monetary and Exchange Rate Management with International Capital Mobility: The Indonesian Experience,' paper prepared for the Eleventh Pacific Basin Central Bank Conference held in Hong Kong, October 31-November 2, 1994.

Helpman, Elhanan, Leonardo Leiderman, and Gil Bufman, 1995, 'A New Breed of Exchange Rate Bands: Chile, Israel, and Mexico,' *Economic Policy: A European Forum*, Vol. 9, 260-306.

Hettiarachchi, W., and U. Herat, 1994, 'Coping with Capital Inflows - the Case of Sri Lanka,' paper prepared for the Eleventh Pacific Basin Central Bank Conference held in Hong Kong, October 31-November 2, 1994.

Kang, Joong-Hong, 1992, 'Monetary Policy Implementation under Financial Liberalisation: The Case of Korea,' in H. Reisen and B. Fischer (eds.), *Financial Opening: Policy Issues and Country Experiences in Developing Countries*, (Paris: OECD), 201-25.

Kang, Joong-Hong, 1994, 'Monetary and Exchange Rate Policies in a Newly Industrializing Economy: The Korean Experience,' paper prepared for the Eleventh Pacific Basin Central Bank Conference held in Hong Kong, October 31-November 2, 1994.

Kiguel, Miguel, and Leonardo Leiderman, 1994, 'On the Consequences of Sterilized Intervention in Latin America: The Case of Colombia and Chile,' (mimeograph, Tel Aviv: Tel Aviv University).

Krugman, Paul, 1987, 'The Narrow Moving Band, the Dutch Disease, and the Competitive Consequences of Mrs. Thatcher: Notes on Trade in the Presence os Scale Economies,' *Journal of Development Economics*, Vol. 27, 41-55.

Labán, Rául, and Felipe Larraín, 1994, 'Can a Liberalization of Capital Outflows Increase Net Capital Inflows?', (mimeograph, Santiago Chile: Pontificia Universidad Católica de Chile, January).

Laporan Mingguan Weekly Report, various issues.

Montiel, Peter J., 1996, 'Managing Economic Policy in the Face of Large Capital Inflows: What Have We Learned,' forthcoming in *Private Capital Flows to Emerging Markets After the Mexican Crisis*, G. Galvo, M. Goldstein, and E. Hochreiter, eds., (Washington: Institute for International Economics).

Mussa, Michael L., 1981, 'The Role of Intervention,' Occasional Paper No. 6, (New York: Group of Thirty).

Nijathaworn, Bandid, and Thanisorn Dejthamrong, 1994, 'Thailand: Monetary and Exchange Rate Management with International Capital Mobility,' paper prepared for the Eleventh Pacific Basin Central Bank Conference held in Hong Kong, October 31-November 2, 1994.

Obstfeld, Maurice, 1990, 'The Effectiveness of Foreign Exchange Intervention: Recent Experience,' in W. Branson, J. Frenkel, and M. Goldstein (eds.), *International Policy Coordination and Exchange Rate Determination*, (Chicago: University of Chicago Press).

Porter, Michael G., 1972, 'Capital Inflows as an Offset to Monetary Policy: The German Experience,' *Staff Papers* 19, 395-419.

Reinhart, Carmen M., and Vincent R. Reinhart, 1995, 'On the Use of Reserve Requirements to Deal with the Capital Flow Problem,' University of Maryland Working Papers in International Economics No. 16.

Reinhart, Carmen M., and R. Todd Smith, 'Capital Controls: Concepts and Experiences,' forthcoming IMF Working Paper.

Reisen, Helmut, 1993, 'The "Impossible Trinity" in Southeast Asia,' *International Economic Insights*, March/April.

Rodriguez, Carlos A., 1991, 'Situación Monetaria y Cambiaria en Colombia', (mimeograph, Buenos Aires, Argentina: CEMA, November).

Schadler, Susan, Maria Carkovic, Adam Bennett, and Robert Khan, 1993, *Recent Experiences with Surges in Capital Inflows*, IMF Occasional Paper 108, (Washington D.C.: International Monetary Fund).

Taylor, Mark P., 1995, 'Exchange Rate Behavior,' *Journal of Economic Literature*, Vol. 33, 13-47.