CAPITAL FLIGHT: ESTIMATES, ISSUES, AND EXPLANATIONS

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Abstract

Large-scale capital flight is often mentioned as an important cause of the external debt problems of developing countries. Motivated by this concern, this paper addresses the following questions (1) What is capital flight and, empirically, how large is it? (2) Why is capital flight thought of as "bad", i.e., as a reason for policy concern? (3) What are the underlying economic determinants of capital flight? and (4) What policy reforms, if any, are appropriate for stemming capital flight?
ACKNOWLEDGMENTS

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1. INTRODUCTION

Large-scale capital flight is often mentioned as a prime contributing factor to the external debt problem of developing countries (see, e.g., Díaz-Alejandro (1984), Dooley, et. al (1986), Dornbusch (1985), Harberger (1985)). The term "capital flight" is laden with negative connotations and inevitably evokes suggestions for policy reform or short-run expedients such as capital controls. For example, the 1984 Annual Report of the BIS claims, "The external position in Latin America appears to have been severely aggravated by private-sector capital outflows." (p. 101). Commenting on this report, the Economist (June 23, 1984) concluded, "The institution's [BIS'] careful prose implies that if the rich of Latin America brought home what they earned on their funk money their countries would not be in such a mess."

Motivated by growing awareness of the capital flight phenomenon, this paper addresses the following questions:

- What is "capital flight" and, empirically, how large is it?
- Why is capital flight thought of as "bad"?
- What are the underlying as well as proximate causes of capital flight?
- What policy reforms, if any, are appropriate for stemming capital flight?
Is there any indication that capital controls, i.e. regulations or legal prohibitions on capital outflows can, in fact, choke off capital flight?

Chapter 2 of the paper first provides estimates on the importance of capital flight for eight heavily indebted developing countries over the period 1974-82. These estimates are compared to the countries' growth in external indebtedness to get some idea of the relative magnitudes involved. Chapter 3 suggests a number of reasons why the presence of capital flight may be a policy concern. The relative importance of various economic determinants of capital flight in the countries studied is examined in Chapter 4. In light of this analysis, Chapter 5 considers the efficacy of capital controls. Chapter 6 concludes by stressing the importance of stable macroeconomic and financial policies if massive capital flight is to be prevented.
2. ESTIMATING CAPITAL FLIGHT

When discussing capital flight, one must decide how broadly or narrowly to define the concept. Presumably, capital flight cannot exceed the gross total of foreign assets held by domestic residents. But any such number is bound to be too large, because some claims on foreigners represent ordinary business activity ranging from direct investment to normal levels of commercial export credit. Furthermore, some claims on foreigners are probably held as "cover" for liabilities to foreigners.

The term capital flight typically refers to short-term "speculative" capital outflows. It involves "hot money" that responds to political or financial crises, the tightening of capital controls or heavier taxes, the fear of major devaluations of the domestic currency, or (actual or incipient) hyperinflation. In addition to shifts in domestic portfolio composition towards foreign liquid assets, short-term capital flight may take the form of changes in trade credit. In the face of large international interest rate differentials or imminent devaluation, for example, domestic firms will slash their trade credit denominated in foreign currency. At the same time, they may show increased willingness to provide foreigners with trade credit denominated in foreign currency. This is, in fact, just one of a number of mechanisms for expediting the export of short-term capital. When it becomes excessive, it seems reasonable to label it "capital flight."

Other more ingenious methods for exporting capital abound, particularly in countries with regulations prohibiting the legal transfer of funds abroad. Recent reports in the popular press of the plundering of the
Philippines by the Marcos family provide examples of how capital flight is effected and the many types of foreign assets into which capital may flee.

When the narrow "hot money" definition is used, capital flight typically refers to capital export by the private non-bank sector, although in some cases banks and official entities may also engage in it. Some authors define capital flight more broadly as the gross value of all capital exports from an economy, regardless of whether they reflect the purchase of foreign financial assets, real assets (such as real estate), or direct foreign investment by domestic residents. Some would even consider the massive emigration of highly trained professionals who fear financial or political collapse at home to be a form of capital flight, namely human capital flight. The appropriate definition, of course, depends on the questions one wishes to address. In what follows, the term "capital flight" is reserved for short-term speculative capital outflows, while "gross capital outflows" will be referred to as such.

Regardless of how broadly or narrowly one defines capital flight, assessing its quantitative importance is difficult. This is true even in countries that impose no restrictions on capital outflows, because of the imprecision with which financial transactions are often reported in countries' balance of payments. And the measurement problems become more severe in countries with capital controls. Typically, only the amount of capital flight net of any unrecorded capital inflows, not the gross capital outflow, is estimable. The major
evidence of capital flight is often in the "errors and omissions" item of the balance of payments accounts.

Some forms of capital flight, such as that effected through smuggling or the underinvoicing of exports and overinvoicing of imports, do not even show up in "errors and omissions". As long as the foreign-currency receipts from smuggled goods are kept abroad and cannot be observed by domestic authorities, neither the outflow of goods nor the corresponding change in domestic holdings of assets abroad will be recorded in the balance of payments. This is also true for exports and imports with faked invoices. Only the faked amount on the invoice shows up in the balance of payments accounts. The difference between the faked amount and the true amount of the contract is recorded neither in the trade accounts nor in financial flows or errors and omissions.

It is possible to estimate capital flight effected by the underinvoicing of exports and overinvoicing of imports using partner-country trade data comparisons, as implemented by Bhagwati, Krueger, and Wibulswasdi (1974). Using our present methods, such capital flight escapes detection. Hence our estimates of capital flight are probably on the low side, particularly for countries that have highly-distorted trade systems. The recent study by Gulati (1985) uses partner-country trade data comparisons to estimate capital flight. His estimates for capital flight effected by the underinvoicing of exports are reported in Appendix B. Parenthetically, Gulati notes that using his methodology, the definition of capital flight should be limited to illegal capital outflows.
Despite these conceptual and measurement problems, some rough estimates of net capital flight are possible. We analyzed the capital accounts of the balance of payments for eight heavily indebted countries: Argentina, Brazil, Chile, Korea, Mexico, Peru, Uruguay, and Venezuela. In each case the errors and omissions category was included in the measure of capital flight, because of the widespread belief that errors and omissions reflect, in large part, unrecorded short-term capital flows. In addition, certain sub-categories of the line item "other short-term capital, other sector" (i.e. excluding the official sector and money banks) were included. A judgment on what to include in capital flight had to be made on a country by country basis using the descriptive footnotes from the IMF's Balance of Payments Yearbook. The objective was to isolate short-term capital movements that might reasonably be considered "capital flight." The exact definition of capital flight for each country is given in Table 1.

Table 1 provides estimates of capital flight for each of the countries considered. To get some indication of its relative importance in each year from 1974 through 1982, our measure of capital flight is compared to the country's growth in external debt in the same year. $^1$ Two things are particularly noteworthy in the Table. First, the importance of capital flight varies tremendously from country to country with Argentina, Venezuela, and Mexico exhibiting large amounts of capital flight over the period. In Brazil, Chile, Peru, and Korea, on the other hand, the aggregate amount of capital flight is insignificant. Second, the severity of capital flight in some countries varied considerably.
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NOTE 1: Change in external debt figures are from Dooley et. al. (1986) except in the case of Uruguay where the change in external debt is obtained from by cumulating relevant capital inflows using the Balance of Payments Yearbook.

NOTE 2: As described in the text, the capital flight estimates are calculated in slightly different ways across countries, depending on the information contained in the descriptive footnotes in the Balance of Payment Yearbook.

The precise definitions are the following:
Argentina: net errors and omissions plus "short term, other sectors".
Brazil: net errors and omissions.
Chile: net errors and omissions plus "short term, other sectors".
Korea: net errors and omissions plus "short term, other sectors".
Mexico: net errors and omissions plus "short term, other sectors, other assets".
Peru: net errors and omissions plus "short term, other sectors, other assets".
Uruguay: net errors and omissions.
Venezuela: net errors and omissions plus "short term, other sectors" plus "other bonds:assets".
From year to year, as the experiences of Uruguay and Peru illustrate. Although cumulative capital flight from Uruguay is moderately large, it is insignificant for Peru in spite of the 1974-76 period where capital flight occurred on a large scale. Even if its total contribution to Peru's external debt has been rather small, capital flight may, at times, have had a significant effect on the authorities' ability to carry out macroeconomic policy. A third feature to note in the Table is that capital flight seems to have become relatively more important in the late 1970s and early 1980s than it was in the early 1970s.

The capital flight estimates in Table 1 can be compared to the broader measure of capital outflows derived by Dooley, Helkie, Tryon and Underwood (1986), reported in Table 2. Their estimates are obtained by taking reported changes in external indebtedness from Federal Reserve Board records on the stock of external debt for individual LDCs, which are based (to varying degrees) on both debtor and creditor reporting systems, and decomposing them into three sources: (i) the current account deficit less the part financed by direct foreign investment (i.e., non-debt-creating inflows), (ii) the change in total official reserve assets less gold, plus the net change in foreign assets of commercial banks, \(^2\) and (iii) a residual. Items (i) and (ii) are obtained from the balance of payments statistics. The residual obtained when these two items are subtracted from the change in external debt is treated as the capital outflow of the non-bank private sector; \(^3\) hence the title "residual capital outflows" for Table 2. \(^4\) In Dooley et al., (1986) and earlier drafts of the present paper, the term "gross capital outflows" was used. Because the figures calculated by Dooley et. al.,
are sometimes positive and sometimes negative, they cannot possibly be gross outflows. Being a residual, the figures reflect the net amount of all capital outflow and inflows not explicitly accounted for in arriving at the residual. The same comment of course applies to the capital flight estimates in Table 1. They, too, are a residual to the extent that they use the errors and omissions item (as well as other line items) from the balance of payments accounts. Hence, they reflect capital flight net of any unrecorded capital inflows. In some years, e.g., when incentives for capital flight are reversed, the latter may dominate, causing the figures in Tables 1 and 2 to become negative.

The residual capital outflow estimates in Table 2 differ from the capital flight estimates in Table 1 for three reasons. First, the residual capital outflows include long-term as well as short-term outflows. Second, they include outflows by deposit banks and the official sector (excluding changes in foreign exchange reserves), in addition to the non-bank private sector. The capital flight numbers in Table 1, in principle, include only short-term outflows of the non-bank private sector, although, in practice, part of errors and omissions undoubtedly reflects long-term capital outflows. Third, the increase in stock of external debt reported by Dooley et. al. (1986) is sometimes quite different than the debt-creating capital inflows recorded in the balance of payments statistics. The residual capital outflows in Table 2 are calculated using the stock figures on external debt. The
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**TABLE 2:** RESIDUAL CAPITAL OUTFLOWS
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**SOURCE:** These figures are derived from the tables in Dooley et. al. (1986). The underlying external debt data came from the Federal Reserve files. Gross private capital flows are calculated as a residual, as described in the text.
capital flight estimates in Table 1 implicitly use the debt creating flows measured in the balance of payments accounts, because these data are used in arriving at "errors and omissions".

The difference between the stock of debt and the cumulative flow of foreign borrowing is due to such things as: (i) reporting inaccuracy, (ii) minor valuation changes (which show up in the "stock" numbers, but not in the cumulative flows) and (iii) the possibility of inappropriately netting certain inflows and outflows when relying on balance of payments reports. As Dooley (1986) shows, the two methods for calculating a country's external debt yield similar estimates in some cases (i.e. Brazil), while in others (i.e. Argentina) the total stock of external debt is considerably larger than that implied by the cumulative debt-creating inflows in the balance of payments statistics. Unrecorded military expenditure financed by external borrowing is said to be an important contributor to the discrepancy in the Argentinian case.
3. WHY IS CAPITAL FLIGHT "BAD"?

Sao Paulo economist Stephen Charles Kanitz (1984) recently asked: "Why is it that when an American puts money abroad it is called 'Foreign Investment' and when an Argentinian does the same it is called 'Capital Flight'? Why is it when an American company puts 30 percent of its equity abroad it is called 'Strategic Diversification' and when a Bolivian businessman puts only 4 percent abroad it is called 'Lack of Confidence'?"

There is, of course, no reason why the simultaneous export and import of capital is necessarily undesirable. On the contrary, the simultaneous inflow and outflow may reflect the same legitimate objective pursued by both domestic and foreign residents to diversify portfolios internationally. The fact that gross capital flows greatly exceed net flows may be an indication of a high degree of financial integration with world capital markets and the availability of opportunities for risk sharing. Similarly, long-term capital inflows offset by short-term capital outflows may reflect the activity of financial intermediaries engaged in maturity transformation at the international level. One might expect to see this, for example, when examining capital flows between Canada and the United States. Canadian firms may borrow competitively-priced long-term funds in the United States capital market at the same time that other Canadians elect to hold deposits at U.S. banks. This argument was often used in the late 1960s and early 1970s to explain capital flows between the U.S. and Europe. The U.S. was considered "the world's banker". 
The foregoing remarks suggest that capital outflows or, more precisely, simultaneous capital inflows and outflows are not necessarily a "problem" even for developing countries, let alone for financially-sophisticated industrial countries. Why then is capital flight thought of as "bad", i.e., as \textit{prima facie} evidence that some sort of policy intervention is needed? There are several possible answers:

3.1 \textbf{Capital Flight Destabilizes Interest Rates and Exchange Rates and Reduces Monetary Control}

The usual objection to speculative capital flows is that they are destabilizing. This point is often made when discussing "hot money" flows among the world's financial centers, but it is also relevant for countries with less developed financial systems. When there is political or financial instability or major changes in macroeconomic policy are anticipated, mobile capital will be moved quickly from the risky country to a "safe haven." These movements induce large and rapid adjustments in interest rates and exchange rates, perhaps with considerable exchange rate "overshooting." Counterproductive contractions in the domestic money supply and exhaustion of foreign exchange reserves may also occur if the central bank intervenes in an attempt to stabilize the exchange rate.

In making a case that capital flight is "bad" and should, therefore, be controlled by "appropriate" policy action, interventionists presume that the above-mentioned consequences of capital flight inflict welfare losses on the economy as a whole. Not only will capital flight exacerbate existing economic distortions in the
short run, it may also have long-run implications, several of which are discussed below.

It should be emphasized that the above discussion presumes that capital flight is caused by factors beyond the policymaker's control. In many cases, however, capital flight is a direct private-sector response to ill-conceived or poorly executed domestic policies. It would be more appropriate to label the contentious policies rather than capital flight as "bad" in such circumstances.

It is difficult to assess the welfare implications of capital flight caused by inflationary macroeconomic policies, political instability, or a lack of confidence. Were it not for the threat of capital flight, governments might be more tempted to adopt self-serving monetary and fiscal policies. The loss in welfare from these imprudent policies might be even greater than the loss in the current situation with capital flight. In some sense, the ability of private capital to "vote with its feet" may prevent politicians from eroding national wealth by adopting policies favoring special interest groups at the expense of the country as a whole.

3.2 Capital Flight Reflects Discrepancies

Between Private and Social Rates of Return

In most discussions of capital flight from developing countries, there is the presumption that the social rate of return on capital invested in developing countries is higher than the social return on capital invested in the industrialized countries. After all, LDCs are presumably capital-scarce countries, so the flow of capital into LDCs should improve worldwide resource allocation. Yet the private incen-
tives faced by firms and individuals may not accurately reflect the potential for these global benefits. It is these discrepancies between private and social benefits and costs that, in classical welfare economics, provide the justification for government intervention as opposed to laissez-faire.

Discrepancies between private and social rates of return can arise for a number of reasons. They may involve:

(a) differences between the return domestic savers can earn on domestic as opposed to foreign assets that cannot be explained by differences in risk;

(b) differences between the private return on saving (obtained by holding either domestic or foreign financial assets) and the return on real capital investment in the LDC; or

(c) differences between the private and social returns on external borrowing or lending.

Discrepancies of type (c) are taken up under point 6 below. Discrepancies of types (a) and (b) are common in countries that have repressive financial-sector policies where interest rate ceilings keep deposit rates of interest well below their market-clearing levels, and the inflation tax is a major source of finance for large fiscal deficits. These policies, coupled with high reserve requirements, create a large "wedge" between domestic lending and deposit rates. Furthermore, this wedge gets larger as the inflation rate rises. Thus, even if banks' lending rates accurately reflect the productivity of
their customers' capital investments (which they often do not, particularly if credit is allocated by administrative mechanisms to "priority" sectors), the rate that savers receive on time deposits may be far below the social return on domestic investment. If domestic savers are given the option of holding foreign assets, which pay uncontrolled interest rates, "too much" domestic saving will flow abroad. Hence, policymakers may feel justified in restricting capital flight (as well as longer-term capital outflows) in an attempt to force domestic savings to be invested within the economy.

This is not to say, of course, that restricting speculative capital flows is the optimum or even the second-best policy response. In fact, measures to counter capital flight are also likely to interfere with longer-term capital movements as by impeding debt servicing and profit remittances. It would be preferable to attack directly the underlying causes of capital flight, namely severe financial market distortions, rather than merely treat the symptom, i.e., capital flight itself, by imposing capital controls.

The incentives for capital flight created when domestic interest rates are kept below market-clearing levels, causing a large interest-rate differential in favor of foreign assets, are accentuated by expectations of major devaluations. Such expectations often develop in response to chronic fiscal deficits, the high inflation resulting from monetization of these deficits, and timidity in adjusting the nominal exchange rate. If domestic interest rates were market determined, growing expectations of devaluation would cause domestic rates to rise. This equilibrating movement of interest rates would
reduce the amount of capital flight but is prevented by administrative controls on interest rates. As the real exchange rate becomes increasingly overvalued, it severely distorts the relative price of foreign goods and financial assets. The privately-perceived price, given the overvalued exchange rate, underestimates the true social price of imported goods. Capital flight is "bad" insofar as it facilitates the resulting misallocation of resources.

In the situation described above, domestic authorities may advocate foreign exchange controls, at least as a short-run "crisis management" tool. In the longer run, however, this policy is no substitute for a realignment of the exchange rate.

3.3 Capital Flight Contributes to Erosion of the Domestic Tax Base

There are other situations where it can be convincingly argued that the social return on domestic investment exceeds the return on capital that flees abroad. These involve public finance considerations. First, capital flight may greatly reduce the efficacy of the inflation tax on domestic money holdings -- a tax that many developing countries must rely heavily on because they lack well-developed financial markets where government securities can be issued to finance fiscal deficits. Second, governments have difficulty taxing income generated or wealth held abroad. For example, a government may borrow abroad for social infrastructure projects which themselves generate little foreign exchange (such as highways or hydroelectric projects), even though they have a high social value. Although the private sector benefits from the project (in terms of increased foreign exchange earnings), individuals may escape the taxes levied to pay for the pro-
ject by holding much of their increased wealth abroad. Because of the
government's limited ability to tax this wealth, it may encounter debt
servicing problems if it undertakes public investment projects that
cannot be paid for by levying direct user charges.

3.4 "When Capital Leaves It Never Comes Back"

This concern derives from an implied irreversibility in the
allocation of domestic saving. Once the incentives for capital flight
exist and capital outflows occur, it may not be possible to bring about
a "reflow" of capital at a later date merely by moving incentives in the
other direction. This is particularly likely when capital flight is
induced by near-hyperinflation conditions, political instability or
lack of confidence in the domestic financial system. It takes much less
time for a government to destroy a reputation for monetary, financial,
and political stability than to rebuild one after a period of
imprudence.

Regarding the proposition that once capital flees it never
comes back, it is interesting to note that our capital flight estimates
for some countries (e.g. Argentina, Brazil, Peru, Uruguay, and
Venezuela) do indicate periods of reverse capital flight (i.e. negative
rather than positive entries in Table 1) suggests that the incentives
for capital flight have been reduced. Furthermore in Appendix A, I
tested empirically for an asymmetric response of capital flight to
decreases in the real exchange rate. No supportive evidence is found
using quarterly data for Argentina and Mexico but a more extensive
empirical investigation would be worthwhile.
In spite of the lack of supporting empirical evidence, the presumption that speculative capital outflows are very difficult to reverse has inspired a number of LDC policy proposals suggesting tax holidays and amnesty for those who bring back capital held abroad. These proposals, however, make the unwarranted assumption that it is the holding of assets abroad per se, rather than the government's inability to tax them in order to service the external debt of the public sector, that is contributing to external imbalance problems. Perhaps greater emphasis should be placed on international tax treaties and agreements to exchange information that would facilitate the broadening of LDC tax bases to include the residents' foreign asset holdings. These actions seem preferable to and have no lower odds of success than policies that attempt to repatriate wealth amassed abroad. Of course, stable macroeconomic and financial policies would also be beneficial.

3.5 Capital Flight Reduces Domestic Investment

This point follows immediately from the preceding discussion. The presumption here is that the capital that has fled the country would have been invested domestically if controls were imposed to prevent capital flight. The extent to which this is true, of course, depends on what happens to the domestic saving rate when capital outflows are prohibited and what use the funds would have found (e.g. financing fiscal deficits, consumption loans, or capital investment). In an environment where domestic interest rates are severely repressed, restrictions on the purchase of safe, high-yielding foreign assets may dramatically reduce the domestic saving rate. Particularly if a major devaluation of the domestic currency is imminent, there may be a surge
in the private demand for imported consumer durables and luxury goods financed by a reduction in saving.

In short, when severe economic disequilibrium creates strong incentives for capital flight, capital controls may not succeed in redirecting domestic saving from foreign investment towards domestic investment. Rather, they may further reduce the incentives to save or divert savings towards inflation hedges such as real estate, thereby further reducing the country's growth potential as well as its investment income from abroad.

In the above situations, it is clear that capital flight is merely a symptom of inappropriate financial, macroeconomic, and exchange rate policies. The symptom may or may not disappear if foreign exchange controls are imposed on short-term capital outflows.

3.6 Capital Flight Drives Up The Marginal Costs of Foreign Borrowing

Particularly when the government is unable to tax assets held abroad, capital flight may indirectly cause increased government (or public enterprise) borrowing abroad. This is because fiscal deficits are larger than they would be if capital flight did not erode the tax base. As external borrowing rises, the marginal cost of borrowing rises relative to LIBOR (see Edwards, 1984). If governments could tax the foreign assets or incomes of their constituents, international lenders might reasonably be expected to regard those assets as collateral, broadly defined, for their loans to national governments. In this case, borrowing costs would depend on a country's net external indebtedness,
i.e. public and private debt minus official reserves and net private-sector assets abroad.

In the absence of such collateral, private capital flight that necessitates increased government external borrowing raises the national cost of foreign borrowing. There is, of course, an asymmetry here. The interest rate earned on assets held abroad does not increase with the amount invested; the interest rate paid on foreign borrowing does increase with the amount borrowed. Private investors' actions thereby inflict a loss on the country as a whole, because they fail to internalize negative effect of their actions on the government's external borrowing costs. The optimal policy response in this case would be for the government to tax private capital outflows in order to eliminate the discrepancy between the private and social costs of acquiring and holding foreign assets. If this is not feasible, capital controls may be an appropriate policy response.

3.7 Capital Flight Erodes the Legitimacy of Mixed Economic Systems

Diaz-Alejandro has elaborated on the above distinction between private assets and public liabilities, emphasizing its larger political consequences. He views capital flight as part of a larger problem, where a country's external debts have been assumed by the public sector even if they were contracted initially by the private sector, yet the external assets of the private sector remain strictly private:

"By 1984 most of the private external debt had been socialized (as in Chile), or its servicing is being subsidized, via special exchange rates, repayment schedules, or tax concessions... The private assets abroad, however,
have remained strictly private. 'Public' debt is public for being both the responsibility of the state, and for being highly publicized. 'Private' assets belong mostly to households and are also surrounded by secrecy. This situation reduces the political legitimacy of efforts to service the external debt; indeed, it has generated a legitimacy crisis for the role of the private sector in Latin American development." (1984, p. 74).  

Díaz-Alejandro goes on to emphasize that industrial countries have unwittingly encouraged this erosion of legitimacy by maintaining banking secrecy laws and eliminating withholding taxes on investment earnings of foreigners. These regulations encourage capital flight and tax evasion, and ultimately make it more difficult for developing countries' governments to tax their nationals' wealth in order to service the massive foreign debts. Whether or not one interprets these developments as "bad", of course, depends on one's political persuasion.
4. THE ECONOMIC DETERMINANTS OF CAPITAL FLIGHT

This chapter studies the determinants of capital flight that are economic as opposed to the political or psychological in nature. The approach is two-pronged. First, the recent macroeconomic history of each country in Table 1 is surveyed with a view to explaining the swings in capital flight. This survey repeatedly points to overvaluation of the real exchange rate (and, presumably, fears of a major devaluation) and, in some cases, to high domestic inflation rates as important determinants of capital flight. Second, findings of a simple econometric analysis are reported; they confirm the predominant role of these causes of capital flight in the 1974-82 period.

We also investigated econometrically whether the difference between domestic and U.S. interest rates had any power to explain capital flight during the subperiods when interest rate data are available. It was unclear a priori, however, whether increases in domestic interest rates would be positively or negatively related to capital flight in the case where interest rates are market determined rather than set by policy makers. This is because of potential simultaneous equation bias. Political or financial crises, for example, are likely to cause market-determined interest rates to rise, while at the same time inducing capital flight. A regression of capital flight on the domestic interest rate, plus a number of other explanatory variables, may thus yield a positive coefficient on the domestic interest rate. Yet, an increase in domestic interest rates caused by tight domestic monetary policy should cause a reduction in capital flight, and thus yield a negative coefficient. The use of instrumental variable
estimators did not resolve this ambiguity, perhaps because of the absence of a good proxy for political or financial crises or changes in risk.

Before proceeding, it should be re-emphasized that for six of the eight countries, the statistical analysis is based on only nine annual observations (1974-82 inclusive). Hence the econometric techniques must necessarily be kept simple and the results should be interpreted with caution. In spite of the small number of observations, however, the explanatory variables were often highly significant. In the cases of Argentina and Mexico, quarterly data were available for the periods 1976:I - 1983:II and 1975:I-1982:IV, respectively, permitting more reliable results to be obtained for these two high-capital-flight countries.

4.1 The Portfolio Adjustment Model

The estimated capital flight equation is based upon a standard three-asset portfolio adjustment model (e.g. Johnson (1976) or Purvis (1978)). At time \( t \), domestic households allocate their wealth among domestic financial assets \( D_t \), domestic inflation hedges such as land \( H_t \), and foreign financial assets \( F_t \). The steady-state or "target" levels of these private holdings are assumed to be proportional to steady-state wealth (which is assumed to be constant in what follows), with the proportions depending on the domestic interest rate \( r_t \), the foreign interest rate augmented by the expected rate of depreciation of the domestic currency, \( r_t^* + x_t \), and the domestic inflation rate \( \pi_t \). These three variables are, of course, the nominal returns on the
alternative assets held by domestic residents. The target asset demands (indicated by asterisks) are:

\[ D^*_t = b_{10} + b_{11} \pi_t + b_{12} r_t + b_{13} (r^*_t + x_t) \]  \hspace{1cm} (1)

\[ F^*_t = b_{20} + b_{21} \pi_t + b_{22} r_t + b_{23} (r^*_t + \pi_t) \]  \hspace{1cm} (2)

\[ H^*_t = b_{30} + b_{31} \pi_t + b_{32} r^*_t + b_{33} (r^*_t + \pi_t) \]  \hspace{1cm} (3)

Due to the costs of portfolio adjustment, these target levels are approached gradually over time, as indicated by this partial adjustment mechanism:

\[ \Delta D_t = \lambda_{11} (D^*_t - D_{t-1}) + \lambda_{12} (F^*_t - F_{t-1}) + \lambda_{13} (H^*_t - H_{t-1}) \]  \hspace{1cm} (4)

\[ \Delta F_t = \lambda_{21} (D^*_t - D_{t-1}) + \lambda_{22} (F^*_t - F_{t-1}) + \lambda_{23} (H^*_t - H_{t-1}) \]  \hspace{1cm} (5)

\[ \Delta H_t = \lambda_{31} (D^*_t - D_{t-1}) + \lambda_{32} (F^*_t - F_{t-1}) + \lambda_{33} (H^*_t - H_{t-1}) \]  \hspace{1cm} (6)

where \( 0 < \lambda_{i,j} < 1 \) for all \( i \) and \( j \).

Substituting the target demands from (1)-(3) into (4)-(6) yields:

\[ \Delta D_t = a_{10} + a_{11} \pi_t + a_{12} r_t + a_{13} (r^*_t + x_t) \] 

\[ -\lambda_{11} D_{t-1} - \lambda_{12} F_{t-1} - \lambda_{13} H_{t-1} \]  \hspace{1cm} (7)
\[ \Delta F_t = a_{20} + a_{21} \pi_t + a_{22} r_t + a_{23} (r_t^* + x_t) \]

\[ -\lambda_{21} D_{t-1} - \lambda_{22} F_{t-1} - \lambda_{23} H_{t-1} \]  

Equation (8) shows that "capital flight", defined as the year-to-year change in domestic holdings of foreign financial assets, is a linear function of (i) the domestic inflation rate, (ii) the domestic interest rate, (iii) the foreign interest rate plus the expected rate of depreciation in the domestic currency, and (iv) lagged values of asset holdings \((D_{t-1}, F_{t-1}, H_{t-1})\). In light of the small number of observations in our data sample, our estimates of the capital flight (KF) equation included only the first three explanatory variables, which capture the relative rates of return on the alternative assets. Therefore, the estimated version of equation (8):

\[ \Delta F_t = a_{0} + a_{1} \pi_t + a_{2} r_t + a_{3} (r_t^* + x_t) \]

where \(a_1 < 0, a_2 < 0, a_3 > 0\) are the expected signs of the estimated coefficient (assuming capital outflows are measured as positive values of KF, contrary to balance of payments accounting convention).
4.2 Exchange Rate Expectations

One problem remains, namely, to find an empirical proxy for the expected depreciation of the domestic currency \( x_t \). The expected rate of currency depreciation \( x_t \) is assumed here to be proportional to the difference between the current real effective exchange rate \( \text{REER}_t \) and its equilibrium rate \( \bar{R} \), expressed as a percentage of the latter. The equilibrium rate is assumed to be constant through the sample period at its 1977 value of 100. Thus:

\[
x_t = a (\text{REER}_t - \bar{R}).
\] (11)

Admittedly, the assumption that the equilibrium real effective exchange rate is constant between 1974 and 1982 may be questionable for several of the countries studied. For example, major changes in oil prices (and hence the terms of trade) presumably affected the equilibrium value of the real exchange rate in Mexico and Venezuela. Trade liberalization may have had a similar effect in, for example, Chile.

Sebastian Edwards suggested to me that the premium between a country's black market exchange rate and its official rate be considered as a proxy for the degree of exchange rate disequilibrium. Unfortunately, Pick's Currency Yearbook, which publishes black market exchange rates, temporarily ceased publication at the end of 1979 (although it began anew in 1982). Because of data availability problems, therefore, we could only take up this suggestion for Mexico and Argentina where quarterly data were available. The empirical findings were somewhat surprising. None of the regression equations
indicated a significant coefficient on the black market premium. This was the case regardless of whether or not the real effective exchange rate was also included in the regressions.

In the Mexican case, this finding reflects the fact that the black market premium was trivially small over the 1973:I -1979: IV period. It rose to 10-15 percent only in 1976:III, anticipating a major currency devaluation in September of that year.

For Argentina, the black market premia were hefty from 1974:II (100 percent) until 1976:III (86 percent), but very small from 1976:III through 1979:IV. According to Julio Nogués (1984, Table 1), the black market premia in Argentina continued to be small in 1980 and 1981. Perhaps if data for the 1982-84 period -- when capital flight was large -- were available, our econometric tests would have been powerful enough to pick up the effect of black market premia on capital flight.

4.3 Simultaneous Equation Bias

Although it is reasonable to assume that the rate of return on foreign assets proxied here by the US Treasury bill rate is exogenous from the developing country's point of view, the other variables in the estimated equation (10) may not be. Hence, the OLS estimates reported in Table 3 (below) may suffer from simultaneous equation bias due to the endogeneity of \( x, \pi \), and possibly the domestic interest rate (if it is market determined). In some of the countries in our sample, domestic interest rates are not market determined, but rather are fixed by the domestic monetary authority or government agencies responsible for credit allocation. In these cases, \( r_c \) may be considered exogenous.
Simultaneity bias can, in principle, be eliminated by using an instrumental variable (IV) estimation technique. Unfortunately, the resulting coefficient estimates are biased in small samples and have higher standard errors than the corresponding OLS estimates. As Peter Kennedy (1979, p. 113) notes,

"Although the OLS estimator is biased [in the presence of endogenous regressors] in small samples, so also are all alternative estimators. Furthermore, the OLS estimator has minimum variance among these alternative estimators. Thus, it is quite possible that in small samples the OLS estimator has minimum mean square error. Monte Carlo studies have shown, however, that this is true only in very small samples."

Our results are based on a very small number of observations (1974-82), a shortcoming that was overcome to some extent in the Mexican and Argentinian cases, where quarterly data were available from 1975:I-1982:IV and 1976:I-1983:II, respectively. Thus, it is by no means clear that the IV estimates are superior to the OLS estimates for the problem at hand. The conclusions based on the IV estimates are very similar to those based on the OLS estimates, however, so our conclusions are robust with respect to changes in the technique.

The regression results reported in Tables 3 and 4 were the most satisfactory ones obtained from minor changes in specification. Some regressions considered contemporaneous values of the real effective exchange rate (REER), the inflation rate (INF) and the interest differential vis-a-vis the US (ID). Regressions with explanatory
variables lagged one year were also considered. The use of lagged explanatory variables reduces the potential of simultaneous equation bias. The correlations between a country's contemporaneous and lagged values of REER, INF, and ID were typically .40 or less.

The estimation procedure used was to first estimate the general model with the entire rate of return vector \((r, r^*, x, \pi)\), using either contemporaneous or lagged values. In the former case, where simultaneity bias may be a problem, both OLS and TSLS estimates were made. All variables with t-statistics less than unity were dropped, so as to leave more degrees of freedom, and the regressions were re-run. The results reported are the best ones that were found, where "best" means the equation that produced the minimum standard error of regression or maximum adjusted \(R^2\). In cases where several regressions were equally satisfactory, a representative one was chosen, unless the results were conflicting, in which case both were reported.

The most noteworthy feature of the regression results in Tables 3 and 4 is that the extent of currency overvaluation is a highly-significant determinant of capital flight in all four countries where it occurred on a large scale (according to Table 1). Our detailed discussion begins with these four countries: Argentina, Mexico, Venezuela, and Uruguay.

4.4 **Argentina**

Capital flight was an important phenomenon in Argentina in 1976, 1978, and particularly in the 1980-82 period. During the 1970s, Argentina underwent a number of major political and economic changes.
Hence the causes of capital flight in the above-mentioned years are many.

During the Peronist regime, which began in 1973 and ended with a military coup in March 1976, there was a serious deterioration in fiscal discipline. The public sector deficit rose from 4.3 percent of GDP in 1972 to 14.4 percent in 1975, and the inflation rate accelerated to the verge of hyperinflation. Serious distortions emerged as the government attempted to control price and wage increases. A huge deficit was recorded in the current account, and the loss of foreign reserves amounted to $1062 million in 1975. Foreign exchange transactions were restricted, and a balance of payments crisis occurred in early 1976 when as $2 billion in external loans came due.

Although there were no limitations on capital inflows by residents or nonresidents, outward movements of capital were restricted in the 1973-75 period. One possible explanation for the small amount of capital flight that occurred in 1974 (according to Table 1) was a relaxation in foreign exchange convertibility limits for purposes of foreign travel that occurred in August of that year. These restrictions were retightened in May of 1975.

Real interest rates declined in late 1975 and early 1976 as inflation accelerated. The downward crawl of the exchange rate was insufficient to offset this new inflation. Hence, as the peso became increasingly overvalued in real terms, and the possibility of a large currency devaluation undoubtedly contributed to a shift of domestic wealth into foreign assets. Given the restrictions on foreign exchange transactions, little of this capital flight shows up in the short-term
capital account of the balance of payments. But a negative errors and omissions entry of $221 million in 1976 is indicative of the outflow of private capital in 1976. Political instability, which led up to and followed the military coup in March 1976, may also explain part of the capital flight in this year.

In April 1976 the new military government initiated far-reaching trade, financial, and fiscal reforms. The intention was to open the economy to world trade by eliminating quantitative restrictions on imports, reducing the level and dispersion of tariffs, and unifying the system of exchange rates. The public sector deficit was reduced from 14.4 to 10.0 percent of GDP in 1976, and the inflation rate dropped dramatically in the first half of the year.

In mid-1977 the economy underwent a major financial reform involving the deregulation of deposit rates of interest, a reduction in banks' reserve requirements, and the paying of interest on commercial banks' reserves. These moves, plus a large current account surplus and a near-equilibrium exchange rate explain the lack of capital flight during 1977. In fact, our estimates in Table 1 indicate that a "reflow" of capital occurred.

In 1978 the situation began to change again. Confronted by accelerating inflation and real interest rates that turned negative as nominal rates lagged behind inflation, the government elected to float the exchange rate in May 1978. In December, however, it adopted a new strategy of preannouncing the path of the exchange rate for the next 6 months. The objective was to bring down inflation by slowing the rate of currency depreciation, and thus slowing the rate of increase in the
domestic-currency prices of tradeable goods. Unfortunately, inflation responded sluggishly, causing the real exchange rate to become severely overvalued between 1978 and 1981.

It seems clear that overvaluation of the peso and the increasing probability of a major devaluation were the primary causes of capital flight in Argentina in 1980–82. The relative openness of the financial market facilitated capital flight by residents who lacked confidence in the government's exchange rate management policy. It is noteworthy that the difference between domestic and foreign interest rates did not provide a good indication of the incentive for capital flight. Rather, like capital flight itself, it was a symptom of other problems in the domestic economy. Although real interest rates became very high in late 1980 and 1981, this was a market response to bank failures and generalized instability in the domestic financial system. The lack of confidence in the domestic financial system and the lack of credibility attached to the government's anti-inflation program partially explain why capital flight increased.

Regression Analysis with Annual Data. Regression 1 in Table 3 shows a highly significant effect of the lagged real exchange rate on Argentine capital flight. Furthermore its coefficient has the expected positive sign. Neither the inflation rate nor interest rates are significant explanatory variables for Argentina's capital flight.

How much capital flight would Argentina have experienced in the absence of the severe overvaluation of its currency? Suppose we choose an "equilibrium level" for the real exchange rate such as 1977, when Argentina's real effective exchange rate index was set equal to
100, implying $x = 0$. The regression equation then predicts a negative rather than a positive value for the dependent variable equal to $730$ million. This suggests that in the absence of exchange rate overvaluation, Argentina would not have experienced capital flight, but an additional capital inflow of $730$ million per year during the 1970s and early 1980s. This inflow may, of course, reflect increased foreign lending rather than a repatriation of any capital that may have fled in earlier years. The calculation assumes that the country would have faced no constraint on capital inflows from abroad, which was not the case after the Latin American debt crisis materialized in the early 1980s. Whether the debt crisis would have occurred under a different mix of domestic policies is an open question. Nevertheless, the simple calculation above suggests that the magnitude of the estimated regression coefficients is reasonable.

Regression Analysis with Quarterly Data. In the Argentinian case, it was possible to obtain quarterly data on capital flight, the real exchange rate and the domestic inflation rate for the period 1976:I - 1983:II. The regression results are reported in Table 4. Using these data, the coefficient on the contemporaneous (rather than lagged) real effective exchange rate was highly significant with the expected positive sign. As with annual data, the domestic inflation rate was not significant.

If the REER is set at its 1977 value of 43.44 (not 100 as it was in the annual data), the regression equation predicts that Argentina would have had short-term capital flight of approximately $162$ million per quarter or $646$ million per year. This is perhaps a more believable
Table 3: Regression Results on Determinants of Capital Flight

<table>
<thead>
<tr>
<th>Country</th>
<th>Constant</th>
<th>x</th>
<th>x(-1)</th>
<th>Lagged</th>
<th>r</th>
<th>r(-1)</th>
<th>r(-2)</th>
<th>D.W.</th>
<th>$\hat{\sigma}^2$</th>
<th>Estimation technique</th>
</tr>
</thead>
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<tr>
<td>Argentina</td>
<td>-730.30</td>
<td>60.58</td>
<td></td>
<td></td>
<td>-126.39</td>
<td>84.01</td>
<td>2.72</td>
<td>.66</td>
<td>OLS</td>
<td></td>
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<td></td>
<td>(.74)</td>
<td>(3.80)</td>
<td></td>
<td></td>
<td>(1.68)</td>
<td>(1.85)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Brazil</td>
<td>1,578.53</td>
<td></td>
<td>37.30</td>
<td>171.49</td>
<td>134.95</td>
<td></td>
<td>2.67</td>
<td>.57</td>
<td>OLS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.13)</td>
<td></td>
<td>(2.27)</td>
<td>(1.77)</td>
<td>(3.66)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Chile</td>
<td>-253.22</td>
<td></td>
<td>218.33</td>
<td>107.49</td>
<td></td>
<td>2.90</td>
<td>.22</td>
<td>TV</td>
<td>($t^*, \sigma_{IV}$)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.66)</td>
<td></td>
<td>(1.03)</td>
<td>(1.14)</td>
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<td>Korea</td>
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<td>-147.37</td>
<td>225.18</td>
<td>5.72</td>
<td></td>
<td>2.14</td>
<td>.80</td>
<td>OLS</td>
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<td></td>
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<tr>
<td></td>
<td>(1.38)</td>
<td>(1.95)</td>
<td>(1.17)</td>
<td>(1.83)</td>
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<td>Mexico</td>
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<td>227.36</td>
<td></td>
<td>2.70</td>
<td>.36</td>
<td>OLS</td>
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<td></td>
<td>(2.57)</td>
<td>(2.80)</td>
<td></td>
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<td>Peru</td>
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<td>2.56</td>
<td>.31</td>
<td>IV</td>
<td>($t^*, \sigma_{IV}$)</td>
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<td>(1.81)</td>
<td>(1.21)</td>
<td></td>
<td>(1.48)</td>
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<td>Uruguay</td>
<td>1,407.63</td>
<td>19.77</td>
<td></td>
<td>-16.84</td>
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<td>2.90</td>
<td>.85</td>
<td>OLS</td>
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<td>(3.15)</td>
<td>(5.20)</td>
<td></td>
<td>(2.30)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td>-1,298.66</td>
<td>223.01</td>
<td></td>
<td>176.51</td>
<td></td>
<td>1.22</td>
<td>.81</td>
<td>OLS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.08)</td>
<td>(5.38)</td>
<td></td>
<td>(1.62)</td>
<td></td>
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<tr>
<td></td>
<td>-1,861.75</td>
<td>197.74</td>
<td></td>
<td>224.23</td>
<td></td>
<td>1.70</td>
<td>.80</td>
<td>IV</td>
<td>($t^*, \sigma_{IV}$)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.18)</td>
<td>(4.06)</td>
<td></td>
<td>(1.64)</td>
<td></td>
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</tbody>
</table>

Note 1. The numbers in parentheses under the coefficient estimates are t-statistics.

Note 2. The definitions of the instrumental variables (IV) referred to in the Table are taken from the IMF's International Financial Statistics: $^* =$ US T-bill rate; $\sigma_{I}$, government spending (line 82, IFS); FB, government net foreign borrowing (line 84a, IFS); DN, government net domestic borrowing (line 84a, IFS); DCC, change in domestic credit (the change in line 32, IFS).
Table 4: Regression Results Using Quarterly Data

<table>
<thead>
<tr>
<th>Regression</th>
<th>Constant</th>
<th>REER</th>
<th>$\pi$</th>
<th>R²</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>-612.93</td>
<td>17.83</td>
<td>0.11</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>1976:I - 1983:II</td>
<td>(1.10)</td>
<td>(2.15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>-5257.08</td>
<td>54.51</td>
<td>41.43</td>
<td>0.32</td>
<td>1.74</td>
</tr>
<tr>
<td>1975:I - 1982:IV</td>
<td>(3.21)</td>
<td>(3.60)</td>
<td>(3.55)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
number than the estimated additional inflow of $730 million that was obtained from our regression based on annual data. In any event, it is much smaller than the estimated capital flight of $2,301, $8,680 and $4,978 millions that occurred in 1980, 1981, and 1982, respectively, according to Table 1.

4.5 **Mexico**

Mexico experienced huge capital flight during the period 1974–82. **No exchange controls** were imposed on capital receipts or payments by residents or non-residents between 1954 and mid-1982. In the early 1970s, rapidly rising public expenditure caused a **large fiscal deficit** (8 percent of GNP in 1976) and accelerating inflation. Significantly **negative real interest rates** and an **overvalued currency** emerged (because the nominal exchange rate was fixed until 1976). The current account also deteriorated as public expenditures grew without restraint. All these factors contributed to capital flight.

In September 1976, Mexico introduced a managed floating exchange rate, terminating a twenty-two year era of fixed parity. The currency was immediately devalued. During the same year, the Bank of Mexico authorized credit institutions to accept foreign currency time deposits from any Mexican resident (rather than just residents in the northern border areas, as was previously done), and guaranteed net yields of one percentage point above prevailing Eurodollar rates on US dollar denominated time deposits.

In December of 1976, a new administration took office and adopted a comprehensive stabilization program (1977-79) sanctioned by the IMF. The inflation rate fell in 1977 and the fiscal deficit was
reduced. An upward revision in estimated oil reserves led to increased optimism about Mexico's economic prospects. These factors contributed to the sharp reduction in capital flight during 1977-79.

But optimism about the Mexican economy disappeared by 1981. The inflation rate had begun to increase in 1980, leaving the domestic real interest rate much lower than prevailing international rates. The Mexican peso again became overvalued, and fiscal deficits soared. These factors increased uncertainty regarding prospects for the Mexican economy and induced massive capital flight in 1980-83.

Regression Analysis Using Annual Data. Regressions using contemporaneous values of the explanatory variables were superior (in terms of goodness-of-fit) to those based on lagged values. The regressions reported in Table 3 are representative. Both the OLS and IV estimates show that real exchange rate overvaluation had a highly significant negative coefficient — as theory would predict. The estimated coefficient on the domestic interest rate, however, was surprising. Increases in the interest rate increased capital flight, possibly reflecting a high (political or financial) risk premium. The inflation rate was statistically insignificant and hence was dropped from the equation.

The regression results suggest that Mexico's problem with capital flight would have been mild if it had undertaken policy measures to keep the real exchange rate near its 1977 value of 100 and domestic interest rates at, say, 20 percent. Under this scenario (x = 0 and r = 20), the regression equation using the IV estimation technique predicts capital flight equal to roughly $427 million per year, considerably less
than the amount that actually occurred in the early 1980s according to Table 1. We reiterate that this simple exercise should be interpreted with caution. Nevertheless, it is suggestive.

**Regression Analysis with Quarterly Data.** Quarterly data on Mexican capital flight, real effective exchange rates, and inflation were available for 1975:I to 1982:IV. The regressions with quarterly data confirmed the importance of currency overvaluation. High inflation was also an important determinant of capital flight. As Table 4 shows, both the REER and \( \pi \) are highly significant and have the expected signs (Table 4) in the regressions using quarterly data.

As a check on the reasonableness of the regression equation, suppose that the REER is set equal to 80, its approximate level in the "equilibrium" year 1977. \( ^4 \) The inflation rate is again set at 20 percent. Under this scenario, Mexico would have had an additional capital **inflow** of approximately $68 million per quarter or $271 million per year — perhaps a more believable number than the $427 million obtained from the regression above using annual data.

4.6 **Venezuela**

Except for 1974, Venezuela experienced no problem with capital flight until the 1980-82 period. Throughout the period under study, the country maintained a fixed exchange rate and a convertible currency on both current and capital accounts. Domestic inflation was in the 7 to 10 percent range from 1973 to 1978, before climbing to 12.4, 21.5, and 16.0 percent in 1979, 1980 and 1981, respectively. This caused the real effective exchange rate to rise above the stable level maintained
throughout the 1970s. By 1982, the domestic currency had become overvalued by perhaps 30 to 40 percent.

Cline (1983) sums up the balance of payments performance of Venezuela by distinguishing four clear periods: "large surpluses in 1973–75, growing deficit in 1976–78, renewed surplus in 1979–81, and evaporation of the surplus coupled with capital flight in 1982. Oil prices dominated performance, but the rapid growth of imports in 1979–82 [as the exchange rate became increasingly overvalued] also played a role." He goes on to blame the large rise in external indebtedness on consolidated public sector deficits that rose from 1.2 percent in 1977 to 9.5 percent in 1978. The size of the domestic capital market that could be tapped to finance these surging deficits was limited because interest rates were maintained at artificially low levels. Hence, the government turned increasingly to foreign financing, mostly from commercial sources and with short maturities.

In the early 1980s, as high public sector deficits continued and the oil market weakened significantly, fears of exchange rate devaluation grew. The inability of the Venezuelan government to convert its large short-term debt into long-term debt in the wake of the Mexican debt crisis exacerbated these fears. Given the lack of restrictions on the outward movement of capital, massive capital flight occurred. In February 1983 the Venezuelan Bolivar was devalued for the first time in twenty years and a multiple exchange rate system was implemented.

Regression Analysis. The regression equation for Venezuela in Table 3 confirms that overvaluation of the real exchange rate (x) and high domestic inflation (π) are important causes of Venezuelan capital
Venezuela's inflation rate averaged 11 percent over the 1974-82 period (compared to 9 percent in the US). Its currency appreciated dramatically in real terms during the later part of this period. The OLS regression indicates that if the REER had been maintained at the level prevailing in the early 1970s (so that $x = 0$) and inflation had been kept in the nine percent range, the predicted amount of capital flight would have been a modest $190$ million per year, much less than the $15.8$ billion that actually occurred in the three year period 1980-82.

4.7. **Uruguay**

Between 1974 and 1979, government intervention in Uruguay's credit market was gradually reduced. The principal aspects of the 1974-79 financial sector liberalization included the legalization of domestic holdings of foreign-currency assets in 1974, the elimination of sectoral credit allocation guidelines in 1975, and the gradual lifting of interest rate ceilings with their abolition in 1979. During this period, the government also eliminated its budget deficit. All of these factors reduced the incentives for capital flight.

In 1980, however, problems began to develop. An increasingly overvalued Uruguayan peso and a reduction in direct export incentives led to stagnating exports (especially construction exports to Argentina). Worsening external conditions, combined with an anti-inflationary policy, produced a slowdown in output growth to 1.9 percent in 1981 and a 9.7 percent contraction in 1982 (Hanson and de Melo (1975, Table 2)).
Economic deterioration in Argentina, Uruguay's most important trade partner, resulted in successive massive devaluations of the Argentinian peso starting in March 1981. At this juncture, expectations developed in Uruguay that its current-account deficit was unsustainable and that a devaluation of the Uruguayan peso would be necessary. A fiscal deficit exceeding 10 percent of GDP in 1982 added further doubt about the viability of the anti-inflation program. Exchange rate overvaluation and the prospect of a growing fiscal deficit led to large capital flight in 1982.

**Regression Analysis.** Table 3 reports capital flight regression results for Uruguay using lagged values of the three explanatory variables. All three variables are highly significant, but the inflation rate coefficient is negative, which asserts that increases in the inflation rate have been associated with reduced capital flight.

The estimated regression equation for Uruguay suggests that policies designed to hold the real exchange rate at its 1977 level, inflation at 20 percent (rather than the average of 55 percent over the 1974-82 period), and the domestic interest rate at 30 percent (rather than the average rate of 44.3 percent) would have resulted in an annual capital flight figure of $623 million. This is less than the massive capital flight that actually occurred in 1981 and 1982, although somewhat higher than the average annual rate of capital flight of $139 million for the 1974-82 period.

4.8 **Chile**

Chile is an unusual country in that it had "negative" capital flight during 1974-82. Dornbusch (1985) notes that Chile had very
restrictive controls on capital flows until 1979 when the capital account was liberalized. As Corbo (1985) contends, however, these controls pertained mostly to capital inflows rather than outflows. Starting in 1976, domestic residents were allowed to purchase $1,000 of foreign exchange per month. This limit was gradually raised to $10,000 per month in late 1978. With the adoption of a unified flexible exchange rate on August 6, 1982, all restrictions on foreign exchange transactions were eliminated briefly. Between August 6 and September 20, the Chilean central bank lost $450 million in reserves in a futile attempt to stem the subsequent collapse of the peso. Corbo (1985, p. 908) notes that "the exchange rate adjustment in the second half of 1982 was difficult because of the large capital outflows [i.e. capital flight] during the period of unstable exchange rates and the sudden drying up of foreign credit due to the debt problems of Argentina, Mexico and Brazil."

The foregoing suggests that it is highly unlikely that the limit on foreign exchange purchases after 1977 was a binding constraint on Chileans who wished to move capital abroad. In part, this was because it was easily circumvented either by recruiting one's relatives and/or employees to request their foreign exchange "allowance" so that these additional dollars could also be exported, or "double-dipping" by visiting several different banks. Because individual's income tax identification numbers had to be furnished when purchasing foreign exchange, however, the possibility of investigation for income tax violations may have deterred some Chileans from purchasing dollars up to their legal limit.
In short, controls on capital outflows were probably not the major reason for the absence of capital flight, at least between the end of 1977 and late 1982, when stricter controls were imposed. But a second explanation is available. Chile deregulated domestic interest rates in 1974, and since that time real domestic interest rates have been considerably higher on average than foreign rates. Furthermore, the military government that took office in 1973 has been successful in reducing the domestic inflation rate. Finally, Chile did not suffer the chronic overvaluation that plagued many Latin American countries during the period.

Table 1 shows significant capital flight in 1982, however. Possible explanations include: (i) the domestic financial crisis in the second half of 1981, (ii) overvaluation of the peso in the second half of 1981 and first half of 1982, which led to expectations of devaluation, and (iii) a drastic reduction in import levels, accompanied by a sharp contraction in private short-term trade credit. ⁶/

**Regression Analysis.** Regression results for Chile, Brazil, Korea and Peru are discussed together below.

4.9 Brazil

Brazil had strict foreign exchange regulations and vigorous enforcement during the period 1974–82. Domestic firms were monitored to ensure that they adhered to the regulations, and residents were not allowed to hold foreign-currency assets. As a result, Brazil's cumulative capital flight during 1974–82 was only 0.5 percent of growth in external indebtedness. Brazil maintained positive, or only moderately negative, real interest rates throughout most of the 1970s. The
indexation of many financial instruments was a key element in preserving interest rates that generally stayed close to, if not always above, the rate of inflation. This may have prevented capital flight from becoming a problem during the seventies.

Since 1980, however, Brazil has had persistent, although relatively small, amounts of capital flight. Two facts may account for this change. The inflation rate jumped after 1979, and the government announced plans for a large devaluation in 1980. Furthermore, domestic interest rates were not fully indexed, so real rates became negative as inflation surged. These factors undoubtedly increased the perceived risk on holdings of domestic financial assets and domestic investment, but strict capital controls apparently limited the amount of capital flight that actually occurred.

4.10 Korea

Korea kept very strict controls on foreign exchange transactions throughout 1974–82. Korean residents generally were not allowed to hold foreign-currency denominated assets. Furthermore, severe exchange rate disequilibrium and high inflation have generally been prevented, meaning that the incentives for capital flight have been mild relative to those in several Latin American countries. Consequently, total capital flight has been minimal.

But Table 1 does indicate some capital flight in three years 1978, 1981, 1982. There are several possible causes. Korea enjoyed an economic boom after the first oil shock, largely due to its Mid-East construction activity, and achieved a current account surplus in 1977. This allowed the Korean government to relax its foreign exchange
controls slightly, allowing more foreign-currency expenses and foreign asset holdings by the foreign branches of Korean firms.

An increase in the line item "net errors and omissions" in 1978 apparently reflects this relaxation of foreign exchange controls, which opened the door for capital flight caused by highly negative real interest rates and accelerating inflation. In 1979, however, Korea adopted a tight monetary policy and high interest rates in order to stabilize the economy. The resulting shortage of domestic credit led Korean firms to seek short-term foreign loans and trade credit, a situation reflected in historically high short-term capital inflows to the private sector in 1980. Monetary policy started to ease again in 1981. As domestic interest rates fell, Korean firms again had an incentive to refinance their short-term foreign liabilities with domestic loans — an incentive that was strengthened by high US interest rates. Thus the data show an increase in capital flight in 1981 and 1982.

The large "errors and omissions" figure for 1982, which exceeded 30 percent of the change in the external debt in that year, was at least partly caused by differences in the accounting methods used by different government authorities to account for shipbuilding exports. A new relaxation of foreign exchange controls, including a large increase in the limit on assets that emigrants could take out of the country, may also be a partial explanation.

4.11 Peru

Overvaluation of the currency occurred in Peru between 1973 and 1975, when domestic inflation coupled with a rigid nominal exchange
rate pushed the real effective exchange rate well above its equilibrium level. Real domestic interest rates were kept negative by interest rate ceilings. High reserve requirements for the commercial banks, and direct credit allocations further distorted domestic financial markets. These distortions made the Peruvian economy highly vulnerable to capital flight, despite strict capital controls. Estimated capital flight amounted to $1,338 million between 1974 and 1977.

In late 1977, the government authorized commercial banks to accept foreign currency deposits. This decision was followed in 1978 by several devaluations, amounting to 30 percent over the year, and a substantial increase in the ceilings on nominal interest rates. These changes initially reduced incentives for capital flight in 1978 and 1979, but were rapidly offset by an acceleration of domestic inflation, which reached 58 percent in 1978 and 67 percent in 1979. This caused a dramatic fall in real interest rates, and a real appreciation of the currency, because of the sluggishness with which policymakers adjusted nominal interest rates and the exchange rate.

The "dollarization" of the economy, as dollar deposits were introduced by commercial banks, and large fiscal deficits accelerated the inflationary process. The shift into dollar assets reduced the availability of domestic credit and shrank the monetary base on which the inflation tax could be levied to finance the fiscal deficit. This further accelerated inflation and dollarization.

Frequent depreciations of the currency beginning in 1980 did not stop capital flight except in 1981, when the real return on domestic deposits turned positive. The ex-post real return on US dollar
denominated deposits in Peru reached 17.2 percent in 1981 after several years of negative real returns. In 1981, Peru experienced a significant reversal of capital flight amounting to $468 million. By 1982, however, tremendous inflation had offset the interest rate adjustments of 1981 and capital flight began anew, amounting to $148 million.

Regression Results for Chile, Brazil, Korea and Peru. Regression results for these four countries yield no empirical support for the view that exchange rate overvaluation contributes to capital flight. Recall from Table 1 that Chile, Brazil, Korea, and Peru had much less capital flight than the other four countries. For Brazil, the inflation rate coefficient had the expected positive sign but was only marginally significant. For Korea, the inflation rate was significant, but entered with a negative rather than a positive sign. Finally, no amount of experimentation with the Chilean or Peruvian data produced any statistically significant coefficients for either contemporaneous or lagged values of x, π or r.

Several explanations for these empirical results are possible. First, the dependent variable measures capital flight, but with a large measurement error. As the true magnitude of capital flight declines, the variance of the measurement error will rise relative to the variance of capital flight, making it likely that the regressions will not perform well. A second possibility is that these countries exhibited no major disequilibria during the 1974-82 period, removing the underlying incentives for capital flight. A third possibility is that stringent controls on capital outflows prevented capital flight from taking place.
Regarding the second point, empirical evidence is available. As Table 5 shows, the degree of variability in real exchange rates, and inflation rates differed markedly among the eight countries. Even for Chile, Brazil, and Peru, where the capital flight problem was less acute than in Argentina, Mexico, Uruguay or Venezuela, the preconditions for capital flight seem to have been satisfied during some years.

The third explanation seems to fit for Brazil, Korea, and Peru. The presence of capital controls greatly reduced the amount of capital flight that would otherwise have occurred given the movements in their real exchange rates and inflation rates between 1974 and 1982.
5. THE EFFECTIVENESS OF CAPITAL CONTROLS

There is widespread support for the use of capital controls, particularly in some Latin American countries where it is often assumed that: (1) capital flight is necessarily bad and (2) capital controls can prevent it. The question of whether or not capital flight is necessarily bad is answered in Chapter 3 by starting with the general presumption that unrestricted international capital movements are welfare improving because they improve the worldwide allocation of loanable funds. The chapter then goes on to qualify this general presumption by providing arguments that capital flight from LDCs may, in many cases, be welfare reducing. The chapters that follow emphasize that capital flight is often a symptom of macroeconomic mismanagement, and that it will cease after sensible, credible policies are restored.

From this vantage point, the imposition of capital controls should be criticized as attaching the symptom rather than underlying cause of the problem. In spite of this general criticism of capital controls, policymakers in crisis situations often exclaim, "Don't tell me whether capital controls are the first-best policy response for attaching capital flight, tell me whether they will work!" This chapter addresses this positive aspect rather than the normative aspects of capital controls.

How effective were capital controls during the 1970s and early 1980s in checking capital flight? To answer this question, it is not sufficient to show that countries with capital controls had little capital flight. Underlying incentives for capital flight, such as overvalued currencies, high and variable inflation, financial
instability, or repressive financial policies, must also be present. Comparing these incentives with the estimates of the amount of capital flight that actually occurred, we conclude that the amount of capital flight did depend importantly on the existence of capital controls. For example, Brazil and Chile had higher inflation on average than did Mexico or Venezuela. Yet the ratios of capital flight to growth in debt were very much lower for Brazil and Chile. Not coincidentally, Brazil had very strict foreign exchange controls during the period studied. Chile had controls on capital outflows although they were probably not binding by the late 1970s. It was devastatingly-high domestic interest rates that prevented capital from flowing abroad.

In the case of Argentina, controls were repeatedly relaxed, then reimposed over the course of the decade. The Argentinian experience demonstrates that the relaxation of controls on capital outflows is likely to cause massive capital flight in a situation where macroeconomic and exchange rate policies interact to create accelerating inflation and an overvalued currency. The incentives for such capital flight in the Argentinian case included the expectation of a maxi-devaluation, the reimposition of controls on capital outflows, and the collapse of the government's anti-inflation program. Given domestic residents' experience and familiarity with international capital markets, it proved impossible to choke off capital flight merely by reimposing limits on capital outflows.

In Korea, by contrast, the strict and vigorous enforcement of capital controls has been long standing. As a result — and because the
exchange rate was never allowed to become severely overvalued — the problem of capital flight has been of minor importance.

In sum it appears that a country's past experience with capital controls, their variability over time, and the vigor of the enforcement procedures greatly affect their potency. Given a volatile domestic economic situation, the temporary relaxation of controls provides opportunities for residents to move assets abroad.

Capital controls significantly reduced capital flight in some of the countries studied. Perhaps even more important is the vigor with which these controls were enforced and their uniformity over time. Controls that were changed frequently and capriciously enforced were less successful in preventing capital flight.

It should be reemphasized that the fact that capital controls have, in some cases been capable of stemming capital flight does not, of course, mean that such controls are a good idea. Even in crises situations, for example, the adoption of a dual exchange rate system, which maintains a relatively fixed exchange rate for current account transactions and a floating rate for speculative financial transaction may be preferable. It has the advantage of allowing the exchange rate to be responsive to fluctuations in speculative supplies and demand for foreign exchange. This exchange rate adjustment, being an equilibrating price signal, tends to reduce speculation. Furthermore the central bank is freed from the onerous obligation of spending valuable foreign reserves in an often futile effort to prevent exchange rate realignment.
6. IMPLICATIONS FOR POLICY

The policy implications of our theoretical, historical and statistical analyses of capital flight are straightforward once its underlying causes are understood. Overvaluation of the currency seems to have been a major contributor to capital flight in Chile (1981-82), Mexico (1974-76 and 1980-82), Uruguay (1981-82), and Argentina (1981-82). These countries had either fixed exchange rates or crawling pegs that did not crawl quickly enough to close the gap between domestic and foreign inflation rates.

High inflation, which is typically accompanied by high variability of the inflation rate, can also be a major cause of capital flight because of the greater uncertainty it attaches to the return on domestic assets. This uncertainty can be reduced but not eliminated by widespread indexation (as in Brazil, for example). Even though ex-post real interest rates might be higher on average than foreign rates in some periods, as they were in the late 1970s and early 1980s in Argentina, Chile and Uruguay, the high degree of uncertainty seems to have driven risk-averse domestic investors into foreign assets.

The incentive that inflation creates for capital flight is greatly exacerbated in economies suffering from repressive financial policies that keep real rates of interest in the domestic economy considerably below those prevailing abroad. A large gap between domestic and foreign real interest rates was important in countries such as Mexico, Peru, and Venezuela where the monetization of large fiscal deficits caused high inflation, but interest rate ceilings prevented positive real rates from being maintained. On the other side of the
coin, however, high real interest rates on domestic deposits encouraged
the repatriation of some capital held abroad in the cases of Chile and
Uruguay after their financial liberalization programs were initiated.

Lack of confidence in the domestic financial system triggered
massive capital flight in countries like Argentina, Chile, and Uruguay
even though their real interest rates rose considerably above those
prevailing in the USA at the time. Financial instability also
contributed to capital flight in Mexico and, to a lesser extent, Korea
and Brazil during 1980-82.

Overly expansionary monetary and fiscal policies, an incompat-
able exchange rate policy, and a repressive set of financial policies
designed to divert resources towards the public sector will cause
widespread distortions and imbalances even in the short run. Capital
flight is an important symptom of these policy-induced distortions.
Attacking this symptom directly by imposing capital controls may be
essential in a short-run crisis situation. It hardly represents a long-
term antidote for destabilizing exchange rate, fiscal, and financial
policies. In the absence of capital controls, the threat of capital
flight may impose much needed discipline on policy makers.
FOOTNOTES

Chapter 2:

1/ The change in external indebtedness is obtained from Dooley et al. (1986). Alternatively, it could have been calculated using the same Balance of Payments Yearbook data that was used in calculating our measure of capital flight. This would have the advantage of consistency among data sources. For some countries the cumulative value of the year-to-year changes in debt reported in the balance of payments over the 1974-82 period falls considerably short of the total change in debt outstanding obtained from debtor and creditor reporting systems. In other cases, the former exceeds the latter. See Dooley (1986) for a comparison of the two approaches.

2/ Commercial banks' net foreign assets are added to those of the central bank on the grounds that the central bank directly or indirectly controls a large fraction of commercial banks' foreign assets in many LDCs.

3/ Dornbusch (1985, Table 8.3) uses a similar technique, but his residual includes net changes in official reserves. According to our definition of capital flight, the latter should not be included.

4/ A recent report by Morgan Guaranty (1986) estimates capital flight for 18 developing countries using the Dooley et al. methodology.
Chapter 3:

1/ Khan and Ul Haque (1985) have recently used an intertemporal optimization framework to show how the simultaneous occurrence of foreign borrowing (i.e. capital inflows) and capital outflows may be a consequence of different perceptions of expropriation risk among domestic and foreign residents.

2/ There is a vast literature on whether or not speculation is destabilizing, including Milton Friedman's 1953 classic. More recent contributions include: Driskell and McCafferty (1980), Krugman (1979), and Kohlhagen (1979).

3/ The growing literature on the time consistency of government policies attempts to incorporate such constraints on policymakers into macroeconomic models with rational expectations.

4/ I surmise that political legitimacy might be eroded because the general public becomes increasingly unwilling to bear an onerous debt burden as it becomes clear that the growth of public-sector debt facilitated the amassing of foreign assets by the privileged classes in society.
Chapter 4:

1/ Most countries report balance of payments information to the IMF in units of the domestic currency. The Fund converts the figures to SDRs when compiling the Balance of Payments Yearbook using the period-average exchange rate of each country's currency against the SDR. All U.S. dollar figures in this paper are calculated by multiplying these SDR figures in the Yearbook by the period-average U.S. dollar/SDR exchange rate.

2/ Contemporaneous values of REER, INF, and ID were not significant when annual data were used.

3/ The inclusion of REER rather than x, when the expectation function in (11) is used, leaves the exchange rate coefficient unchanged. The two specifications are identical except for the equilibrium exchange rate embedded in the constant term.

4/ The base year for the quarterly data for REER is different from that for the annual data where REER=100.

5/ Interest rate data for Venezuela were unavailable.

6/ Changes in trade credit were included in the capital flight estimates for Chile.

7/ In their comparison of Argentina, Chile, and Uruguay, Corbo, De Melo and Tybout (1986) reached similar conclusions independently. See their Table 3 and the surrounding discussion.
REFERENCES


Corbo, Vittorio, Jaime de Melo, and James Tybout, "What Went Wrong with the Recent Reforms in the Southern Cone?" Economic Development and Cultural Change 34, 3 (April 1986), pp.


Appendix A:

Testing for an Asymmetric Response of Capital Flight to Increases and Decreases in the Real Effective Exchange Rate

It is sometimes claimed that capital flight is especially undesirable because once capital has flown from a country "it never comes back." One simple way to test this proposition is to investigate whether countries that have had positive capital flight in some years subsequently ever experience negative capital flight. A quick glance at the Table confirms that such reversals do, in fact, occur; this is evidence against the above-mentioned proposition.

Perhaps support for the hypothesis can be found if it is interpreted as referring to higher elasticities of capital flight to increases in real exchange rates or inflation rates rather than decreases in those variables. In the extreme case where flown capital never returns, decreases in the real effective exchange rate (REER) or inflation rate (π) would have zero effect. In more moderate cases, coefficient on downward movements of REER or (π) should at least be smaller than those on upward movements of these variables.

To test for this asymmetric response, we define a dummy variable $D_t$, which equals zero when the real effective exchange rate REER is rising and one when REER is falling. A new variable $V_t$ is created by multiplying the actual REER series by the dummy variable $D_t$. This series, therefore, has a value of zero in periods when REER rises and the actual value of REER in periods when it falls.
The quarterly regressions in Table 3 were re-run with the additional variable \( V_1 \) included. A significant coefficient on this variable would be evidence of an asymmetric response. We also tried adding \( D_1 \) as well as \( V_1 \) to the regression to cover the possibility that increases and decreases in REER should have been measured relative to the equilibrium rate, which is implicitly incorporated into the constant term, rather than last period's value.

Regardless of which specification was employed, there was only one regression for Mexico or Argentina that produced a significant coefficient on \( V_1 \). It was the following regression for Argentina (1976:I - 1983:II):

\[
\text{KF} = -790.23 + 17.20 \text{ REER} + 12.33 \ V_1 \\
(1.50) (2.17) \quad (1.93)
\]

\[
\text{DW} = 1.89
\]

Surprisingly, however, this equation suggests a coefficient of 17.20 on positive movements of REER and a coefficient with a \textbf{larger} (not smaller) value (17.20 + 12.33) when REER falls.

A similar asymmetric response test was carried out for the inflation variable in the quarterly regression equations for Argentina and Mexico. None of the regressions provided any indication of an asymmetric response.

In sum, our empirical analysis for Argentina and Mexico could find no evidence for the often-stated problem that "when capital flees, it never comes back".
Appendix B:

Capital Flight Effected by Underinvoicing Exports

Underinvoicing of exports is an important mechanism for evading capital controls in many developing countries. Gulati (1985) has recently compared the reported exports by individual LDCs to the total imports from that LDC reported by its trading partners. The extent of the underinvoicing of exports by LDCs is a widespread mechanism for evading controls on capital outflows. Although Gulati's paper presents the average extent of underinvoicing in percentage terms for 101 developing and developed countries, over the 1977-83 period, he has kindly provided the present author with the year-by-year percentages in Table 5.
TABLE 5
CAPITAL FLIGHT EFFECTED BY UNDERINVOICING EXPORTS
(as a percent of reported exports)

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Source: Gulati (1985 and private correspondence).