CAPITAL FLOWS
AND
INVESTMENT PERFORMANCE

Lessons from Latin America

EDITED BY
RICARDO FFRENCH-DAVIS
AND **HELMUT REISEN**

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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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Foreword

This publication is the result of a joint research project of the OECD Development Centre and the UN Economic Commission for Latin America and the Caribbean (ECLAC). The project was undertaken in the context of the Centre's research programme on "Macroeconomic Interdependence and Capital Flows".

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Preface

Surges of private-sector driven capital flows to developing countries underpin their growth performance and their commitment to market-friendly policies. However, vastly greater and more volatile capital flows also create new problems: they undermine independent macroeconomic management, and in the closing years of the 1990s were still too focused on a set of emerging markets, notably in low-wage Asia and Latin America. Such flows also tend to displace private savings rather than to supplement them.

This book is a result of the Development Centre's research on "Macroeconomic Interdependence and Capital Flows". It aims to provide insights for policy makers into how foreign savings can be turned into productive investment at the same time as domestic savings are raised. The book presents the findings of a research project jointly undertaken by the Centre and the UN Economic Commission for Latin America and the Caribbean (ECLAC). The research was initiated early in 1996 with a conference at ECLAC headquarters of prominent policy makers and academics dealing with Latin American economies.

Some of the best economists from Latin America were asked to investigate, from analytical and empirical perspectives, how their home countries allocated massive foreign capital inflows during the 1990s. The evidence provided here is based on six Latin American countries which have seen particularly heavy inflows: the three OECD Development Centre member countries — Argentina, Brazil and Mexico — and Chile, Colombia and Peru. This sample provides a rich variety of policy performance, including early and late reformers, countries with pegged and more flexible exchange rate regimes, free and regulated capital flows, and with different qualities in bank regulation and supervision.

The macroeconomic policy lessons drawn from this research relate to foreign exchange regulation, exchange rate and aggregate demand management, and prudential regulation of domestic financial intermediation. They will, as the Asian currency crisis in Summer 1997 demonstrated, be of relevance beyond Latin America.

Jean Bonvin   Gert Rosenthal
President   Executive Secretary
OECD Development Centre   ECLAC
Paris   Santiago

July 1998

I

Capital Flows and Investment Performance: An Overview

Ricardo Ffrench–Davis and Helmut Reisen

ABSTRACT

This book reports the findings of a joint research project of the OECD Development Centre and the UN Economic Commission for Latin America and the Caribbean (ECLAC). The research aimed to investigate analytically and empirically how Latin American countries have allocated massive foreign capital inflows of the 1990s into consumption and investment, and to identify the macroeconomic and institutional prerequisites necessary to turn foreign savings into productive long–term investment, strengthen the complementarity of domestic and foreign savings and achieve sustainable macroeconomic balance.

The research shows that the effects generated by capital inflows vary with the domestic policies adopted. A comprehensive, active policy has proven effective in influencing the composition of capital inflows, their volume and spread across time and their allocation into productive investment, while avoiding excessive outlier exchange–rate appreciation and lending booms. Chile and Colombia illustrate the effective role played by policy.

Latin America offers good prospects for foreign investors, provided the region improves the quality of its absorptive capacity. The self–interest of investors and the well–being of recipient countries would be better served if the volume and composition of flows were absorbed by domestic economies in more efficient and sustainable ways. The papers collected in this volume provide useful insights for understanding past events and for improving policy design.

The Relevance of Investment Performance

The strong correlation between investment and growth rates is well established. It results from the interaction of capital accumulation and technical progress (Schmidt–Hebbel *et al.*, 1996). The 1990s have been a period of heavy capital inflows to Latin America, thus adding foreign savings to domestic savings for financing domestic investment and future growth, provided they were not consumed or wrongly invested.

In the 1950s and 1960s, and even less so in the late 19th century, a study on the link between flows and investment need not have been undertaken. Then, capital flows to developing countries were mostly tied to particular investments and to particular users, financing real assets mostly through direct investment and official project lending. In recent decades, by contrast, a disconnection has occurred between flows of capital and actual investment. Commercial bank lending in the 1970s and private–to–private portfolio investment in the 1990s have made the link between foreign savings and domestic investment quite indirect (Turner, 1996).

Such a disconnection between capital flows and actual investment implies that *i)* inflows will more likely increase consumption than investment[1]; *ii)* they do not necessarily enhance the recipient country's ability to earn foreign exchange through expansion of capacity in the tradable sector; and *iii)* the reversibility of foreign investment is facilitated, as the acquisition of securities is essentially a short–term commitment. In a study of 34 developing debtor countries that had rapidly increased their external liabilities in the 1970s, Cohen (1993) found actually less capital accumulation than in other developing countries, an observation which endogenous factors — the initial output per capita and the initial stock of capital — could not explain. Capital accumulation failed to increase because much of the capital inflow had leaked into consumption.

According to the debt–cycle hypothesis, rarely validated empirically, external savings raise domestic investment and growth, which in turn stimulates savings that eventually contribute to the elimination of net foreign debt. Such a virtuous circle has five requirements, again rarely complied with in practice (Devlin *et al.*, 1995):

— *First*, external capital flows should consistently augment investment, rather than be diverted to consumption;

— *Second*, the investment must be efficient;

— *Third*, the country must invest in tradable (or trade–related infrastructure) to create a trade surplus that will accommodate the subsequent switch in transfers required to service the debt;

— *Fourth*, an aggressive domestic savings effort is called for, with the marginal saving rate exceeding the average saving rate; and

— *Fifth*, the virtuous circle requires capital exporters willing to provide stable and predictable flows at terms in line with the recipient country's factor productivity.

To be sure, the benefits of capital flows do not derive only from directing world savings to the most productive investment opportunities. The developing countries, more shock–prone than richer ones and with low per–capita consumption levels that make any downside adjustment particularly painful, will likely benefit greatly from the international pooling of country–specific risks that would result in intertemporal smoothing of consumption levels. Yet enhanced growth and development — as well as an improved capacity to service their foreign liabilities — will stem only from productive investment of foreign inflows, as the neo–classical and endogenous growth literature as well as the debt cycle hypothesis have emphasised.

In the neo–classical general equilibrium framework, the benefits of capital inflows into (capital–) poor countries derive essentially from divergences in the marginal productivity of capital. Labour in advanced countries has more and better capital than that in developing countries. Thus, sent south, capital can be used more productively until the recipient country's marginal productivity has fallen towards the world interest rate level as the capital–labour ratio rises. The income of the recipient country rises on impact of the inflow — the marginal output of capital times the capital inflow minus interest and dividend payments to the foreign investor. To change the growth rate of the capital recipient permanently, though, the inflow must not only lift the economy to a higher capital stock but also change its production function.

In contrast with the neo–classical growth framework, the endogenous growth literature emphasises the dependence of growth rates on the state of technology relative to the rest of the world. New empirical evidence indicates that foreign direct investment (FDI) flows incorporate technological externalities, provided the host country has a minimum threshold stock of human capital. Borensztein *et al.* (1995) found that for each percentage point of increase in the FDI–to–GDP ratio, the rate of growth of the host economy increases by 0.8 percentage points. The contribution of FDI to long–term growth results from two effects. First, FDI adds to capital accumulation because it stimulates domestic investment rather than crowding it out, through externalities associated with competition in domestic product or financial markets. Second, FDI embodies a transfer of technology and world market access, stimulating both the recipient country's efficiency and its level of domestic competition.

To avoid painful reversals of private capital flows, both the OECD investor and the developing host country have a great interest that such flows are invested productively. Reversals tend to occur, as in the Mexican financial crisis of December 1994 and in Thailand's currency crisis in summer 1997, when capital inflows are perceived as merely being consumed or financing excess capacity in the country's real estate sector. For the recipient country, any shortfall in capital inflows then will require immediate cutbacks in domestic absorption to restore external balance. It will often result in the breakdown of domestic financial institutions as domestic interest rates rise and asset prices tumble, and worsen income distribution as the resulting public bail–out of ailing banks reduces public resources which could have been spent on education and the poor. For the foreign investor, heavy nominal devaluations of overvalued exchange rates and a sharp deterioration in host–country income and consumption levels mean heavy losses as well. Furthermore, the risks of contagion of

a country's financial crisis undermine the benefits of global diversification to the foreign investor, while to the recipient countries it reduces the potential benefits of financial opening as the contagion implies costly capital–flow reversals caused by factors outside their control (OECD, 1997).

Such concerns have led to a G10 Working Party on Financial Stability in Emerging Market Economies, including representatives of the countries in the Group of Ten and of emerging market economies, to develop a strategy for fostering financial stability in the emerging markets. One of the fundamental premises that has guided the Working Party in developing the strategy is that "sound macroeconomic and structural policies are essential for financial system stability to prevent or at least limit the emergence of serious financial imbalance, misleading price signals and distortions in incentives" (Report of the G10 Working Party on Financial Stability in Emerging Market Economies, April 1997). This joint OECD Development Centre/ECLAC project aims at identifying such macroeconomic imbalances and distorted price signals in more detail.

Capital Flows to Latin America

Changes in capital flows have strongly affected Latin America over the last twenty–five years. During the 1970s, a large supply of external funds became available; subsequently, during the 1980s, there was a binding shortage of foreign exchange. Between 1991 and 1994, the region again received large amounts of funds, only to experience another sharp reduction of private capital flows (except for FDI flows which remained stable) in late 1994 and early 1995, and then renewed access in 1996–97.

Capital inflows to Latin America during the 1970s contributed to a decade of significant growth of GDP and investment. GDP grew on average by 5.6 per cent per year and fixed investment by 7.3 per cent. The region attained the highest investment ratio of its history during the second half of the 1970s. FDI came in limited amounts, but the predominant bank loans were essentially long–term up to the late 1970s, linkable to a significant degree to investment projects; Brazil and Colombia represented cases of loans linked to capital formation (Ffrench–Davis, 1983). In Argentina and Chile, by contrast, foreign borrowing, notably larger as a share of GDP, was allocated principally to finance imported consumption goods. Irrespective of country cases, however, all across the region the debt crisis of the 1980s matured during the period of heavy inflows: a rising stock of foreign liabilities and a rising deficit on current account make a pair prone to end in a crisis. The catastrophe brought a sharp drop in economic activity and capital formation, with the investment ratio falling by one–third (see Table 1.1).

During the 1990s, renewed capital inflows again helped improve the economy. This time, however, rather than contributing to the increase of productive capacity, the inflows helped most Latin American countries (LACs) recover from the deep recession that still prevailed in the late 1980s. Real annual GDP growth rose from 1.2 per cent in the 1980s to 3.6 per cent between 1990 and 1994. This growth was meagre, however, and was accompanied by a modest recovery of the investment ratio.

Investment grew much less during the first half of the 1990s than did capital inflows; most of the flows corresponded to short–term bond finance, secondary stock market trading and acquisition of privatised firms. Only about one–fourth of net flows took the form of FDI and primary American Depository Receipts (ADRs) (ECLAC, 1995). Thus, most of the external flows did not link directly with the domestic investment process but financed increased private consumption, crowding out domestic savings (Table 1.1).

Table 1.1. **Latin America: Macroeconomic Indicators, 1976-96**[a]

(as percentage of GDP)

	1976-81	1983-90	1991-94	1995-96
Net capital inflows	4.9	1.2	4.9	4.9
Change of reserves	1.0	0.2	1.5	1.9
Deficit on current account	3.9	1.0	3.4	3.0
Gross capital formation	24.0	16.7	17.9	18.0
Savings	20.1	15.7	14.5	15.0
Real annual GDP growth	5.5[b]	1.6	3.6	1.9

a.   Figures for 19 LACs expressed in 1980 dollars, except for 1995-96 which was calculated with rates of change of figures in 1990 dollars.
b.   Average growth for 1976-80.

The relaxation of a binding foreign exchange constraint brought about by renewed inflows in the early 1990s allowed an increase in aggregate demand. Given improved expectations, that increase expressed itself in a recovery of economic activity. The prevailing excessive installed capacity implied that domestic supply could respond to enlarged demand for non–tradables, while increased imports financed with capital inflows now could cover that for tradable. Progressive exchange–rate appreciation enhanced the process temporarily, contributed further to increase imports and dampened inflation.

Thanks to a higher rate of use of installed capacity, production increased beyond the expansion of output capacity, by some $70 billion in 1994 in comparison with 1990. About one–third of the 3.6 per cent rate of annual growth in GDP in 1991–94 corresponded to greater use of installed capacity, a phenomenon particularly intense in countries like Argentina and Peru.

In brief, the increased availability of external financing was clearly beneficial during those years, inasmuch as it removed the binding external constraint partly responsible for the low levels of investment and the serious economic recession of the region during the 1980s. Yet renewed access to external capital also posed challenges to the stability and sustainability of macroeconomic equilibria and jeopardised chances for attaining sounder development. Indeed, capital inflows had an adverse effect on the evolution of real exchange rates[2], contributed to domestic credit booms, and led to the accumulation of external liabilities (many of which had short–term maturities); thus it made the economy more vulnerable to future negative external shocks, as witnessed by the Mexican crisis in late 1994.

During the 1990s, the deficit on current account rose sharply, exchange rates appreciated, and the stock of external liabilities rose steadily, reflecting a growing macroeconomic imbalance. Recipient countries which experienced particularly fast exchange rate appreciation and high deficits on their current account became increasingly vulnerable to external creditors' sentiment. The creditors' sensitivity to "bad" news rose in tandem with their foreign asset exposure and the recipient countries' dependence on additional inflows to cover current account deficits plus refinancing of maturing liabilities. That was particularly the case for Mexico.

The significant consequences of the lack of sustainability of macroeconomic trends were reflected in the 1995 recessions in Mexico and Argentina, which brought about a sharp drop in domestic fixed investment. Notwithstanding a fast recovery of capital inflows, and with them of economic activity, the biennium 1995–96 shows meagre growth of GDP for all the region, of 1.9 per cent (see Table 1.1). The overall investment ratio in 1996 remains nearly one point below that achieved in 1994. This negative outcome is indicative of the costs of macroeconomic instability led by surges of volatile capital.

Saving and Investment Responses: Some Findings and Explanations

Massive surges in capital inflows have almost immediately rewarded several bold macroeconomic and structural reform programmes that generated spectacular rises in economic activity and growth rates. Such successes, however, have at times distorted key price signals and encouraged excessive consumption or service–sector investment; they could not be sustained. Yet it was crucial, particularly for Argentina, Brazil and Peru, to leave behind hyperinflation and a bad economic policy record — and the renewal of any kind of capital inflow helped a lot. To see this, Carneiro (this volume) emphasises for Brazil that irreversible capital formation has the option to wait until the persistence of a stable policy background has been firmly established. Thus, unstable policies hold domestic investment down and can even destabilise the inflow of FDI. As emphasised by Frenkel, Fanelli and Bonvecchi (this volume) for Argentina, and by Griffith-Jones for Peru, the privatisation of state enterprises and overcoming hyperinflation can induce foreign inflows, relax the external financing constraint and allow exchange–rate based stabilisation. This resulted first in lower inflation which in turn further reduced macroeconomic uncertainty. Higher certainty and the appreciation–induced drop in imported capital–good prices then stimulated domestic investment. Both Frenkel, Fanelli and Bonvecchi and Griffith–Jones note, however, that less exportables–based investment in machinery and equipment but rather construction investment and the rebuilding of corporate working capital were stimulated in the early reform period.

Argentina (since 1991) and Peru (since 1993) witnessed an impressive growth response in the early reform period because installed production capacity had been broadly underused before. Ocampo and Tovar (this volume) also stress the importance

of the investment accelerator as rising growth stimulates investment. At some point excess capacity becomes exhausted, however, as had already happened earlier in Chile (Agosin, this volume). As excess capacity approaches exhaustion, a further increase in aggregate demand manifests itself in a relative rise in the prices of non–tradables. Ocampo and Tovar for Colombia and Agosin for Chile give detailed accounts of the elaborate policy mixes pursued by the authorities to avoid growing macroeconomic imbalances. Peru (see Griffith–Jones) after the Mexican crisis also moderated the rise in aggregate demand to reduce the deficit on current account to more manageable (although still high) levels.

Former studies (such as those by Masson *et al.,* 1995; and by Edwards, 1995) had produced the cross–country evidence that an increase in foreign savings by one percentage point of GDP had been offset by a drop in domestic savings by about one–half point. This research project (Uthoff and Titelman, this volume) confirms the existence of an offset coefficient between foreign and domestic savings at around the same level (–0.47). The rise in government savings throughout Latin America in the 1990s did not manage to lower that offset, as it was more than compensated by the drop in private savings crowded out by the inflow surges.

In principle, foreign savings in open economies can work as a substitute for domestic saving because foreign borrowing can be used to smooth consumption through time. Note, however, that offsetting higher foreign savings through lower domestic savings will destabilise intertemporal per capita consumption rather than smooth it, if the drop in private savings is not backed up by correctly expected higher permanent income levels or by temporarily deteriorated terms of trade (Reisen, 1996).

Uthoff and Titelman go beyond former studies on savings offsets by distinguishing between trend and deviations from trend for foreign and domestic savings. This helps them produce the important finding that the negative offset between foreign and domestic savings is particularly significant and strong when foreign capital flows are above (or below) trend. The authors advance the hypothesis that above–trend capital inflows result in a rapid rise of domestic security prices which, jointly with a real appreciation of the exchange rate, produce a positive wealth effect and stimulate private consumption. This hypothesis is confirmed by Agosin (this volume) in a rigorous specification of Chile's investment function for 1960–94, which emphasises the differential impact of trend versus excessive capital inflows on investment in tradables and non–tradables.

In Agosin's investment model, capital inflows have two long–term positive effects on investment. First, they can relieve foreign exchange and domestic credit constraints, and second, *via* exchange rate appreciation, they reduce the cost of imported capital equipment. Real exchange rate appreciation will, on the other hand, exert a negative impact on the profitability of investment in tradables and hence reduce it. Agosin finds, in line with Uthoff and Titelman, that excessive inflows will lead to a drop in domestic savings. Even a strong real exchange–rate appreciation can produce a fall in tradables investment that exceeds the rise of investment in non–tradables. If, by contrast, foreign exchange and domestic credit constraints are binding (as is the case for most

of Chile's postwar observation period), capital inflows will also stimulate the country's investment in tradables if the effect from relaxing financing constraints outweighs the appreciation–induced loss in profitability.

In the late 1980s, Chile was already relieved of external financing constraints on capacity use and investment. Then, with the capital inflow surge of the 1990s, the management of aggregate demand and of the exchange rate induced a sharp rise in the investment ratio, with rising volumes both from domestic investors (they cover about four–fifths of investment) and FDI. Agosin finds that after the gap between potential and effective use of capacity is eliminated, given prospects of active macroeconomic management, the market foresees that the economy will tend to remain close to the full use of capacity. That increases the expected productivity of investment, encourages a higher reinvestment of profits and pulls up private capital formation (Ffrench–Davis, 1996).

From the growth and debt cycle perspectives of the recipient country, Agosin's finding indicates a clear superiority of FDI compared with other types of capital inflows[3]. First, his autoregression analysis shows FDI (and long–term borrowing) to be more persistent, a result reinforced by looking at the coefficients of variation of different capital–account items around their mean and their trend values; Trigueros arrives at a similar conclusion for Mexico. Second, Agosin finds that FDI exerts a significant crowding–in effect on domestic investment in exportables as well as machinery and equipment investment. This is important, in view of research by De Long and Summers (1991), since machinery and equipment investment, unlike construction investment, importantly explains long–run growth performance and is more likely to go into tradables necessary for later debt service.

Mexico up to 1994 (Trigueros, this volume), very much like Thailand in the runup to its 1997 crisis, testifies to the strong power of two joint channels to allocate foreign inflows into excessive consumption. First, an initially credible dollar peg attracts short–term capital inflows which chase high local rates of return in bank deposits, stock markets or real estate. The inflows in turn lead to currency appreciation which gives an incorrect reading of future relative prices to investors (since at some point the exchange rate is most likely to depreciate in real terms to help service the capital inflows). Second, poor prudential supervision with implicit bailout of bank owners, depositors and even foreign creditors from adverse outcomes, as well as undercapitalised, ill–supervised and ill–monitored banks and other financial intermediaries, will underpin an unsustainable spending boom. In such circumstances, banks tend to borrow heavily abroad and allocate the proceeds domestically, predominantly into consumer and real estate credit. The boom in bank loans transmits rapidly into worsened bank portfolios (Sachs *et al.*, 1996).

Trigueros documents the poor allocation of financial resources through the Mexican banking system. He shows that the banks directed credit where interest margins were high. Thus, the fraction of outstanding household credit to total credit increased from 10 per cent in 1989 to 27 per cent in 1994. During that period, the share of non–performing loans skyrocketed in Mexico; past due payments alone (not the entire

value of non–performing loans) reached a level of close to 9 per cent of banks' total loans. The subsequent bailout of bank owners, depositors and foreign creditors has heavily burdened Mexico's public finances.

The two countries where capital inflows were mostly invested rather than consumed — Chile since 1991 and Colombia since 1994 — used various capital controls to discourage excessive inflows and to influence their term structure. Both Ocampo and Tovar (this volume) for Colombia and Agosin (this volume) for Chile show convincingly that these controls on inflows effectively reached their policy targets. Notably, FDI has become in both countries the major — and stable — source of external financing.

While Colombia has seen important liberalisation of foreign–exchange transactions over the 1990s, especially for FDI, significant controls on short–term inflows remain and were strengthened recently, notably a variable deposit requirement which varies inversely with the maturity of the inflows, thus acting similar to a Tobin tax (Ocampo and Tovar, this volume). The authors find that the deposit system has made the costs of short–term inflows prohibitive and increased the costs of longer–term borrowing. Further, they find that controls were effective in both reducing the amount of capital inflows and in determining the term structure of private foreign debt.

Chile has responded to capital inflows, from 1991 on, with rising reserve requirements (now at 30 per cent), gradually extended to all foreign financial investments into the country. Since the period during which the deposit has to be maintained with the Central Bank was raised in 1992 to one year regardless of the maturity of the inflow, the reserve requirements have implicitly taxed short–term inflows at the highest rate (Agosin and Ffrench–Davis, 1996). Agosin (this volume) shows that this helped favour FDI inflows and discourage transitory inflows.

Both Chile and Colombia have widened existing exchange–rate bands and allowed discreet revaluation of the central parity rate both to cope with large capital inflows and to accommodate productivity–based real appreciation. In some cases, the authorities intervened intramarginally to introduce "noise" into the nominal exchange rate, if the rate was perceived as too stable. The aim of increasing the band width and of intramarginal intervention was to discourage speculative capital inflows by raising the exchange rate risk premium for investors seeking to exploit nominal interest rate differentials. The exchange rate regime in Chile and Colombia, in contrast with Argentina and Mexico where the Convertibility Law or heavy intramarginal intervention to stabilise the dollar parity encouraged short–term inflows, has thus operated in tandem with capital controls to influence the size and structure of capital inflows.

Policy Conclusions

How can developing countries secure the large benefits of foreign capital inflows without incurring unnecessary crises? This book recalls first principles in answering that question: ultimately, capital inflows have to be invested efficiently to underpin

future long–term growth. Since they must eventually be serviced by net exports, policies should be formulated to guide them into exportables. Clear evidence that these principles materialised have been visible for Chile and, to a certain degree, for Colombia among the sample countries.

Market incompletenesses or distortions have led in other cases to financial crisis, crowding out of domestic savings, low capital formation or too much construction, and unsustainable supply–led appreciation and deficit on current account. The policy design emerges as a crucial variable in shaping the outcome.

At the early stages of reform, Argentina, Brazil, Mexico and Peru testify to the great rewards of beating hyperinflation. Inflation has the capacity to distort a wide variety of economic transactions, for example, through interactions between inflation and taxation, the effects of inflation on uncertainty, and its effects on capital accumulation, productivity enhancement and growth. The effects of stabilisation policies can be sped up, with the help of foreign capital, by replenishing foreign exchange reserves that allow anchoring inflation expectations through exchange–rate based stabilisation plans, as stressed by Carneiro. Privatisation programmes help unlock foreign investment by reversing the "wait and see" attitude of foreign investors mindful of the costs of past policy instability.

To sustain the early success, though, requires a balanced macroeconomic policy framework which emphasises export competitiveness as much as price stability and which displays a strong, visible and credible commitment to long–run growth. Prolonged exchange rate based stabilisation and a too rapid pace of disinflation have regularly produced overvalued exchange rates. Avoiding real overvaluation means minimising distorted price incentives which would induce inflows into consumption and the wrong investments, such as in real estate booms.

The case studies clearly support the view that it is crucial to discourage excessive inflows to avoid that sharply (but only temporarily) appreciating exchange rates and rising financial–asset prices encourage consumption and non–tradables investment. Two mutually reinforcing policies can do the trick. First, keep nominal exchange rates flexible enough, and even introduce noise through central bank intervention if they are on a too stable appreciating trend. Managed flexibility raises the currency risk for short–term investors chasing high local returns. Second, discourage excessive inflows by an implicit tax that varies inversely with maturity. There is strong evidence that policy management can impact strongly on the composition and also overall size of flows. This is important because reducing the size of flows will contain real appreciation and the relative decline in the profitability of tradables. Biasing the composition of flows towards FDI will stimulate investment response and reduce volatility.

In the past, Latin American financial systems could be characterised as bank–dominated, low–confidence systems with low saving rates. Recent reforms have increased confidence in domestic financial systems which has been reflected in a large rise of financial savings placed in Latin America. However, notwithstanding earlier theories that predicted a positive savings response to deregulated (typically higher) interest rates and financial deepening, financial reform in Latin America has, as in

many OECD countries, resulted in a drop of private saving rates. A significant share of financial savings has been intermediated towards consumption and investment in existing assets such as real estate and equities. The creation of channels for long–term financing to new productive ventures and medium and small firms has lagged.

We have learned, meanwhile, that savings–enhancing financial reform has to avoid the rise of excessive risk taking in the banking system, spread through time the removal of liquidity constraints and reduce the transaction costs for low–income savers to access profitable savings instruments. The pace of financial reform should therefore not exceed a country's capacity to build appropriate institutions that supervise credit and other financial risks within a newly established framework of prudential regulation (ECLAC, 1995, ch. XII). Comprehensive monitoring of consumer lending, higher bank capitalisation ratios, tight credit lines for mortgage lending, the credible removal of bank deposit insurance and the enforcement of bankruptcy claims against ailing debtors should help avoid substantial expansion in consumption, mortgage and high–risk corporate lending. To tilt the balance of financial reform further towards raising the national saving rate, a dense network of accessible financial institutions, such as the postal savings banks common in many East Asian countries or public savings institutions as in continental Europe should be seriously considered. Such institutions would help to raise the confidence of low–income savers that they can expect reliable and decent returns for thrift. On the other side of the equation, efforts must be directed to complete the supply side of the market by enhancing the availability of long–term financing for productive investment.

To attain dynamic economic growth, both a high rate of investment and improvements in productivity are needed, since these two factors strengthen each other. During the 1980s and early 1990s most of the countries of the region operated far below their production frontiers. Actually, the underuse of capacity reduced the effective productivity of capital and this discouraged gross capital formation associated with the level of domestic demand and its stability.

Strengthening the investment ratio requires that investors face expectations of dynamic stability of aggregate demand and macroeconomic prices. Their proximity to sustainable equilibrium levels would increase productive capacity and facilitate entry into a virtuous circle, leading to systemic competitiveness. Thus, avoiding outlier interest rates and exchange rates as well as surges in financial inflows that crowd out domestic savings and destabilise aggregate demand by increasing it beyond sustainable levels, can help to generate a macroeconomic environment suitable to improved investment performance in the region.

The performance of Chile is illustrative in this respect. Chile has managed to keep aggregate demand close to its production frontier in the 1990s. Its rate of gross capital formation gradually accelerated and in 1993–97 it has been significantly higher than at any other period. This notable progress, apart from its association with the country's capacity to reach social and political agreements, seems due to a substantial change in macroeconomic policies, which have become deliberately active in the areas of monetary policy, sterilising intervention, prudential supervision, exchange rate management and regulation of capital movements.

In brief, reconciling the levels of aggregate demand and supply, attaining a suitable mix between tradables and non–tradables, and avoiding outlier macroeconomic relative prices, such as interest rates and exchange rates, are key variables for attaining lasting macroeconomic balances. Capital formation and the effective productivity of that capital are vitally dependent on the quality of those balances.

Notes

1. Consumers and financial asset markets tend to react faster than productive investors to released liquidity constraints. Productive investors tend to have a longer lag before entering into motion and then a longer maturity. Residential and commercial building tends to have a shorter lag than other capital formation and is more prone to investment overshooting.

2. It should be recalled that several LACs were implementing sharp liberalisation of import regimes *pari passu* with exchange rate appreciation. See ECLAC (1995), Ch. V.

3. The analysis of the text refers to FDI in cash, instead of in the form of debt–equity swaps (thus, alleviating external macroeconomic restriction), and allocated to the creation of new productive capacity instead of purchasing existing assets (thus, expanding the productive frontier).

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II

The Relationship between Foreign and National Savings under Financial Liberalisation

Andras Uthoff and Daniel Titelman

ABSTRACT

This chapter explores the determinants of national savings under financial liberalisation. The econometric analysis shows evidence that external savings crowd out national savings. The chapter argues that the degree of substitution between the two depends to a large extent on the nature of capital inflows. Policies should try to avoid inflows which generate atypical values or significant distortions of fundamental macroeconomic variables such as interest and real exchange rates, prices of physical and financial assets and levels of indebtedness. Hence, they should place concern not only on the level of inflows but also on their composition in terms of maturity and relation to real investment. Macroeconomic management as well as financial development are important to promote saving under increasing capital mobility.

The empirical results also show a low response of national savings to income growth. This implies that growth is a necessary but not sufficient condition to raise savings. Incorporating the investment rate into the econometric model reveals a positive and significant coefficient, suggesting that raising investment will have positive effects on saving rates, either directly or through its effect on growth.

Introduction

Recent crises in the region have made it evident that levels of national saving must be taken into account in macroeconomic policy design, for at least three reasons. First, although it is not easy to determine causality, a significant relationship prevails between national saving and the sustainability of economic growth. Second, external vulnerability relates inversely to the level of national saving. Third, with savings growing, the economic authorities can better stabilise prices while maintaining competitive exchange rates.

McKinnon (1973) and Shaw (1973) anticipated that deregulation and financial liberalisation would lead to significantly higher levels of national saving. Most of the countries of the region have made considerable progress in financial liberalisation and the deregulation of most prices — but despite these reforms, the average rate of national saving in the region has remained close to its historical level of 20 per cent of GDP, with an evident tendency for foreign savings to crowd out national savings. This suggests that financial deepening accompanied by an inflow of external savings does not suffice to raise saving rates and sometimes may operate in the opposite direction. Instead, financial instruments and institutions must develop to facilitate a close relationship between the growth of income and national saving rates on the one hand and, on the other, to strengthen complementarity (rather than substitution) between national and external savings. This becomes all the more necessary because of economic growth's limited impact on the generation of national savings in the countries of the region.

The first section below presents some stylised facts on regional trends in national savings. The second discusses the factors that determine savings and the third presents findings from econometric analyses. We then consider policy alternatives for strengthening saving and conclude with a summary of the main findings and the policies discussed.

Trends in National Saving

National saving in the Latin American and Caribbean countries has five main characteristics, namely: *i)* the rate of national saving at current prices has stabilised at around 20 per cent of GDP; *ii)* external savings have tended to crowd out national savings; *iii)* public saving tends to increase total savings but to a certain extent replaces private saving; *iv)* the relationship between savings effort (measured as the national saving coefficient at current prices) and its result (measured as the investment coefficient at constant prices) depends on the relative price of investment, which is very sensitive

to the evolution of the exchange rate in economies where imported capital goods hold a high share of capital formation (Held and Uthoff, 1995); and *v)* with the exception of Chile's recent experience, no country has succeeded in achieving a virtuous cycle of growth, investment and saving.

Gross national saving as a percentage of GDP remained relatively stable during 1974–81, when high international liquidity allowed access to external financing through bank debt[1]. It dropped sharply as a result of the foreign debt crisis and then rose with the recovery of per capita income. This upward trend broke in the early 1990s, however, when the countries of the region regained access to external capital. Since then, national saving ratios have tended to fall while external savings began to rise (Table 2.1 and Figure 2.1). During the 1990s, the investment coefficient at current prices has remained practically stable at 21 per cent of GDP. In constant (1980) prices it has fluctuated considerably but did recover from 16.3 per cent in 1990–91 to 18.1 per cent in 1992–93 and 18.5 per cent in 1994. The effects of substantial exchange rate appreciations on the evolution of relative investment prices have had a positive influence. Nevertheless, the coefficient remains far below its average of 24 per cent of GDP in 1974–81 (Table 2.1)[2].

Table 2.1. **Latin America and the Caribbean: Savings and Capital Formation Indicators**
(as percentages of GDP)

Period	y° (1980 dollars)	GNS	FS	GDI	GDI°	PGDI PGDP
1970-73	1 385	18.8	2.1	20.9	18.0	1.16
1974-75	1 647	20.9	3.2	24.1	24.9	0.97
1976-79	1 809	20.4	3.5	23.9	24.0	1.00
1980-81	1 967	20.7	4.3	24.9	24.5	1.02
1982	1 821	17.8	4.9	22.6	20.8	1.09
1983-86	1 757	18.7	0.3	19.0	16.7	1.14
1987-89	1 808	22.4	0.5	22.8	17.4	1.31
1990-91	1 786	20.0	0.9	20.8	16.3	1.28
1992-93	1 793	18.5	2.7	21.1	18.1	1.17
1994	1 762	18.4	2.7	21.1	18.5	1.14

Definitions: y° = (GNY°/N); GNS = (GNY-C); FS = (X-M-NFP+NT); GDI = GNS+FS; GDI° = GDI/(PGDI/PGDP). The sign ° indicates constant prices; y° = per capita income; GNS = gross national saving; FS = foreign saving; GDI = gross domestic investment; PGDI = deflator of gross domestic investment, PGDP = GDP deflator; N = population; GNY°= gross national real income, GNY = gross national income; M = imports; X = exports; NFP = net factor payments; NT = net unrequited transfers.

Source: ECLAC, based on official figures for 15 countries (Brazil, Colombia, Costa Rica, Chile, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela).

Figure 2.1. **Stylized Facts on Gross National and Foreign Savings**

Gross National Savings
Percentage of GDP (Current Prices)

Gross National (left scale) and Foreign Savings (right scale)
Percentage of GDP (Current Prices)

Sample: Brazil, Colombia, Costa Rica, Chile, Dominican Republic, Ecuador, El Salvador,
Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela.
Source: ECLAC, on the basis of national accounts statistics weighted by each country's
share of the regional GDP.

Determinants of Saving

The data thus show that it has not yet been possible to encourage saving and capital accumulation to a point consistent with high and sustainable growth rates. Yet most countries have implemented economic reforms geared towards privatising production, opening to the international economy and liberalising markets. This contrast prompts increasing concern with the need to identify the factors that determine national saving. Traditionally, different theories have identified three groups of variables involved in savings functions[3]. Some deal with the relationships among savings, economic growth and income (either permanent or transitory); others reflect the impact

of financial variables (particularly interest rates and financial intermediation) on the generation of savings; and the third group includes more structural factors, including demographic characteristics. More recent empirical studies have sought to discover how economic and political stability affect trends in savings, using indicators that go beyond the inflation rate and take into account political stability, political assassinations, lack of public safety, etc[4]. Analyses of savings functions have also included the relationship between national and external savings and, in some cases, that between private and public saving. One recent argument holds that saving follows investment and hence investment should be included as a variable in the saving function. Recent evidence shows mixed results for causality, depending on the countries considered (Stiglitz and Uy, 1996).

To describe the performance of national saving empirically is not easy. The difficulties arise because national saving, estimated on the basis of national accounts, emerges as a residual; this generates "noise" in its measurement. Moreover, saving decisions are fundamentally intertemporal, made in face of uncertainty. Difficult to incorporate into an econometric model, this variable depends on, among other things, fluctuations in economic activity; institutional development (particularly in social security and financial systems), access of economic agents to financial instruments and private insurance, and disposable income above the subsistence level (Deaton, 1989).

Nevertheless, different studies of the determinants of saving bring to light some interesting points: *i)* no consensus exists on the relative importance of variables such as interest rates, intermediation indicators and/or financial deepening[5]; *ii)* it is hard to determine the causal relationship between income and saving, notwithstanding a usually positive correlation between the savings coefficient and income levels[6]; *iii)* demographic variables and the degrees of uncertainty are usually significant; *iv)* in Latin America, a negative correlation has predominated between foreign savings and national savings; and *v)* there is a negative correlation between public and private savings[7]. For the Latin American economies, studies become complicated because they try to measure and explain saving performance in contexts of widespread poverty, segmented financial markets with little depth, and macroeconomic circumstances that fluctuate considerably (periods of strong economic reactivation followed by sharp recessive adjustments). Given this framework, national saving performance quite likely will differ from that expected in traditional models of intertemporal optimisation[8].

Our econometric estimates of the national savings function, included several of the variables used in the studies reviewed above in the regression equation. In particular, they extended the model estimated in Schmidt-Hebbel, Webb and Corsetti (1992) to ascertain whether national saving is affected when foreign savings deviates significantly from its trend. The equation estimated the following linear function[9]:

$$S / Y_{tk} = \alpha_0 + \alpha_1 YT_{tk} + \alpha_2 DYT_{tk} + \alpha_3 CREC_{tk}$$
$$+ \alpha_4 INFL_{tk} + \alpha_5 RDD_{tk} + \alpha_6 FST_{tk} + \alpha_7 DFST_{tk} + \alpha_8 IR_{tk}$$

The subscript *tk* means a country *k* in period *t*. *S/Y* denotes national savings as a share of GDP, *YT* means the trend in per capita income, *DYT* refers to deviations of per capita income with respect to the trend and *CREC* indicates the growth rate of per capita income. *INFL* represents the rate of inflation, *RDD* the demographic dependency ratio (population under 15 years plus those above 65 years old divided by the population between 15 and 65 years old), *FST* the external savings trend, *DFST* the deviation of external savings from the trend, and *IR* the real interest rate.

As in other studies, and consistent with forecasts using Keynesian or post-Keynesian models, the model predicts a positive relationship between savings and per capita income. The effect on savings of deviations of income from its trend will depend on how such deviations are internalised by economic agents. If they perceive deviations as temporary and not affecting permanent income levels, a high positive coefficient between savings and temporary variations in income should appear[10]. The expected impact of income *growth* on the savings rate is ambiguous. The standard approach implies a saving rate rising with income, but the effect could be negative, in line with life-cycle or permanent-income theory. Also ambiguous is the influence of the inflation rate. For households, inflation could encourage the substitution of physical for monetary assets, but insofar as it reflects greater macroeconomic instability it could also lead to larger savings to the extent that it increases the variance of expected real income. The life-cycle theory suggests a negative effect from the dependency ratio, inasmuch as populations with higher percentages of dependants will tend to depress the saving ratio.

The impact of foreign savings on national savings bifurcates into a positive income effect — reflecting an increase in economic activity due to the release of the binding foreign constraint — and a negative substitution effect — which arises mainly from the wealth perceptions associated with the appreciation of physical and financial assets, the fall of prices of tradable goods resulting from the appreciation of the exchange rate and the increased availability of liquidity and domestic credit. Fry (1978), Giovannini (1985), Edwards (1995), and Schmidt-Hebbel *et al.* (1992) found a negative correlation between foreign savings and national savings; Gupta (1987) found a positive relationship. If foreign savings depart from their trend in periods of high international capital inflows, the negative effect on national saving could intensify from pressures towards currency appreciation and expenditure increases.

Results

The estimates covered 15 Latin American and Caribbean countries between 1972 and 1993[11]. Because they mix cross-section and time-series data (using a sample of 330 observations), two alternatives were used, the fixed–effect and random-effect methods. Instrumental variables were employed to solve the problem of simultaneity[12]. In a first set of regressions, the models estimated did not distinguish between the trend of foreign savings and deviations from it. The results are shown in Table 2.2.

The level of per capita income and its rate of growth have a statistically significant, positive effect on national savings. The growth coefficient lies between 0.18 and 0.25, depending on the method used. Notwithstanding the positive correlation, the value of the coefficient suggests that savings respond slowly to growth. For example, if between 1993 and 2000 the growth of per capita real income were 2 per cent, then the national saving rate would rise to 20 per cent from 18.5 per cent in 1992–93[13].

Table 2.2. **Econometric Results: the Basic Model**

	Cons	Per capita income		Inflation	Growth	Dependency ratio	Foreign savings	R²
		Logarithm of the trend	Logarithm of deviation from trend					
1. Fixed effect	-	0.061 (2.3)	0.163 (9.7)	0.0010 (2.6)	0.20 (4.9)	0.02 (0.9)	-0.47 (-10.5)	0.70
2. Random effect	0.21 (2.4)	0.046 (5.0)	0.173 (4.3)	0.0015 (3.6)	0.18 (3.3)	0.08 (2.6)	-0.47 (-7.9)	0.43
3. Fixed effect with instrumental variables	-	0.066 (2.4)	0.145 (8.5)	0.0014 (3.5)	0.25 (5.6)	0.03 (1.0)	-0.48 (10.5)	0.70
4. Random effect with instrumental variables	0.22 (2.5)	0.046 (5.1)	0.156 (3.9)	0.0018 (5.2)	0.22 (4.1)	0.08 (2.7)	-0.47 (-8.2)	0.44

Independent variables (header spanning)

The variable that measures the effect of cyclical income deviations on savings was significant in all the estimated models, with an average value of 0.16, quite different from the unit coefficient suggested by permanent-income theories (this finding resembles that obtained by Schmidt–Hebbel, Webb and Corsetti, 1992). Two factors explain this result. First, the economies of the region frequently face liquidity or credit restrictions. Under such circumstances, consumption will reflect the temporary fluctuations of income and become extremely sensitive to it (Flavin, 1981; Hall and Mishkin, 1982). Second, the strong reaction of consumption to these temporary variations of income may reflect a situation of "repressed consumption". Given the low levels of per capita income in the region, especially during the 1980s, any increase in income tends to be used to raise consumption.

The estimate for the inflation rate indicates its perception as an indicator of instability that can affect the variability of expected real income. In all the estimates, it had a significant and positive impact on savings, although the value of the coefficient was small.

The estimates confirmed the negative relationship between external and national savings. In the four models, a highly significant coefficient of –0.47 emerged. This finding may reflect that the substitution effect prevails over the income effect in the

Latin American countries. To the extent that the creation of productive assets does not offset inflows of financial capital, a wealth effect tends to emerge as a result of the rapid price increase of existing assets. Thus capital inflows, together with significant exchange rate appreciations, have tended to increase consumption. As a proxy for assessing changes in wealth, the index of securities prices in the stock markets of the seven larger countries of the region shows a fourfold rise in the US dollar equivalent between 1990 and October 1994.

To estimate the potential effect of cyclical variations in external savings on national savings, external savings were divided (as in the case of per capita income) into their trend and the deviations from it. This exercise tried to assess whether heavy capital inflows, which appear as deficits on current account above the average trend (cycles of high external savings), had a different impact on national savings than did the trend evolution of foreign savings. Table 2.3 reports the results, showing the coefficients of both the trend of external savings and of deviations as significant and negative, with values ranging between –0.31 and –0.46 for the trend, and between –0.48 and –0.49 for the deviations. That the coefficient of the deviations is highly significant (t–statistics range between 6.0 and 10.1) suggests that cyclical variations in external savings have a negative impact on national savings. An econometric study of the mechanisms which determine this effect lies beyond the scope of this chapter, but one hypothesis might reflect the idea that heavy capital inflows over short periods of time generate impacts through the exchange rate, affecting asset prices, which strengthen the substitution effect and accentuate the negative ratio between external and national savings. In any event, further research on the significance of the coefficient is needed.

Substitution between national and external savings is sensitive to the macroeconomic context. As Table 2.4 shows, greater declines of national savings have occurred in those countries which, with renewed access to international capital markets during the early 1990s, have allowed substantial excesses in expenditures in relation to national income. Countries such as Costa Rica and Chile, which between 1990 and 1994 increased their disposable national income with relatively moderate deficits on current account (even lower than those they had during the adjustment to the debt crisis of 1983–86) have maintained relatively high levels of national savings. At the other end of the scale are countries (Mexico, Peru and to a lesser extent Argentina) where falling national savings have accompanied substantial increases in foreign savings.

Two additional models were investigated, one including the real interest rate and the other the real investment rate. Given that the interest rate was not significant, Table 2.5 presents the results for the real investment rate[14]. Contrasting approaches can explain the correlation between savings and investment. On the one hand, international capital mobility imperfections, interest rate differentials across countries and demographic and technological factors predict that domestic savings and investment should have a positive correlation in the long term. On the other, arguments which highlight the relative lack of financial intermediation (which justifies the link between corporate investment and retained earnings) explain the saving/investment correlation

Table 2.3. **Basic Model Plus Differentiating Foreign Saving between Trend and Cycle**

| | Cons. | Independent Variables | | | | | | | R² |
| | | Per capita income | | Inflation | Growth | Dependency ratio | Foreign savings | | |
		Logarithm of the trend	Logarithm of deviation from the trend				Trend (% GDP)	Deviation from the trend	
1) Fixed effect	-	0.063 (2.5)	0.142 (9.0)	0.0010 (2.4)	0.20 (4.8)	0.001 (0.4)	-0.31 (2.3)	-0.48 (7.2)	0.67
2) Random effect	0.26 (3.2)	0.051 (5.8)	0.148 (3.8)	0.0015 (3.5)	0.17 (3.0)	0.10 (3.1)	-0.46 (4.6)	-0.49 (6.0)	0.40
3) Fixed effect with instrumental variables	-	0.064 (2.4)	0.145 (8.4)	0.0014 (3.5)	0.25 (5.6)	0.02 (0.51)	-0.33 (2.5)	-0.49 (10.1)	0.69
4) Random effect with instrumental variables	0.23 (2.7)	0.048 (5.4)	0.156 (3.8)	0.0019 (5.3)	0.22 (4.1)	0.08 (2.7)	-0.44 (4.4)	-0.48 (6.4)	0.43

Countries: Brazil, Colombia, Costa Rica, Chile, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Dominican Republic, Uruguay and Venezuela.

Sample: 1972-93 (330 Observations).

based on domestic financial market imperfections. In Table 2.5, the coefficient on real investment appears as statistically significant (in all cases with t statistics within the range of 9.9 to 10.7) and positive. Introducing this variable weakens the effect of growth on savings, reflecting some collinearity between them because the investment rate affects growth. Although the causality among these variables remains difficult to single out, the certain implication of the results concerns the need for policies to enforce the interlinkages among these variables by creating an adequate macroeconomic and institutional framework for allocating financial savings to real investment.

Table 2.4. **Savings and Total Gross Domestic Investment**
(Per cent of GDP)

	1983-90	1992-94	Diff.
Argentina			
National savings[a]	15.2	15.0	-0.2
Foreign savings[a]	1.8	3.4	1.6
Gross domestic investment[b]	16.3	20.2	3.9
Brazil			
National savings[a]	21.0	20.5	-0.5
Foreign savings[a]	0.7	-0.4	-1.1
Gross domestic investment[b]	17.0	13.8	-3.2
Chile			
National savings[a]	14.7	23.8	9.1
Foreign savings[a]	5.3	2.7	-2.6
Gross domestic investment[b]	15.8	20.7	3.4
Colombia			
National savings[a]	19.4	18.7	-0.7
Foreign savings[a]	0.2	-0.1	-0.3
Gross domestic investment[b]	17.3	20.7	3.4
Costa Rica			
National savings[a]	17.7	22.1	4.4
Foreign savings[a]	7.8	6.8	-1.0
Gross domestic investment[b]	21.3	24.0	2.7
Mexico			
National savings[a]	20.9	15.7	-5.2
Foreign savings[a]	-0.5	6.9	7.4
Gross domestic investment[b]	17.2	21.6	4.4
Peru			
National savings[a]	20.7	17.1	-3.6
Foreign savings[a]	1.8	5.0	3.2
Gross domestic investment[b]	19.1	23.5	4.4
Latin America (19 countries)			
National savings[a]	19.5	17.7	-1.7
Foreign savings[a]	0.7	2.7	2.0
Gross domestic investment[b]	16.8	18.1	1.2

a.   At current prices.
b.   At constant prices.
Source: ECLAC with data supplied by IMF and the countries.

Table 2.5. **Basic Model Plus Investment Rate**

	Cons.	Independent Variables							R²
		Per capita income		Inflation	Growth	Dependency ratio	External savings	Real investment ratio	
		Logarithm of the trend	Logarithm of deviation from the trend						
1) Fixed effect	-	0.051 (2.2)	0.024 (1.26)	0.0008 (2.52)	0.099 (2.63)	0.014 (0.54)	-0.734 (16.02)	-0.518 (10.67)	0.77
2) Random effect	-0.21 (2.28)	0.034 (3.3)	0.011 (0.29)	0.0010 (1.88)	0.040 (0.93)	0.041 (1.10)	-0.775 (15.07)	-0.674 (10.54)	0.66
3) Fixed effect with instrumental variables		0.055 (2.4)	0.017 (0.90)	0.0011 (3.09)	0.131 (3.31)	0.015 (0.59)	-0.729 (15.98)	-0.508 (10.50)	0.78
4) Random effect with instrumental variables	-0.22 (2.29)	0.035 (3.24)	-0.015 (0.40)	0.0012 (2.20)	0.067 (1.42)	0.042 (1.13)	-0.773 (14.94)	-0.668 (9.88)	0.66

Countries: Brazil, Colombia, Costa Rica, Chile, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela.
Sample: 1972-93 (330 Observations).

(Percentages of GDP)

Countries	Growth of GDP			National savings rate			Domestic investment rate		
	1980-84	1985-89	1990-94	1980-84	1985-89	1990-94	1980-84	1985-89	1990-94
Thailand	5.5	9.0	8.8	22.8	27.6	34.4	29.0	29.9	41.2
Malaysia	6.9	4.7	8.6	26.4	28.3	29.5	34.8	26.3	34.5
Singapore	8.5	6.0	8.3	39.9	41.8	48.2	47.4	38.3	40.6
Republic of Korea	6.6	9.5	7.5	23.9	34.1	35.3	29.9	30.6	36.7
Indonesia	6.2	5.3	6.8	27.3	27.9	28.3	27.3	30.9	30.4
Average (simple)	6.7	6.9	8.0	28.1	31.9	35.2	33.7	31.2	36.7
Papua New Guinea[b]	-0.4	2.8	8.2	2.9	5.9	11.6	28.2	22.1	23.9
Sri Lanka	5.3	3.1	5.4	16.3	14.3	17.8	29.1	22.7	23.8
Pakistan	6.8	6.4	5.1	20.1	23.2	19.4	18.7	18.6	19.8
Bangladesh	3.1	3.4	4.7	5.0	6.2	9.6	14.3	12.7	13.0
India	5.6	6.2	3.9	20.4	21.8	22.8	22.1	24.6	24.4
Fiji	1.5	2.2	2.5	17.2	14.8	12.3	26.3	16.4	14.3
Philippines	1.3	2.7	1.8	22.4	18.3	19.8	27.2	17.8	23.0
Average (simple)	3.3	3.8	4.5	14.9	14.9	15.4	23.7	19.3	19.2
Brazil	1.7	4.4	1.0	17.5	22.7	19.6	21.4	23.0	19.6
Colombia	2.7	4.8	4.0	16.3	20.7	19.5	19.8	19.8	18.8
Costa Rica	0.3	3.8	4.6	13.4	18.8	21.8	25.4	25.9	27.8
Chile	0.8	6.1	6.2	7.1	16.5	23.2	16.6	21.3	25.3
Ecuador	2.2	2.2	3.3	17.1	13.4	18.0	21.9	20.8	20.2
El Salvador	-4.6	0.4	4.9	10.3	12.9	14.6	12.9	12.9	17.2
Guatemala	-0.2	2.2	3.8	9.7	8.5	11.1	13.9	12.6	15.8
Honduras	1.1	3.9	2.6	8.7	13.6	22.1	18.2	17.7	28.4
Mexico	3.4	1.1	3.0	22.6	20.9	17.1	23.6	20.9	22.5
Panama	4.7	0.6	5.4	15.5	11.5	13.0	25.4	13.5	22.4
Paraguay	3.9	4.2	2.8	19.5	20.0	13.5	25.5	24.1	23.4
Peru	0.4	-0.2	2.9	22.3	20.4	18.6	27.2	22.7	21.3
Dominican Rep.	3.9	3.7	1.7	13.1	21.7	20.1	21.1	22.9	23.0
Uruguay	-1.7	-3.9	3.9	10.4	12.5	13.3	14.7	12.3	13.4
Venezuela	-3.1	1.7	3.9	25.1	20.4	19.6	20.6	20.9	16.9
Average (simple)	1.0	2.9	3.6	15.2	17.0	17.7	20.5	19.4	21.1
Average (weighted)	1.5	2.9	2.5	19.1	21.2	18.6	21.8	21.8	20.6

a.   Savings and investment ratios are defined at current prices.
b.   1990-93.

Policy Implications

Savings for Sustained Growth

The slow response of national savings to the growth of national income has important implications for the region. Unlike the East Asian countries that have managed to consolidate growth rates of over 7 per cent based on saving and investment rates of over 30 per cent of GDP, the Latin American countries have not been able to consolidate a vigorous virtuous circle of rising income, savings and investment. To make growth an important determinant of savings, policies must promote financial development to increase the elasticity of savings to income growth. Past performance has weakened the argument that growth automatically triggers savings[15].

During the 1980s and early 1990s, the Latin American countries have had growth rates less than half of those in the successful Asia and Pacific countries and lower even than in the less successful countries (Table 2.6). The Asian and Pacific countries with the highest growth rates also have high national saving rates; some also show high foreign savings with little crowding out. This suggests that, however difficult the task of finding causality between growth and savings empirically, the two phenomena can and should go hand in hand. It belies the evidence from Latin America, where corresponding, proportional increases in savings have not accompanied the recovery of growth rates. The successful Asian countries have maintained stable macroeconomic environments with aggregate demand close to productive capacity and credible macroeconomic prices — especially the real exchange rate and the real interest rate. They have developed the financial institutions necessary to mobilise savings and promote investment. They also have high domestic investment rates, an average of 37 per cent of GDP for the first group of countries in Table 2.6 compared to 21 per cent for Latin American countries. Because, as we have argued, causality among savings, investment and growth can follow different patterns, their moving together strengthens the emerging agreement on the need to create a virtuous cycle among them.

Substitution of Savings

The finding of substitution between foreign and national savings has significant policy implications. The vulnerability and instability of the process of accumulation and growth will increase to the extent that a substantial portion of available external funding is used to finance this substitution. The crisis experienced by Mexico in late 1994 offers a recent example of how this happens. Between 1983–90 and 1992–94, foreign savings increased by 7.4 per cent of GDP, and the appreciation of the exchange rate increased capital–goods purchasing power by 2.2 per cent of GDP. As a result, capital formation should have risen by 9.6 per cent of GDP; but it increased by only 4.4 percentage points, because the growth of foreign financing, a domestic lending

boom and the exchange rate appreciation led to an increase in consumption and a drop in national savings, which fell by 5.2 per cent of GDP (Tables 2.4 and 2.7). For Latin America as a whole external savings rose by two per cent of GDP between 1983–90 and 1992–94, while nominal investment grew by only 0.3 percentage points of GDP as national savings dropped by 1.7 points.

The Mexican experience and that of other countries in the region demonstrates the importance of proper macroeconomic management in the presence of heavy capital inflows to reduce substitution between the two types of savings. As Table 2.5 showed, countries like Peru, Mexico and to a lesser extent Argentina that had relatively large current account deficits in the early 1990s also experienced relative declines in domestic savings. Macroeconomic policy must gear towards maintaining a balance between increased expenditure and income growth as well as between consumption and investment. To achieve these objectives, it should use foreign exchange and monetary measures that influence arbitrage conditions, making them consistent with the desired level and composition of demand. It must ensure that these conditions, which affect international capital flows, do not generate undesired changes in demand with their negative effects on national savings and the sustainability of economic activity.

Table 2.7. **Mexico: Sources of Total Savings, 1987-94**

(As per cent of GDP)

	PUB (1)	PRIV (2)	NAT (3)	FOREIGN (4)
1987	7.0	15.3	22.3	-3.1
1988	1.4	18.3	19.7	1.4
1989	3.1	16.3	19.4	2.8
1990	6.6	13.2	19.8	3.0
1991	7.4	10.9	18.3	5.1
1992	6.6	10.4	17.0	7.4
1993	5.0	11.8	16.8	6.3
1994	3.7	12.1	15.8	7.7

(1)   Public Savings as a percentage of GDP at current prices (Bank of Mexico, INEGI, Secretariat of Finance). Operational approach.

(2)   Private Savings as a percentage of GDP at current prices (Bank of Mexico, INEGI, Secretariat of Finance). Operational approach.

(3)   National Savings as a percentage of GDP at current prices (1) + (2).

(4)   External Savings as a percentage of GDP at current prices (Bank of Mexico, INEGI, Secretariat of Finance). Operational approach. Equivalent to Negative Balance on Current Account.

Source: Moreno Brid (1995).

Summary and Conclusions

Empirical analyses of saving in Latin America respond to the following stylised facts. Over the last 25 years, the share of national savings has stabilised at 20 per cent of GDP, with a tendency for foreign savings to crowd out national savings. The evolution of relative prices of investment, closely linked to the exchange rate given the high share of imported capital goods, has governed the relationship between national savings and real gross domestic investment. In this context, econometric analysis of the relationship between national savings and income levels and growth, foreign savings, inflation, real interest rates and demographic dependency ratios brings to light three key facts.

— *First*, notwithstanding a significant positive relationship between national savings as a share of GDP and the rate of growth of per capita income, the estimated coefficient of around 0.22 shows little impact on savings. This identifies growth as a necessary but not sufficient condition to raise savings to the levels required to support growth rates similar to those of the Asian and Pacific countries; it weakens the idea of relying solely on growth to increase savings. Policies to complement the positive effect of economic growth on savings should consolidate a stable macroeconomic and institutional framework, promote real investment and reform tax systems to encourage firms to reinvest profits.

— *Second*, a negative relationship between external and national savings, with the estimated coefficient significant at a value of around –0.47, suggests a significant trade–off between the two sources of investment financing.

— *Third*, the investment rate showed a positive and significant coefficient, suggesting that (independently of causality) raising investment will have positive effects on saving rates, either directly or through its effect on growth.

The experience of the countries of the region shows that the degree of substitution between external and national savings depends to a large extent on capital inflows that produce atypical values or significant distortions of fundamental macroeconomic variables such as interest rates, real exchange rates, prices of physical and financial assets and levels of indebtedness. Experience also shows that not only the level of inflows matters but also their composition in terms of maturity and relation to real investment. Hence, both macroeconomic management and financial development are important to promote saving under conditions of increasing capital mobility.

Notes

1. Foreign savings are defined as the negative balance on current account, i.e. net capital inflows minus reserves reserves accumulated in the accounting period.

2. Fluctuations in the financial markets, such as that in Mexico in 1994 (the "tequila effect"), have brought about significant currency devaluations and thus generated changes in the relative price of investment as well as in the investment coefficient at constant prices.

3. For excellent reviews of the literature, see Deaton (1989), Gersovitz (1988), and Stiglitz and Uy (1996).

4. Empirical studies based on different hypotheses for assessing factors that determine the performance of savings in developing countries may be found in Fry (1978); Edwards (1994; 1995); Schmidt-Hebbel, Webb and Corsetti (1992); Giovannini (1983; 1985); Corbo and Schmidt-Hebbel (1990); Liang (1982); Gupta (1987); Ocampo, Crane and Farne (1989); and Nam (1989).

5. These variables seem to have different effects in the Latin American and Asian countries (Gupta, 1987).

6. This effect is maintained when the rate of change of income or of GDP is included, although the value and significance of the parameter may vary.

7. Edwards (1995) estimates a substitution coefficient between the two of around 0.5.

8. For a discussion of savings models (or consumption models, the other side of the same coin) in a context of intertemporal optimisation, see Deaton (1992).

9. Following the recommendations from recent studies (Schmidt-Hebbel, Servén and Solimano 1996), the model was also estimated including the level of real investment (as a percentage of GDP).

10. This would be the performance expected under the assumptions traditionally used in models of intertemporal optimisation of consumption. In the extreme case, the value of this coefficient should be equal to one when permanent income is not affected.

11. The countries covered were Brazil, Colombia, Costa Rica, Chile, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela. Due to data problems in some of the countries, the regression analysis only covers 1972-93. There was a trade-off between updating the period covered and the number of countries included.

12.   The variable considered as being simultaneously determined with savings is the growth rate. The instruments used were the demographic dependency ratio, lagged growth, liquidity (M1/GDP), percentage of domestic credit to the private sector, public savings, lagged foreign savings, level of per capita income, government consumption, lagged investment, inflation, export growth, population growth and share of urban population.

13.   In this exercise, the following assumptions are made: a one-digit average inflation rate, an external savings rate equivalent to 2 per cent of GDP, and a per capita GDP growth rate of 2 per cent.

14.   To incorporate the real interest rate into the regressions, and given the limited information available, the sample had to be reduced to seven countries (Brazil, Chile, Ecuador, El Salvador, Mexico, Uruguay and Venezuela), and limited to the period 1975-93. The findings do not give sufficient grounds to say that the interest rate had a significant effect on national savings in the sample of countries analysed.

15.   For instance, Gavin, Haussman and Talvi (1996) argue that policy makers should worry only about growth issues and saving will spontaneously follow.

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III

Capital Flows and Investment Performance in Argentina

Roberto Frenkel, José María Fanelli and Carlos Bonvecchi

ABSTRACT

The Convertibility Plan launched in 1991 curbed inflation and induced a reversal in the evolution of aggregate investment. The crisis triggered by the Mexican devaluation in December 1994, however, showed that some of the positive results in macroeconomic stability and investment might not be as robust as necessary to ensure the long–run sustainability of growth.

The good results related closely to capital inflows. The analysis shows a clear positive association between the recovery of such inflows in the 1990s and the reversal of the falling trend in the investment rate which had afflicted the economy in the 1980s. The reversal of capital inflows which occurred after the Tequila shock also clearly coincided with a fall in investment.

The chapter presents some hypotheses and stylised facts regarding the channels and the economic behaviour which create the association between investment and capital inflows. *First*, in Argentina an important indirect channel connected capital inflows with investment demand *via* the effects of inflows on the macroeconomic environment, by relaxing the external constraint. The availability of foreign financing permitted maintenance of the nominal exchange rate, crucial to disinflate the economy, despite significant real appreciation and a rising trade deficit. Increased price stability encouraged investment *via* the reduction in macroeconomic uncertainty which favoured animal spirits; by inducing a significant increase in the demand for domestic financial assets which relaxed the extreme credit constraint firms underwent in the 1980s; and by the recovery of aggregate demand triggered by the stabilisation of the economy.

Second, in addition to the obvious fact that foreign direct investment is part of capital inflows, changes in the supply of foreign financing relax the severity of the credit rationing faced by firms. In Argentina, under the convertibility rule and *dollarisation*, the supply of credit to firms and consumers is extremely dependent on capital inflows.

Third, despite structural reforms (particularly the opening of the capital account), the evolution of aggregate demand remains a crucial determinant of investment demand. This point relates to the sustainability of the growth path followed in the 1990s. The behaviour of domestic savings in the expansionary and contractionary phases suggests that macroeconomic policy implemented in the 1990s led to a low rate of domestic savings. Under these circumstances, investment rates could not rise without increasing the economy's dependence on foreign savings.

Introduction

The debt crisis at the beginning of the 1980s and the failure of the stabilisation policies launched in the following years produced a progressive worsening in the macroeconomic environment, which ultimately led to the 1989/90 hyperinflation. To overcome this situation, the government launched the so–called Convertibility Plan in March/April 1991; still under way, it has proven much more successful in curbing inflation than the stabilisation packages of the 1980s. The programme also succeeded in inducing a reversal in the evolution of aggregate investment. While investment showed a declining trend in the 1980s, between 1991 and 1994 it rose. The crisis triggered by the Mexican devaluation in December 1994, however, showed that some of the positive results for macroeconomic stability and investment might not be robust enough to ensure the long-run sustainability of growth.

Discussion of the soundness of these results has related closely to the issue of capital movements, chiefly because between 1991 and 1994, in the context of easy access to international credit, the economy tended to generate an increasing current account imbalance. In this situation, two issues arose. The first had to do with macroeconomic stability. If the economy depends too heavily on capital inflows (particularly short–term funds) in the short run, a sudden reversal could trigger a liquidity crisis at the macroeconomic level. The second questioned the financial solvency of the growth path the economy followed after the implementation of convertibility. The interruption of capital inflows provoked by the Mexican crisis, which resulted in a marked fall in GDP and investment, confirmed the relevance of these questions.

To evaluate the sustainability of the long–run growth path, the relationship between capital inflows and real investment becomes crucial, because the quantity and quality of the investment financed by inflows will determine the economy's ability to service foreign liabilities in the future. This chapter tries to shed some light on this issue. It focuses on the evolution of real investment under the convertibility regime, to identify the linkages in capital formation between capital inflows and expenditure. The first section describes the most relevant macroeconomic facts of the convertibility period between 1991 and 1995 and analyses the volume and composition of capital inflows. The next presents the main features of the long–run performance of savings and investment, as well as an analysis of the pattern of investment allocation and of the determinants of investment demand. The following section examines the role of financial factors. It focuses on changes in the generation and absorption of financial resources by the most important aggregate sectors and on changes in firms' balance sheets.

Stabilisation, Capital Inflows and Macrodynamics

One can hardly understand the relationship between capital inflows and investment in Argentina in the 1990s without looking at the macroeconomic factors, particularly those related to stabilisation and the implementation of structural reforms such as the opening of the economy and the privatisation of public enterprises.

These factors greatly influenced capital inflows, the trade balance and relative prices, whose evolution, in turn, heavily determined the patterns of investment and savings. The overall surge in flows to Latin America included for Argentina a significant reversal of capital flight.

This section analyses the stylised facts of the aggregate behaviour of the economy in the 1990s. It focuses on the macroeconomic factors most closely related to investment, savings and capital movements. References to the 1980s provide some historical perspective and a standard against which to weigh the changes which followed stabilisation and the revival of capital inflows. The first part examines stabilisation policy. The second analyses capital movements. The third presents the most relevant stylised facts regarding the macrodynamics of the 1990s, especially the characteristics of short–run fluctuations, changes in the external constraint and the evolution of relative prices.

The Convertibility Regime and Stabilisation

The Convertibility Plan aimed drastically to reduce the inflation rate and avoid a speculative attack against foreign reserves which could generate a new hyperinflationary episode[1]. Not a typical adjustment programme, the plan combined stabilisation with a comprehensive set of measures intending to restructure the economy along the lines of the "Washington Consensus". The most influential elements of the reform included the new rules governing monetary policy, the deregulation of both the financial system and the stock market, the opening of the capital and trade accounts, and the privatisation programme. The package also embraced a contractive fiscal and monetary stance together with some measures to de–index the economy. Distinctively, the plan pegged the peso/dollar exchange rate on a one–to–one basis. The Convertibility Law, which required the Central Bank to back all of the monetary base with foreign exchange reserves, established the new parity[2]. In practice, it turned the Central Bank into a Currency Board; a new charter consistent with the new legal and economic policy framework went into effect in September 1992. It gave the monetary authorities full autonomy, prohibited the monetary financing of the fiscal deficit and severely restricted rediscount operations.

On the fiscal front the government made major efforts to reform the tax system and reduce tax evasion, both to increase revenues and gradually to eliminate distortionary taxes. As a consequence, a considerable increase in tax compliance has developed over the years. Reduced inflation boosted the increase in tax collection (the Olivera–Tanzi effect operating in reverse) as did a significant rise in the activity level — although the latter effect partially reversed when aggregate demand fell after the Mexican crisis.

The Convertibility Plan very successfully cut inflation, from 1 344 per cent per year in 1990 to under one per cent in 1996. Greater macroeconomic stability together with the new exchange–rate regime (which markedly curtailed exchange rate risk) improved the "economic climate" perceived by foreign investors and greatly encouraged capital inflows in the first years of the programme. During a significant

period, however, the domestic inflation rate remained higher than the international one; its remarkable drop did not occur sufficiently fast to avoid considerable appreciation of the real exchange rate. The misalignment of relative prices took the form of sizeable increases in the prices of non–tradable *vis–à–vis* tradable goods, average wages and unit costs of production as compared to the rest of the world.

The interaction of these positive and negative factors gave rise to two very different stages in the evolution of the economy. The first occurred between the implementation of the programme and the Mexican crisis of December 1994, which opened the still–developing second stage. The first stage saw great success in GDP growth and financial deepening; the second, on the contrary, showed a deterioration of the macroeconomic scenario and partial reversion of the positive financial developments of the first stage. Table 3.1 shows the evolution of key macroeconomic indicators.

Table 3.1 **Main Macroeconomic Indicators**

	1990	1991	1992	1993	1994	1995[a]
GDP at current prices ($ billion)	67.4	179.7	229.2	259.0	287.4	280.1
Real GDP growth (%)	-1.3	10.5	10.3	6.3	8.5	-4.6
Annual Inflation (CPI)	1 343.9	84.0	17.5	7.4	3.9	1.6
Gross fixed domestic investment at current prices (% of GDP)	13.2	14.3	16.3	18.3	20.2	17.7
National savings at current prices (% of GDP)	15.2	18.8	18.4	14.0	15.0	15.1
Real exchange rate[b]	100.0	75.0	64.2	60.2	59.3	58.4
Real multilateral exchange rate[c]	100.0	83.3	77.5	74.0	78.4	87.0
Current account ($ billion)[d]	1.8	-2.8	-6.8	-8.6	-11.4	-5.5
Capital account ($ billion)	1.0	4.7	9.9	13.1	11.9	5.4
Trade account ($ billion)	8.2	3.7	-2.6	-3.7	-5.7	0.8
Exports ($ billion)	12.2	12.0	12.2	13.1	15.8	21.0
Imports ($ billion)	4.0	8.3	14.9	16.8	21.6	20.1
Reserves ($ billion)	5.8	7.9	11.2	15.3	16.1	16.0
M1/GDP (%)[e]	4.7	4.3	5.2	6.0	6.2	6.2
M3/GDP (%)[e]	8.7	7.1	9.0	11.3	11.5	10.6
M3*/GDP (%)[e] [f]	12.5	10.7	13.7	18.4	19.7	18.9
Total external debt ($ billion)	62.2	65.4	67.6	70.0	77.0	87.0
Non-financ. public sector deficit (% of GDP)	2.9	2.5	0.1	-0.8	0.5	1.4
Primary deficit (% of GDP)	-1.5	-1.7	-2.2	-3.4	-1.0	-0.5
Privatization (cash) (% of GDP)	0.4	1.2	0.8	1.5	0.3	0.4
Primary deficit (excl. privat.) (% of GDP)	-1.1	-0.5	-1.4	-1.9	-0.7	0.1
Unemployment rate[g]	6.3	6.0	7.0	9.3	12.2	16.4

Notes: a. Provisional.
　　　b.　WPI US/CPI Arg.
　　　c.　Weighted CPI of trade partners /CPI Arg. Source: ECLAC.
　　　d.　Excluding the estimation of interest earned on foreign assets by domestic residents.
　　　e.　In December each year.
　　　f.　M3 plus dollar deposits.
　　　g.　In October each year.
Source:　Based on Central Bank and Ministry of Economy data.

The years 1991–94 witnessed a significant expansion in GDP — by 40 per cent — from a base of high idle capacity. Services, durable consumer goods and automobiles led this surge. The drop in inflation and a rapid increase in credit boosted demand for both consumption and capital goods. A sharp deterioration in the trade and current accounts became a counterpart of this important increase in absorption. In contrast with the significant surpluses registered in 1990 and 1991 the trade account showed growing deficits from 1992 to 1994. Fuelled by this disequilibrium, the current account deficit grew continuously to 5.2 per cent of GDP in 1994. Such a disequilibrium could be sustained only by massive capital inflows, so strong that they surpassed the demand for funds stemming from the current account deficit and generated a significant accumulation of foreign exchange reserves. Under the currency board scheme, the accumulation of reserves produced a surge in monetary aggregates and domestic credit. Deepening *dollarisation* of the domestic banking system accompanied the increase in domestic monetary aggregates and gathered momentum after the full equivalence of contracts made in any currency was established. Monetary expansion led to a significant rise in aggregate demand. Given the large disparity between productive capacity and actual GDP, output responded vigorously to that rise, but with a growing external gap.

The Mexican devaluation in December 1994 made clear the extreme danger of depending too heavily on external savings to sustain stability and growth. When the availability of foreign funds plunged after the Mexican crisis, GDP decreased 4.6 per cent in 1995 while unemployment reached a peak of 18.6 per cent in May 1995, with a simultaneous, sharp drop in aggregate investment. The fiscal equilibrium attained after the implementation of the convertibility regime had deteriorated by the time the Mexican shock occurred and this contributed to worsening its effects. Despite a 65 per cent increment in nominal tax revenues over 1991–94, a similar increase in expenditures kept current government savings low. Moreover, the reform of the social security system in mid–1994 diverted towards private pension funds the contributions which had previously financed the public pay–as–you–go system. The reform generated a deficit calculated at around one percentage point of GDP ($2.8 billion) and the non–financial public sector recorded an overall deficit (including privatisation proceeds) in the second half of 1994 for the first time since 1991. Although negligible by international standards, this represented a severe blow to a government which had set out to keep borrowing requirements at zero or less, especially given the new, more adverse situation in the international financial markets.

The abrupt change in expectations provoked by the Mexican devaluation immediately affected the stability of the financial system as it triggered a run against international reserves and bank deposits which generated a plunge in asset prices and sizeable capital outflows[3]. Between December 1994 and May 1995, when total deposits (in both pesos and dollars) hit bottom, the funds withdrawn from the banks amounted to 17.5 per cent of total outstanding deposits. Credit and overdraft facilities were sharply curtailed and firms, whose sales had dropped sharply, could not borrow working capital. The percentage of non–performing loans increased heavily.

The authorities nonetheless have managed to keep financial instability under control. Two pivotal factors attained this result. First, Central Bank policies became much more active than in the recent past; some represented important deviations from the market orthodoxy, as the government actively supported banks by resorting to rediscounts and reductions in the ratio of required reserves. Second, an aid package co–ordinated by the IMF crucially helped to improve expectations. The agreement with the IMF unlocked a substantial $8 billion aid package without which the Convertibility Plan might have collapsed.

Capital Movements in the 1990s[4]

Table 3.2 shows the evolution of the capital account over the last fifteen years from the beginning of the debt crisis. It reveals significant contrasts between the 1980s and the 1990s. First, note the marked increase of inflows as compared to the debt–crisis period. The annual average surplus in the capital account in the 1990s is about three times the average in the 1980s. Second, note the sharp contrast in their composition (the last two columns of the table): compensatory or involuntary financing provided the main source of credit in the 1980s, while in the 1990s almost all capital inflows have been voluntary. The economy demonstrated a systematic tendency to substitute market–determined for compensatory finance between 1991 and 1994. This reflected the change in the international scenario. In the 1990s, the greater supply of funds flowing to "emerging" markets and the fall in international interest rates made Argentine access to market funds much easier. In fact, in 1993, when autonomous capital inflows peaked, net compensatory finance turned negative as the country repaid its outstanding compensatory loans[5]. The most important sources of voluntary funds were trade credit, foreign direct investment (privatisation) and repatriation of capital.

Table 3.2. **Sources and Destination of Capital Inflows, 1981-95**

($ million)

Period	Trade account surplus	Current account deficit	Changes in foreign reserves	Capital account surplus[a]	Compens. capital movements	Autonomous capital movements[a]
1981-85	2 779	2 575	-87	2 488	2 832	-344
1986-90	4 025	1 634	1 907	3 542	2 348	1 194
1991-95	-1 501	7 018	1 991	9 009	-645	9 654
1990	8 275	-1 789	2 751	962	2 072	-1 110
1991	3 703	2 803	1 880	4 683	1 109	3 574
1992	-2 637	6 821	3 104	9 925	898	9 027
1993	-3 666	8 583	4 481	13 064	-7 542	20 606
1994	-5 751	11 386	561	11 947	810	11 137
1995	844	5 496	-69	5 427	1 500	3 927

a. Including errors and omissions.
Source: Based on Central Bank data.

The bulk of capital inflows went to finance the current account disequilibrium. The pronounced recovery of domestic absorption which led to increasing trade account deficits between 1991 and 1994 largely explains the mounting current account deficit. It involved a marked increase in imports together with some stagnation in exports in the first four years of the convertibility regime (before the Mexican crisis). The high rate of import growth came from the sharp recovery of economic activity, the liberalisation of trade and the appreciation of the real exchange rate.

These characteristics of the dynamic path followed by the economy in the first four years of convertibility completely changed after the Mexican devaluation in late 1994. The next year saw large reductions in the current and trade account deficits, impressive features of the post–"Tequila" adjustment of the external sector in Argentina. In just one year, the net trade deficit reversed by over $6 billion, as imports fell and exports increased. Domestic recession induced the import plunge; exports climbed as the terms of trade improved by around 10 per cent and the recovery of domestic demand in Brazil spilled over into Argentina. Exports to Brazil rose from $3.6 billion in 1994 to $5.5 billion in 1995.

The Mexican crisis also changed the composition of capital inflows. The reduced demand for compensatory finance turned around in 1995, when the government had to resort to multilateral agencies to compensate for the voluntary capital outflows. It also needed more funds from the international markets. The increase in flows captured by the public sector nonetheless could not fully compensate for the drop in those to the private sector. As a result, between 1994 and 1995, voluntary capital inflows fell by $7.2 billion while the surplus of the whole capital account declined by $6.5 billion (Table 3.2). This created the need for significant adjustment of the economy.

Table 3.3. **Allocation of Capital Inflows, 1994-95**

($ million)

Quarter	Public sector	Private sector[a]	Capital account surplus[a]	Compens. capital movements	Autonomous capital movements[a]
1994 I	78	2 426	2 997	493	2 504
II	-243	2 657	2 369	-45	2 414
III	419	1 506	2 363	438	1 925
IV	2 413	1 881	4 218	-76	4 294
1995 I	241	-3 088	-3 316	13	-3 329
II	1 319	-345	2 262	1 288	974
III	1 517	-436	1 264	183	1 081
IV	2 830	2 371	5 217	16	5 201

a. Including errors and omissions.
Source: Based on Central Bank data.

The quarterly evolution of capital movements reflected the offsetting behaviour of the government and the changing portfolio decisions of the private sector (Table 3.3). The most important consequences of the Mexican crisis came in the first three quarters of 1995, particularly the first, when the private sector showed a net outflow of $3 billion. The government increased its demand for foreign finance *pari passu* with the fall in private capital inflows, a strategy which seems to have prevented a major balance of payments crisis. In the last quarter of 1995, both the government and private sector capital accounts showed surpluses. Two crucial factors made this strategy viable in the short run: the support of the IMF and the relatively favourable evolution of international capital markets (lower interest rates and the recomposition of flows toward emerging markets) after the Tequila effect.

Short–run Fluctuations, the External Gap and Relative Prices

The short-run fluctuations of aggregate variables in the 1990s both resembled and differed from their patterns in the 1980s. Despite a negative overall trend in activity throughout the 1980s, demand and output followed cyclical paths with phases of about two years (Table 3.4). Expansions occurred in 1983–84 and 1986–87, the first a modest recovery after the strong recession generated by the initial adjustment to the debt crisis and the second following implementation of the Austral Plan in July 1985. These spasmodic macroeconomic dynamics related to the debt crisis but did not originate in it. The economy had displayed similar patterns since the mid–1970s. Over the entire 15 years between 1975 and 1990, domestic policies played a significant role in determining the phases of the cycle; policy shocks led most of the expansionary phases — stabilisation programmes that included using the nominal exchange rate as an anchor for expectations, price decisions and salaries (supported by capital inflows in the late 1970s). Policy shocks also prompted the contractions, typically in packages that included devaluation to adjust the external sector.

Table 3.4. **Annual Rates of Change at 1986 Constant Prices**
(Percentages)

Period	GDP	C	I	DD
1981-85	-2.0	-1.7	-10.9	-3.7
1986-90	-0.2	-0.2	-4.3	-0.9
1991-95	6.0	6.6	15.7	8.1
1990	-1.3	-1.1	-15.2	-3.4
1991	10.5	14.3	31.5	16.8
1992	10.3	13.3	33.5	16.6
1993	6.3	5.7	16.0	7.6
1994	8.5	6.9	21.8	9.8
1991-94	8.9	10.0	25.5	12.6
1995	-4.6	-6.1	-16.3	-8.4

Note:　　GDP = Gross Domestic Product; C = Consumption; I = Investment; DD = Domestic Demand.
Source:　　National Accounts.

The convertibility regime and greater availability of foreign funds in the 1990s did not change this pattern of large fluctuations and important policy impacts. The main difference lay in the longer expansion (1991–94) and significantly higher annual growth rates. Table 3.4 highlights the sharp fluctuations of the main aggregate variables. During the expansionary phase — most intense in the first two years — output grew at an average annual rate of 8.9 per cent, domestic demand at 12.6 per cent, consumption at 10 per cent and investment at 25.5 per cent. At the start, however, the 1990 GDP had been 10 per cent below its 1980 level, domestic demand 21 per cent lower and investment down 55 per cent. The 1995 recession came abruptly: output contracted by 4.6 per cent, domestic demand by 8.4 per cent and investment by 16.3 per cent.

The importance of policy factors in determining the short–run path of the economy becomes clear in a comparison of the convertibility regime with the Austral Plan. The mid–1980s stabilisation shock had an impact analogous to that of 1991–94; although growth rates were lower in the expansionary phase than in the 1990s, the exchange rate as a nominal anchor produced similar trends in relative prices and the pattern of demand expansion. The recessionary phase also showed similarities, especially the drop in investment — striking because the 1995 recession, unlike that of the 1980s, came not from a policy shock (i.e. devaluation) but rather from a change in expectations which operated directly on expenditure and *via* the monetary contraction induced by capital flight and the fall in reserves. Indeed, with an open capital account, private capital movements followed a procyclical pattern, deepening macroeconomic fluctuations rather than dampening them.

Easier foreign finance obviously softened the binding external gap. This significantly changed the macrodynamics. The increased supply of foreign funds had as a direct consequence the reversal in the trade balances as it affected the portion of domestically generated resources not consumed and available for allocation between investment and the trade surplus. Tables 3.5 and 3.6 show the evolution of these variables in current and constant prices. The huge trade surplus necessary to service the external debt had absorbed a significant part of gross domestic savings in the late 1980s; for a given rate of domestic saving this tended to crowd out investment, which remained depressed. In contrast, the trade account turned negative in the 1990s, making possible a higher investment rate, albeit one only slightly superior to the average of the preceding five years. The fall in the trade surplus allowed an increase of almost five percentage points in domestic demand, but practically all of it came from growth in consumption and not investment. The fall in the trade account freed resources that could have fed capital formation but did not. The market responded to the specific policy mix by using the funds to finance more consumption and the gross domestic saving rate fell with the trade surplus.

The averages cited for the preceding argument conceal one important fact about the evolution of investment *vis–à–vis* the trade account. Co–movement does in fact exist between investment and the trade surplus on a year–by–year basis, because of how the increase in the consumption rate occurred; it jumped once–for–all in 1991 then tended to remain stable at its new level in the following years. Hence the investment

Table 3.5. **Ratios to GDP at Current Prices**
(Percentages)

Period	C	I	X	M	DD	X-M	GDS
1981-85	77.0	20.3	8.9	6.2	97.3	2.7	23.0
1986-90	80.2	16.3	10.0	6.5	96.5	3.5	19.8
1991-95	84.0	17.4	7.7	9.1	101.4	-1.4	16.0
1990	81.1	13.2	10.6	4.9	94.3	5.7	18.9
1991	84.4	14.3	8.0	6.7	98.7	1.3	15.6
1992	85.6	16.3	7.2	9.1	101.9	-1.9	14.4
1993	84.3	18.3	6.6	9.2	102.6	-2.6	15.7
1994	83.2	20.2	7.1	10.5	103.4	-3.4	16.8
1995	82.9	17.7	9.5	10.1	100.6	-0.6	17.1

Note: C = Consumption; I = Investment; X = Exports; M = Imports; DD = Domestic Demand; GDS = Gross Domestic Saving.

Source: Based on National Accounts and Ministry of Economy data.

Table 3.6. **Ratios to GDP at 1986 Constant Prices**
(Percentages)

Period	C	I	X	M	DD	X-M	GDS
1981-85	79.6	19.3	8.4	7.4	98.9	1.0	20.4
1986-90	80.0	16.7	9.8	6.4	96.7	3.4	20.0
1991-95	83.3	20.1	11.0	14.4	103.4	-3.4	16.7
1990	79.7	13.4	12.8	5.9	93.1	6.9	20.3
1991	82.5	15.9	11.0	9.4	98.4	1.6	17.5
1992	84.8	19.3	10.2	14.3	104.1	-4.1	15.2
1993	84.3	21.0	9.8	15.1	105.3	-5.3	15.7
1994	83.1	23.6	10.5	17.2	106.7	-6.7	16.9
1995	81.7	20.7	13.5	15.9	102.4	-2.4	18.3

Source: National Accounts. For description of terms, see notes to Table 3.5.

rate did rise with the trade deficit in the expansionary phase; its peak in 1994 coincided with that of the trade deficit. Afterwards, in the recessionary phase, it bore almost all of the adjustment as consumption showed a relative low downward elasticity. A comparatively low rate of investment accompanied trade balance equilibrium in 1995.

The differences in the ratios in Tables 3.5 and 3.6 make it clear that the convertibility regime and the increase in the supply of foreign finance triggered important changes in relative prices, most notably those related to foreign trade and investment goods. Table 3.7 shows their evolution. Those for exports and imports plunged in the 1990s compared to 1985–90, by 33 per cent and 38 per cent, respectively. After liberalisation, the export coefficient at current prices contracted by 2.3 percentage points of GDP and the import coefficient rose by 2.6 points, mainly the result of the exchange rate appreciation generated in the stabilisation process; the volume and international value of trade grew significantly. Measured in 1986 prices, the degree of external opening in 1995 almost doubled from that of the second half of the 1980s. In the expansionary phase, imports in constant prices went from an average of 6.4 per cent of GDP in the second half of the 1980s to 17.2 per cent in 1994, while the export coefficient remained about the same. In the 1995 recession, the import coefficient fell slightly while the export coefficient rose sharply. Relative prices of investment goods, intensive in tradables, dropped by 12 per cent as the exchange rate appreciated and tariffs were eliminated.

Table 3.7. **Evolution of Prices Relative to GDP Deflator**
(1986 = 100)

Period	Consumption	Investment	Exports	Imports
1981-85	96.8	105.5	104.8	87.1
1986-90	100.2	98.6	102.5	102.1
1991-95	101.0	86.5	69.6	64.8
1990	101.7	98.8	83.0	83.6
1991	102.2	89.7	72.8	70.6
1992	101.0	84.7	70.2	63.9
1993	100.0	87.2	66.8	60.7
1994	100.2	85.5	68.0	61.4
1995	101.4	85.5	70.4	63.4

Source: Based on National Accounts and Ministry of Economy data.

Investment and Savings

The macroeconomic dynamics greatly contributed to shaping the paths of domestic investment and saving in the 1990s. The first two parts of this section analyse the saving and investment rates which resulted; the next two parts focus on the determinants of investment.

The Savings Ratio

Important changes took place in the performance of national and foreign savings as sources of investment financing in the convertibility period. Table 3.8 shows both as proportions of GDP[6]. The comparison between 1991–95 and the second half of the 1980s shows a rise of two percentage points of GDP in the use of foreign savings, which served to finance a one point increase in the investment rate and a one point drop in the national saving rate. The latter had fallen systematically in the 1980s to 14 per cent of GDP in 1989. It diminished further in the first two years of the expansionary phase, then tended to go up until 1994 and stagnated in the 1995 recession. The rate in 1994, the year with the highest activity level and investment ratio in the period, resembled the 1990 figure. Thus, an increment in foreign savings fully matched the seven percentage point increase in the investment rate between 1990 and 1994. In 1995, the fall of 2.5 percentage points in the investment rate was accompanied by a similar reduction in foreign savings.

Table 3.8. **Savings and Investment Ratios at Current Prices**
(as a percentage of GDP)

Period	Investment	National savings	External savings
1981-85	20.3	18.1	2.2
1986-90	16.3	14.8	1.5
1991-95	17.4	13.9	3.5
1990	13.2	15.2	-2.0
1991	14.3	12.8	1.5
1992	16.3	12.4	3.9
1993	18.3	14.0	4.3
1994	20.2	15.0	5.2
1995	17.7	15.1	2.6

Source: Based on National Accounts and Ministry of Economy data.

Clearly, the convertibility plan and structural reforms could not reverse the fall in the national saving rate, one of the most negative features of the 1980s. Although aggregate and per capita consumption dropped during the 1980s, the consumption rate showed a tendency to rise. This trend not only continued but also deepened in the 1990s with the permanent jump that coincided with the beginning of the surge in capital inflows and stabilisation in 1991. This explains the drop in the gross domestic saving rate (GDS) shown in Table 3.5. In the 1990s GDS reached about four percentage points of GDP lower than in the second half of the 1980s, in both constant and current prices. Note, however, that the drop in the relative price of capital goods greatly enhanced the financing capacity of savings (Table 3.9).

Table 3.9. **Savings and Investment Ratios at 1986 Constant Prices**[a]
(as a percentage of GDP)

Period	Investment	National savings	External savings
1981-85	19.3	16.7	2.6
1986-90	16.7	15.8	0.9
1991-95	20.1	16.0	4.1
1990	13.4	15.4	-2.0
1991	15.9	14.2	1.7
1992	19.3	14.6	4.6
1993	21.0	16.1	4.9
1994	23.6	17.5	6.1
1995	20.7	17.7	3.0

a.   All variables deflated with the Implicit Price of Gross Capital Formation.
Source: Based on National Accounts and Ministry of Economy data.

The Investment Ratio

Throughout the 1980s, successive rounds of adjustment had led to a persistent and sharp reduction in the investment rate. This declining trend reversed as one positive outcome of the renewal of capital inflows and stabilisation; the rate rose steadily in the expansionary phase from a low point of 13.2 per cent of GDP in 1990 — although it averaged only one percentage point higher than in the preceding five–year period (Table 3.8). It contracted once again in the 1995 recession. Nevertheless, because the relative price of capital goods fell, the investment rate at constant prices was much higher than at current prices. After reaching bottom at 13.4 per cent of GDP in 1990, it grew by ten percentage points in the expansionary phase, but only in 1993–94 did it

surpass the rates of the period following the debt crisis. Two–thirds of this increase resulted from a rise in the average investment rate at current prices and one–third from lower relative prices of investment goods. With the 1995 recession it fell again to 20.7 per cent of GDP, similar to the average of the early 1980s.

Exchange rate appreciation thus had a beneficial effect to the extent that the decrease in the relative price of capital goods boosted the capacity of available savings to finance investment. One should not underestimate, however, that consistency among the rise in investment at constant prices, the behaviour of national savings and the use of foreign savings depended on appreciation of the real exchange rate. An existing set of relative prices and ratios could become unsustainable or distorting for resource allocation and the macroeconomic environment for investment. In fact, the situation in 1994 provides a good example of the problems that such a situation can generate. At that height of the expansionary phase, the investment rate resembled those before the debt crisis, while national savings in current prices, at 15 per cent of GDP, mirrored the lowest rates of the 1980s; meanwhile, foreign savings reached 5.2 per cent of GDP. This situation proved unsustainable when capital inflows ceased after the Mexican devaluation. The 1995 adjustment reduced the use of foreign savings to 2.6 per cent of GDP, national saving remained at 15.1 per cent and investment at constant prices went down to 20.7 per cent. This happened without a devaluation that would have led to a rise in the relative price of imported capital goods, as had traditionally happened in analogous situations in Argentina. Thus, although exchange rate appreciation favoured the capacity to accumulate physical capital for a given flow of savings, the macroeconomic context, with the appreciated exchange rate an essential ingredient, apparently induced national saving behaviour that re–established the foreign savings constraint on the investment rate.

The Allocation of Investment

No comprehensive information on the sectoral allocation of investment exists to allow a thorough analysis, but one can search a set of partial data to find some empirical evidence regarding the orientation of investment between tradable and non–tradable activities. The guiding hypothesis posits that the sectoral composition of investment must have leaned towards non–tradable activities. The trends in demand in the expansionary phase of 1991–94 as well as changes in relative prices suggest it, and data from different sources examined below tend to support it.

Investment by Privatised Firms

In the 1980s the firms privatised or licensed between 1990 and 1993 had faced a financial restriction that curbed their capacity to invest. Privatisation and deregulation in a context of financial fluidity generated both incentives and conditions for a strong rise in investment in these activities. In addition, the clauses of most privatisation contracts and licenses incorporated investment commitments. Investment (in current pesos) by these firms in 1994 reached four times its level in 1991 (Table 3.10). Its

Table 3.10. **Investment of Privatised Firms, 1991-94**[a]

(millions of current pesos)

	1991	1992	1994
Oil	631.1	663.3	1 754.2
Energy	183.8	98.2	400.4
Communications	299.9	556.4	2 020.0
Transports	46.8	30.7	190.4
Water and sewage	10.5	13.3	143.0
Total	1 172.1	1 361.9	4 508.0

a.   1993 has been ignored because figures are not reliable in the year of transition between public and private administration.
Source: Proyecto de Presupuesto 1996.

Table 3.11. **Foreign Direct Investment Projects, 1994-95**

($ million)

	Type of activity	Type of project			
		Purchase of firms	New investment	Joint venture	Total
Telecommunications	NT	1 039.0	3 501.0	170.0	4 710.0
Automobile	SR	206.5	3 353.6	190.3	3 750.4
Food, Beverages, and Tobacco	T	984.3	1 175.0	169.5	2 328.8
Oil and Gas	T	590.7	592.0	-	1 182.7
Electric Energy	NT	872.7	533.3	-	1 406.0
Paper and Timber	T	61.5	379.0	-	440.5
Supermarkets and Distribution	NT	6.5	322.9	47.0	376.4
Chemical and Pharmaceutical	NT	759.6	160.3	204.5	1 124.4
Mining	T	-	1 131.0		1 131.0
Banks and Insurance	NT	447.4		51.0	498.4
Hotel	NT	-	107.0	18.0	125.0
Electrical Appliances	T	-	45.0	60.0	105.0
Aluminium	T	87.0	95.0	-	182.0
Construc. and Constr. Material	NT	45.0	25.0	37.0	107.0
Textile	NT	112.0	4.5	-	116.5
Health Care	NT	55.0	4.0	-	59.0
Others	NT	194.7	354.3	23.0	572.0
TOTAL		5 461.9	11 782.9	970.3	18 215.1
Manufacturing		2 255.9	5 237.4	661.3	8 154.6
Mining		-	1 131.0	-	1 131.0
Rest		3 206.0	5 414.5	309.0	8 929.5
Tradables(T)		1 723.5	3 417.0	229.5	5 370.0
Non Tradables(NT)		3 531.9	5 012.3	550.5	9 094.7
Special Regimes(SR)		206.5	3 353.6	190.3	3 750.4

Source: Based on the Fundación Invertir Argentina data. Survey of announcements of FDI projects.

growth rate far surpassed that for total investment. Excepting oil — a sector in which the country both exports some domestic production and imports — all of these firms' activities are non–tradable and a great part of the rise is concentrated in telecommunications. Although important, however, this phenomenon does not provide a major indication of the trend of total investment because capital outlays by privatised firms represent a small share of gross domestic investment, which amounted to 55 billion pesos in 1994.

The Allocation of Foreign Direct Investment

In 1994–95 a private agency surveyed foreign direct investment projects by sector. The data include the purchase of existing firms, joint–ventures and new investment projects. Classifying the corresponding activities as tradable and non–tradable and separating the automobile sector (subject to a special regime of protection), the data in Table 3.11 show that approximately half of the total went to non–tradable activities, 30 per cent to tradable activities and 20 per cent to the automobile sector.

The Sectoral Destination of Capital Goods Imports

Table 3.12 describes the composition of investment expenditure between 1980 and 1994, divided into construction and equipment. Measured at current prices, the structure has not varied significantly in the 1990s compared to the 1980s. In contrast, the composition of investment measured at constant prices shows a notable jump in the proportion of equipment. This includes machinery and direct production equipment as well as ancillary equipment like computers for offices and telecommunication equipment.

Notwithstanding that there is no comprehensive information on the sectoral allocation of investment, data do exist for the composition and sectoral destination of capital goods imports. Whereas gross investment at constant prices rose by a factor of 2.2 between 1990 and 1994, imports of capital goods (including ancillary equipment) went up 9.5 times in the same period. Such imports in 1994 represented 16 per cent of gross investment and about half of investment expenditure on equipment. Table 3.13 tracks changes in the composition and sectoral destination of capital goods imports from 1987–90 to 1991–94. It breaks down agriculture, mining and manufacturing — producers of tradable goods — and groups the remaining sectors under "other sectors" — basically producers of non–tradable services. (The data do not support classifying imported capital goods between machinery and direct production equipment on the one hand, and ancillary equipment on the other, for the "other sectors".) The share of "other sectors" in total imports of capital goods clearly stands out. Its increase almost exactly matched the drop in the share of manufacturing. Agriculture and mining have low ratios, with variations consequently of little importance. During a time when total imports of capital goods had an average annual growth rate of 75.6 per cent, the tradable sectors had a lower rate (40.7 per cent in manufacturing) while that for the non–tradable sectors reached 88.9 per cent.

Table 3.12. **Composition of Gross Domestic Investment, 1980-95**

(percentages)

	Buildings	Equipment
At current prices		
1980-95	65.9	34.1
1980-83	68.5	31.5
1984-88	66.1	33.9
1989-90	65.4	34.6
1991-94	63.5	36.5
1995	66.0	34.0
At 1986 prices		
1980-95	61.8	38.2
1980-83	64.4	35.6
1984-88	65.7	34.3
1989-90	65.2	34.8
1991-94	54.3	45.7
1995	53.0	47.0

Source: Based on official data.

Table 3.13. **Sectoral Destination and Composition of Imports of Capital Goods, 1987-94**

(percentage of each period total)

	1987-90	1991-94
Agriculture	2.1	2.7
Machinery and direct product. eq.	1.2	1.6
Ancillary equipment	0.9	1.1
Mining	0.6	0.4
Machinery and direct product. eq.	0.4	0.3
Ancillary equipment	0.2	0.1
Manufacture	50.5	36.8
Machinery and direct product. eq.	36.4	25.7
Ancillary equipment	14.1	11.2
Other sectors	46.8	60.1
Total	100.0	100.0

Source: Based on official data.

Ministry of Economy data.

Some Evidence about Investment in the Manufacturing Sector

The 1993 Economic Census provides some evidence on the allocation of investment within the manufacturing sector in the 1990s. An econometric cross–section analysis with the sector divided into 34 branches shows a significant (at the 3 per cent level) regression coefficient between the investment in equipment/value added ratio and the export/production ratio. To interpret this result, note that the value of manufactured exports in 1993 remained similar to that in 1990. The only relevant change involved increased automobile exports, subject to a special foreign trade regime from 1991. Manufactured exports in 1993 thus came from the branches that had already exported in the late 1980s — basically oil, agricultural commodities like edible oils and leather, and industrial commodities like aluminium and steel — plus the automobile sector, which led industrial output growth between 1991 and 1993. The regression result indicates that increased investment in the manufacturing sector tended to concentrate in these branches. The automobile sector provides the clearest case because it not only expanded exports but also strongly expanded output to satisfy growing domestic demand. The others, capital intensive with relatively modern plants, had already become able to face international competition as exporters in the late 1980s.

The Behaviour of Aggregate Investment

This section analyses the behaviour of aggregate investment more rigorously, exploring the hypothesis that it apparently did not change significantly from the 1980s despite structural reforms and the drastic reduction in inflation. Figure 3.1 shows quarterly series of GDP, domestic demand and gross domestic investment at constant prices in 1980–95.

To focus on investment behaviour, one can estimate an investment function using the so–called flexible–accelerator model:

$$I(t) = a1\ Y(t) + a2\ Y(t–1) + a3\ I(t–1) \tag{1}$$

Equation (1) is derived by applying the Koyck transformation (Koyck, 1954) to an equation with distributive lags derived from a model with constant capital output, depreciation and partial adjustment coefficients[7]. It can be written as:

$$I(t) = h\ k\ Y(t) – h\ k\ (1–d)\ Y(t–1) + (1–h)\ I(t–1),$$

where the coefficients have the meaning explained in endnote 7.

Estimations tried alternatively with GDP and domestic demand gave good results with both but slightly better ones with domestic demand. Regression 1 shows the results of that estimation. The adjustment indicators are satisfactory and the coefficients, highly significant, have the expected signs. The estimate of the constant is not different from zero at the 5 per cent level of significance. The function includes lagged variables; an LM test rejects the existence of autocorrelation of the residuals.

Figure 3.1. **Evolution of GDP, Domestic Demand and Gross Fixed Investment, 1980-95**
(Seasonally Adjusted Quarterly Series at 1986 Constant Prices)
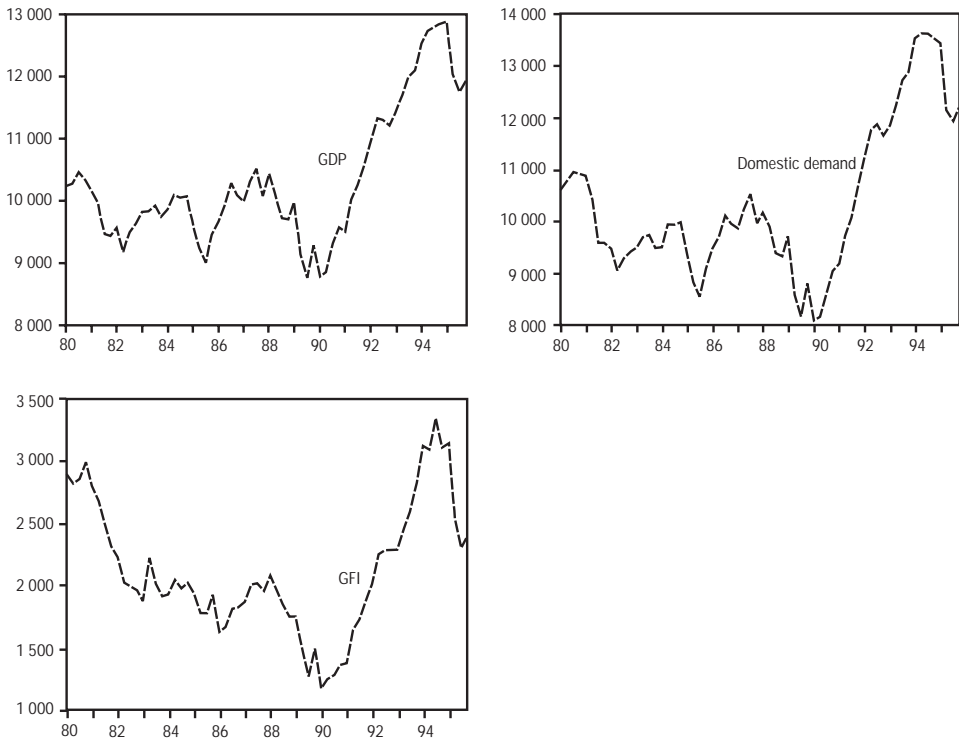
Regression 1

No. obs. = 63

$$I(t) = 0.372 \, DD(t) - 0.320 \, DD(t-1) + 0.892 \, I(t-1) - 221.9$$

$$(13.883) (-9.204) (14.861) (-1.676)$$

(t statistics between parentheses)

$R^2 = 0.943$ R^2 adj. $= 0.940$ F $= 322.7$

Chow Test

F = 2.079 Prob. = 0.096

Chow Forecast Test

F = 0.922 Prob. = 0.562

The model describes well the behaviour of aggregate investment throughout the period. An interpretation of the results could be that aggregate investment depends mainly on current demand and the past performance of demand and investment[8]. Alternatively, equation (1) could reflect a macroeconomic model determining current demand and investment simultaneously. As already noted, the cycles throughout the 1980s and the 1990s apparently shared a common pattern, precisely the hypothesis under test here for investment behaviour. Stability of the equation would suggest stability of the factors affecting both aggregate demand and investment throughout the period.

The two Chow tests analyse the stability of the model between the 1980s and 1990s. The first looks for stability between the two decades, with the breakpoint in quarter 1991:2 when the Convertibility Plan was implemented. The null hypothesis is not rejected. The second, the Chow Forecast Test for the forecast of sub–period 1991:2–1995:4, estimates the equation with the data of the preceding sub–period and tests the null hypothesis that prediction errors have a zero mean, i.e. that the model is stable; it too is not rejected. The estimated coefficients in Regression 1 yield the parameters of the model:

k = 3.41, h = 0.11 and d = 0.11.

As a general conclusion, these results affirm the robustness of the two hypotheses that motivated the analysis. First, the aggregate investment dynamics relate closely to changes in domestic demand in the form stylised by the flexible accelerator model. Second, this association does not seem to have undergone significant changes in the 1990s.

A feature of the 1995 experience supports the hypothesis of a strong link between investment and domestic demand. The contraction in investment coincided with an important jump in exports which, *ceteris paribus*, implied a 3 per cent hike in GDP. Hence, and simplifying the argument by neglecting the crossed effects, the 1995 macroeconomic performance can be seen as the result of two shocks: the negative shock of the Tequila effect, causing a contraction in domestic demand of 8 percentage points of GDP; and the positive shock from exports equivalent to 3 percentage points of GDP. Since the net result was a deep contraction in investment, the domestic demand effects on investment tended apparently to be much more important and to dominate the positive pull from the rise in exports.

Changes in the Generation and Allocation of Financial Resources

The surge in capital inflows under the convertibility regime induced quantitative and qualitative changes in the supply and demand for financial resources which resulted in an overall financial deepening of the economy. Nevertheless many of the important weaknesses of the 1980s in the process of intermediation between savings and investment remained. The Argentine capital markets still show a high degree of segmentation which acts against innovative and smaller enterprises. There is a marked scarcity of long–term credit to finance private investment. The total capitalisation of

the stock exchange is low and it is difficult to fully diversify non–systematic risk because quoted firms are concentrated in a reduced gamut of activities. The financial fragility of the system remains high and the influence of systemic risk keeps interest rates too high. All these factors help importantly to explain why the Argentine economy was among those most affected by the Mexican crisis, and particularly why the investment rate fell so precipitously.

With these market failures in financial intermediation, firms and individuals cannot decide on investment and saving on the basis of "real" factors only. In an environment characterised by market imperfections neither the Modigliani–Miller nor the Fisher Separation theorems hold and, consequently, *finance matters for the investment decision.* Because a firm must reckon with whether it can finance an investment project with internal rather than external funds, it will also consider the effects on its leverage of implementing the project. Under these circumstances, a complete assessment of investment behaviour under the convertibility regime requires analysis of the most relevant changes on the financial side of the economy. Three factors come into play. *First,* changes in the investment/saving decisions of the private and public sectors had counterparts in the changing pattern of generating financial resources at the macro level. *Second,* how, in the context of greater stability, did the banking sector increase the supply of credit so as to trigger the expenditure–led cycle of 1991–95? *Third,* at a more micro level, modifications occurred in the pattern of firms' portfolio decisions.

The Structure of Sectoral Deficits a•And Surpluses

Changes in aggregate investment and saving behaviour greatly modified the propensity of each sector to generate or absorb financial resources. Under the convertibility regime, the government's borrowing needs exerted much less pressure on domestic financial markets because of both the structural adjustment of the public sector and the renewed possibility of financing the deficit in the international market. This affected not only the size of supply and demand for financial assets but also the mix of financial instruments in the economy.

The evolution of aggregate surpluses and deficits generated by each sector offers a simple way to see how financial resources were created and absorbed. Table 3.14 shows savings and investment of the private sector, the government and the rest of the world over the last 15 years. Its first important fact involves a huge drop in the government's borrowing requirements. Adjustment in the public sector has made the deficit much lower in the 1990s than in the 1980s. The lower deficit resulted from the recomposition of government savings and a pronounced fall in public investment. Between 1986–90 and 1991–95 the fiscal deficit narrowed by 6.5 percentage points of GDP; 3.7 points of this came from the recovery of the government's saving rate and the remaining 2.8 points from the fall in investment. The recovery of the saving rate arose primarily from higher revenue resulting from the increase in the tax burden and the elimination of subsidies (especially tax exemptions associated with promotional

programmes). Public consumption played no role in augmenting savings; on the contrary, it increased by more than one percentage point of GDP after the implementation of convertibility. The improvement in government savings alone, however, was not strong enough to adapt the economy to the convertibility regime. This obliged the government to resort to repression of capital expenditures, with a public investment rate much lower in the 1990s than in the highly unstable 1980s.

Table 3.14. **Saving and Investment Rates, 1981-95**

(annual averages, as a percentage of GDP at current prices)

Period	Private		Government		National total		Rest of the world
	Sav.	Inv.	Sav.	Inv.	Sav.	Inv.	
1981-85	24.8	14.9	-6.7	5.4	18.1	20.3	2.2
1986-90	18.6	11.7	-3.8	4.6	14.8	16.3	1.5
1991-95	14.0	15.6	-0.1	1.8	13.9	17.4	3.5
1990	17.8	10.1	-2.6	3.1	15.2	13.2	-2.0
1991	14.5	12.2	-1.7	2.1	12.8	14.3	1.5
1992	12.4	14.5	0.0	1.8	12.4	16.3	3.9
1993	12.8	16.3	1.2	2.0	14.0	18.3	4.3
1994	14.8	18.5	0.2	1.7	15.0	20.2	5.2
1995	15.1	16.3	0.0	1.4	15.1	17.7	2.6

Source: Based on Ministry of Economy and National Accounts Trade Balance figures.

Although the fiscal deficit declined remarkably, the surplus of the rest of the world not only did not fall but indeed rose with mounting use of foreign savings due to the widening private sector deficit. Between 1986–90 and 1991–95 the private sector increased its demand for financial resources from the rest of the system by 8.5 percentage points of GDP — and covered it by an increment in the current account deficit of two points and the fall in the public sector deficit of 6.5 points. This amounted to a remarkable process of financial crowding–in by the private sector.

Why did the private sector so greatly increase its borrowing needs? As Table 3.14 shows, the reasons lie in both the fall in the saving rate and the recovery of investment. Private sector saving dropped by 4.6 percentage points while the sector's investment rate recovered by 3.9 points. The comparison of five–year averages hides some relevant facts about how the fall in the saving rate occurred: a huge decline in the propensity to save which occurred at the very beginning of the convertibility programme. Stabilisation apparently had a very negative impact effect on saving, with a drop of 5.4 percentage points of GDP in the saving rate between 1990 and 1992. After this first impact, the private saving rate has shown a mild upward trend.

Many factors could, in principle, explain the drop in the private saving rate. First, the disposable income/GDP ratio fell at the beginning of the programme because of the increased tax burden and the reduction in subsidies. This may have affected private saving negatively. Second, consumption increased at the same time. Variables that seem relevant to this combine in a complex way: the recomposition of consumer credit *pari passu* with the remonetisation of the economy; and the realisation of consumption postponed during the hyperinflationary period, together with the effects of opening the economy, which increased the range of consumer products available and, in conjunction with the exchange rate appreciation, significantly reduced the relative price of durable goods. One could also hypothesise a "Ricardian equivalence" effect from the reduction in the fiscal deficit, but it might not be plausible given pervasive market failures in the capital markets.

The conclusion thus emerges that the expansion in expenditures of the private sector basically generated the widening of the current account disequilibrium, which in turn explains why the Mexican crisis produced a sharp reduction in private sector expenditures. The market mechanisms which induced the adjustment operated through the capital markets. After the crisis, in 1995, the private sector faced a sudden credit rationing. Under these conditions the adjustment most strongly affected private expenditures most closely related to the availability of credit: consumer durables and capital goods. Between 1994 and 1995, the rest–of–world surplus fell by 2.6 percentage points of GDP, of which 2.5 came from the reduction in private sector borrowing. This makes worthwhile a look at the overall dynamics of the financial system and firms' financial decisions.

Capital Inflows, Financial Deepening and Systemic Risk

The financial resources freed by both the fall in the borrowing needs of the public sector and the renewed stream of capital inflows decisively changed the scenario of investment decisions. *Via* the remonetisation of the economy, the domestic banking system served as one of the most important channels for the reallocation of resources toward the private sector. In a non–Modigliani–Miller world with credit rationing, the greater availability of loanable funds relaxed the credit constraint faced by firms and households and thereby fuelled investment and expenditures on durables.

In the 1980s, the demand for financial assets issued by the domestic banking system plummeted. The demand for money fell because of the persistence of high inflation and the demand for domestic assets of longer maturity declined due to uncertainty generated by the debt crisis. Along with less financial deepening came capital flight. Naturally, then, the sharp reduction in the inflation rate and uncertainty induced by the Convertibility Plan reversed both capital flight and demonetisation. Table 3.15 shows the strong recovery in monetisation since 1991. As a counterpart to recovery in the demand for money, the supply of credit increased significantly. Because the public sector was not demanding funds, this increase in credit availability benefited the private sector.

Table 3.15. **Monetary Aggregates**

(as a percentage of GDP)

End of	Total loans of banking system	M1	M3	M3* [a]	Share of deposits ($)
1990	12.9	2.5	5.5	7.0	-
1991	14.7	3.8	6.3	9.5	44.7
1992	17.2	4.7	8.3	12.7	44.1
1993	18.9	5.7	10.8	17.5	47.5
1994	20.6	6.4	11.9	20.3	51.0
1995 March	19.6	5.8	9.9	17.5	54.1
June	19.1	5.8	9.9	17.1	51.0
Sept.	18.9	5.9	10.0	17.9	53.0
Dec.	20.9	6.5	10.8	19.2	54.0

a.   M3* = M3 plus total dollar deposits.
Source: Own calculations based on data from Banco Central de la República Argentina (BCRA).

The current process of financial deepening has weaknesses. The credit/GDP ratio remains much lower than in countries showing a similar level of development. Increased demand for financial assets has shown a bias in favour of dollar–denominated instruments. The same bias occurs in the credit generated by the system. Despite no specific regulation of the Central Bank, the banks apparently have tried to match dollar–denominated assets and liabilities on their balance sheets in order to avoid taking an excessive devaluation risk. The increased share of dollar–denominated instruments may exacerbate the financial fragility of the system — as the financial crisis following the Mexican devaluation demonstrated — because it is not possible to diversify away the devaluation risk for the system as a whole. If depositors and banks try to avoid it by dollarising their portfolios, those borrowing from banks will have to bear it. The risk can be very high for debtors demanding credit to finance production of non–tradables. Because a debtor can go bankrupt, however, the dollarisation of credit and deposits cannot completely insure banks against unanticipated changes in the real exchange rate. A devaluation could trigger a generalised payment crisis, and the behaviour of banks in matching dollar–denominated assets and liabilities would be useless as insurance against the risk of insolvency.

This close relationship between financial fragility and perceived devaluation risk means that in a dollarised system the evolution of the current account deficit and the availability of foreign finance will directly influence the stability of the banking system. Table 3.16 illustrates these features. It shows the evolution of systemic risk measured by so–called country risk. Two stages followed the implementation of the Convertibility Plan. The first encompassed the period up to the Mexican crisis. At the start, the success of stabilisation induced a permanent and favourable reduction of systemic risk. In spite of the increasing current account deficit, the authorities did not face credibility problems affecting the exchange rate, because of the fluidity of external credit. Nonetheless, the financial fragility which remains after the once–and–for–all fall which took place in 1991 induced two negative features: sizeable fluctuations in the country risk and its high average level.

Table 3.16. **Interest Rates, Country Risk, and Expected Devaluation Rates**

(annual percentages)

	Domestic interest rate (1)	IRR Bonex 89 (2)	Libor (3)	Estimated country risk rate (4)	Expected devaluation (5)
1991 March	207.7	19.6	6.5	12.3	157.3
1991 December	19.8	10.1	4.4	5.6	8.8
1992 December	25.3	12.7	3.6	8.7	11.2
1993 December	8.7	6.3	3.5	2.7	2.2
1994 December	9.6	9.7	7.0	2.3	-1.1
1995 January	10.7	11.1	6.6	4.2	-0.4
February	11.6	14.9	6.4	7.9	-2.9
March	19.4	13.8	6.4	6.9	4.9
April	19.1	12.5	6.3	5.8	5.8
May	15.5	9.9	6.1	3.6	5.1
June	10.8	9.9	5.9	3.8	0.8
July	10.2	10.1	5.9	4.0	1.1
December	9.0	9.1	5.6	3.4	-0.0

(1) Interest rate on 30-day term peso deposits.
(2) Internal rate of return of the Bonex 89.
(3) 180 days in dollars.
(4) = {[1+(2)]/[1+(3)]}-1
(5) = {[1+(1)]/[1+(2)]}-1

Source: Own calculations based on data from BCRA and *Carta Económica*.

The Mexican crisis opened the second stage. Immediately following it, capital inflows reversed and domestic bank deposits fell sharply (Tables 3.3 and 3.15). This sufficed to jeopardise financial stability. The private sector deficit that had generated the current account imbalance could no longer be financed. Rational agents corrected upward their assessment of the probability of an abandonment of the convertibility regime and the perceived level of country risk jumped. Backing from the IMF, acting as lender of last resort, together with severe reduction of the current account deficit, nonetheless reversed the upward trend of the country risk in the second quarter of 1995. The harsh restriction of both domestic and external credit faced by the private sector after the crisis ended the business upswing that had begun with the convertibility regime and severely depressed investment.

Firms' Financial Decisions[9]

Capital inflows and financial deepening induced noticeable changes in firms' capital structure[10]. The greater availability of credit following liberalisation allowed them almost to double their leverage levels between 1990 and 1995. Although the rate of growth differs among the groups of companies, leverage levels in 1995 did not differ much among them, and the average leverage ratio (67.5 per cent) resembled those in the other large Latin American economies (82 per cent in Brazil and 62 per

cent in Mexico (López Larroy *et al.*, 1995). The average leverage in 1995 approached that of the period prior to the debt crisis at the beginning of the 1980s (Figure 3.2). The prolonged period of external credit rationing which followed the debt crisis apparently forced private corporations to work with leverage ratios much lower than the optimal or desired. Once the credit channel began to normalise, firms showed a strong preference for higher levels of indebtedness.

One of the factors which had most adversely affected investment in the 1980s was macroeconomic uncertainty, which induced a shrinkage in the duration of financial contracts. Figure 3.2 also shows that in spite of the recovery in capital inflows and the greater availability of funds in the 1990s, the inability of the domestic system to generate long–term financing persisted after 1991. The short–run/long–run liabilities ratio for the whole sample fluctuated around 67 per cent between the end of hyperinflation and early 1995.

Market segmentation does exist, however, with a marked difference between the largest firms (the privatised firms and holding companies in the sample) and the rest. With leverage ratios about the same, the former depend much less on short–run financing; there is no tendency for this difference to disappear. An important segmentation also exists between the foreign and domestic capital markets. Only the largest Argentine firms have easy access to the international capital market and need not rely on the domestic banking system for credit. Two indicators show this. First, during the convertibility period, bank debt represented 26 per cent of total liabilities of large firms and 43 per cent of those of medium–sized firms (López Larroy *et al.*, 1995). Second, the holding companies and newly privatised corporations increased the proportion of dollar–denominated debt under the convertibility regime, while the opposite occurred in the remainder of the sample which includes smaller firms (Table 3.17). Large enterprises tend to have long–term external financing.

Table 3.17. **Dollar Debt/Total Debt of Firms Quoted on the Buenos Aires Stock Exchange**
(Percentages)

	Total	Tradables	Non-tradables	Privatised	Holding Companies
1990	46.1	50.9	35.7	n.a.	23.4
1991	50.8	55.8	42.8	41.1	29.2
1992	33.6	34.8	23.3	33.6	38.4
1993	23.8	19.9	12.8	32.9	49.5
1994	24.4	24.1	17.3	32.5	32.4
1995	22.5	19.5	11.1	66.3	43.0

Source: Calculated on the basis of Buenos Aires Stock Exchange data.

Figure 3.2. **Evolution of Leverage and Short Run / Long Run Debt of Firms Quoted on the Buenos Aires Stock Exchange: 1980 III - 1996 I** (at Constant March 1996 Prices)
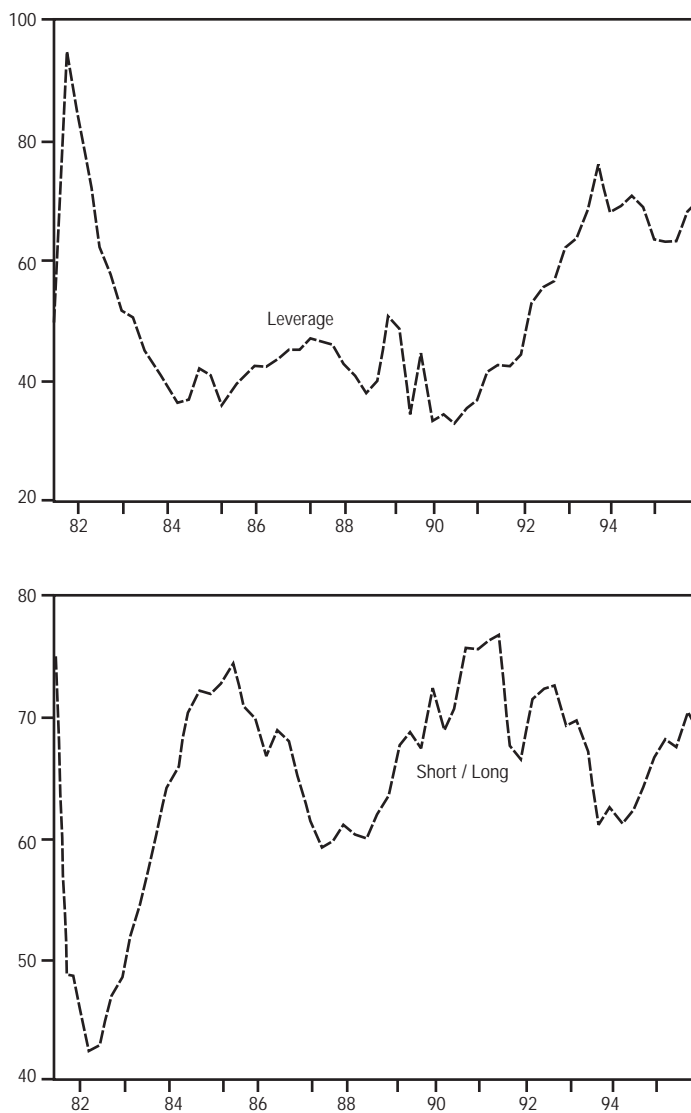
How did all these changes in financial decisions affect real investment? An analysis of balance sheets suggests that they privileged the rebuilding of "working capital" instead of real investment. Table 3.18 shows that two items which grew more in the 1990s were commercial credit and cash. This related closely to the recovery of financial intermediation after hyperinflation. The increase in cash reflects the recomposition of liquidity while the increase in commercial credit arose from the need to rebuild inter–firm credit relations. Inter–firm credit, endogenously generated by supplier/customer relationships, constitutes the core of the informal financial system in Argentina. To a great extent, hyperinflation had destroyed such credit relations, with very distortive consequences for the efficiency of firms. As with the leverage ratios, macroeconomic instability and credit rationing in the 1980s had led firms to operate with suboptimal working capital. The rapid recovery of inter–firm credit, *pari passu* with the increase in the availability of credit in the formal system, suggests an important correlation between changes in the supply of loans in the formal market and changes in the informal one.

Table 3.18. **Changes in Balance Sheet Items of Firms Quoted on the Buenos Aires Stock Exchange**
1995 II and 1991 II

Group	Total		Tradable		Non-tradable		Holding Companies	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Assets	100.0	45.7	100.0	67.3	100.0	31.9	100.0	92.4
Goods for exchange	18.0	83.1	9.5	35.6	30.9	103.2	2.2	59.0
Non-fixed real assets	22.7	21.9	27.7	39.8	14.4	8.7	33.7	110.5
Commercial credit	29.9	135.2	24.5	182.5	47.9	144.1	3.0	31.6
Financial investments	20.2	29.3	26.9	73.9	-6.4	-7.4	60.8	95.2
Cash	1.8	134.5	0.9	59.0	3.0	159.4	0.2	175.6
Others	3.0	1 096.6	1.0	100.4	5.7	4 812.0	0.0	
Liabilities	64.1	98.5	47.6	98.0	75.6	77.9	57.0	250.0
Short-term debt	42.5	93.2	27.6	71.9	60.6	87.6	22.5	214.7
Long-term debt	21.6	111.0	20.0	196.6	14.9	53.7	34.4	280.1
Net worth	35.8	23.3	52.5	52.4	24.4	11.3	43.0	50.4

(1) As a percentage of changes in total assets.
(2) Percentage changes between periods.
Source: Calculated from Buenos Aires Stock Exchange data.

Conclusions

A clear and positive association exists between the recovery of capital inflows at the beginning of the 1990s and the reversal of the falling trend in the investment rate from which the economy had suffered in the 1980s. The reversal of capital inflows after the Tequila shock also clearly coincided with a fall in the investment rate. Although one cannot do a complete analysis of the economic behaviour which created this association between investment and capital inflows and the channels through which it occurred, some hypotheses and stylised facts can serve future research.

First, in Argentina a very important indirect channel connected capital inflows with investment demand. It operated *via* the effects of capital inflows on the macroeconomic evolution of the economy. The greater availability of funds in the 1990s softened credit rationing after the debt crisis. The relaxation of the external constraint, in turn, made a sharp stabilisation of expectations and of the price level possible. The availability of foreign financing permitted maintenance of the nominal exchange rate despite real currency appreciation and an increase in the trade deficit. The exchange rate as a nominal anchor was crucial to disinflation. Increased price stability positively affected investment in many ways: it reduced macroeconomic uncertainty and favoured animal spirits; it induced a significant increase in the demand for domestic financial assets which relaxed the extreme credit constraint firms underwent in the 1980s; and stabilisation of the economy encouraged the recovery of aggregate demand.

Second, a direct channel also connects investment and the supply of foreign funds. In addition to the obvious fact that FDI is a part of capital inflows, the direct channel operates because in a non–Modigliani–Miller world the credit constraint matters to investors; changes in the supply of foreign financing have a direct effect on the severity of the credit rationing that firms face. In Argentina, two factors accentuate this effect: a continuous deficit on current account, and the convertibility rule and dollarisation. Because of convertibility and dollarisation, the most relevant way to expand the supply of banking system credit operates *via* increases in both foreign reserves and the demand for "argendollars". In this way, credit to firms and the domestic financing of investment become extremely dependent on capital inflows. One weakness of this scheme is that, *ceteris paribus*, the greater the volatility of demand for domestically generated assets (i.e. the demand for M3*), the greater the volatility of investment. Indeed, we have stressed the profound macroeconomic fluctuations of the 1990s to call attention to the close relationship between shifts in the macroeconomic aggregates (particularly investment demand) and instability in the demand for domestic assets.

Among other things, the degree of volatility in the demand for domestic assets (either dollar– or peso–denominated) depends on the types of foreign capital flows and the maturities of the instruments available in the domestic capital market. *Ceteris paribus*, the higher the proportion of short–term funds in capital inflows and the shorter the maturities of domestic financial assets, the greater the volatility of the demand for domestic assets. In Argentina, both factors had importance in explaining the financial distress which occurred after the Mexican devaluation of 1994.

A *third* stylised fact from the 1980s: notwithstanding structural reforms (particularly the opening of the capital account), the evolution of aggregate demand remains a crucial determinant of investment demand. At first sight, it could appear inconsistent to state that the recovery in capital inflows favoured investment, but that at the same time, at the aggregate level, the evolution of aggregate demand determined it. Yet in a world with capital market imperfections, firms tend to follow a sequence in looking for funds to finance investment: their first choice is retained earnings, with bank (or market) credit only in second place. The higher availability of credit from foreign sources and from the banking system, triggered by the recovery in capital inflows, opened a new financing alternative. This undoubtedly had a positive effect on capital formation. A high degree of market segmentation exists in Argentina, however, and the financial and capital markets remain small. As the balance–sheet analysis showed, only a reduced group of large firms actually improved their financial position in the 1990s. Consequently, it would seem a reasonable hypothesis for Argentina that demand — closely related to the evolution of cash flow — remains the main determinant of investment for most people making investment decisions. Obviously, this should not be interpreted as a policy recommendation of how to foster investment. The sustainability of investment depends on that of output growth and, consequently, on the composition of demand expansion and the allocation of investment.

The last point relates to the sustainability of the growth path followed by Argentina in the 1990s. The behaviour of domestic savings in the expansionary and contractionary phases suggests that the macroeconomic policy implemented in the 1990s led to a set of relative prices which generated a low rate of domestic savings. Under these circumstances, growth and investment rates could not rise without increasing the economy's dependence on foreign savings. The Tequila effect showed that the process could become unsustainable.

Notes

1. Detailed analyses of the Convertibility Plan are presented in Chisari, Fanelli and Frenkel (1996), Fanelli and Frenkel (1996) and Gerchunoff and Machinea (1995).

2. A modification in the exchange rate had to be approved by Congress; this was intended to bolster the credibility of the government's commitment to renouncing devaluation as a policy tool.

3. The first institutions to become insolvent had invested heavily in public bonds and domestic equities and were highly leveraged.

4. This part is partially based on Fanelli and Machinea (1995).

5. Nonetheless, the figure corresponding to compensatory capital outflows in 1993 overestimates the size of debt repayments. It includes \$4.2 billion corresponding to the exchange of "new" for "old" bonds under the Brady agreement.

6. National savings is estimated from the savings-investment identity as the difference between gross fixed investment and foreign savings. The difference between gross domestic savings — whose performance was discussed above — and gross national savings corresponds to payments to foreign factors of production.

7. It is easy to interpret these coefficients if we assume, for this purpose only, that existing and desired capital (i.e. existing and desired production capacity) are equal in the periods prior to t. Writing $h = 1 - a3$, the function can be expressed as:

$$I(t) - I(t-1) = h \left[a1/h \ Y(t) + a2/h \ Y(t-1) - I(t-1) \right]$$

where the first term in brackets represents the desired investment $I^*(t)$ in the period and h is a partial adjustment coefficient:

$$I(t) - I(t-1) = h \left[I^*(t) - I(t-1) \right]$$

Denominating $k = a1/h$ and $d = a2/a1 - 1$, the desired investment can be expressed as:

$$I^*(t) = k \ Y(t) - k \ (1-d) \ Y(t-1) = k \left[Y(t) - Y(t-1) \right] + d \ k \ Y(t-1)$$

where k and d can be interpreted as the constant capital-output and depreciation coefficients, respectively. The first term represents the accelerator effect and the second term the repositioning of the depreciation of capital in t-1. More generally, the flexible accelerator model assumes that

$$I(t) = h \left[K^*(t) - K(t-1) \right] + d \ K(t-1)$$

where $Y(t) = K^*(t)/k$ is the desired production capacity and $K(t-1)(1-d)/k$ is the existing production capacity. The estimation of the reduced form (1) makes it possible to estimate the parameters of the model without directly employing data on existing capacity. In fact, the procedure implies the estimation of a series on existing capacity under the hypothesis of constant partial adjustment, depreciation and capital-output coefficients.

8. This is the usual result obtained in empirical studies of investment behavior in developing countries. In an broad survey of theoretical and empirical work, Servén and Solimano (1992) conclude that "empirical studies of investment in developing countries show that changes in output are the most important determinant of private investment." These same authors obtained an analogous result in a cross-country econometric analysis (Servén and Solimano, 1993). Aggregate activity also emerges as the main explanatory variable of private investment in a recent econometric analysis by an IMF team of investment behavior in eight countries (Goldsbrough *et al.*, 1996). These authors observe that "the estimates generally underscore the important role of accelerator-type effects (except for Bangladesh), indicators of financial policy and macroeconomic stability in explaining the observed pattern of private investment." Aggregate output appears as the main determinant of private investment in Argentina in a previous econometric study for the period 1978-90 (Sánchez, 1995).

9. This section is based on Fanelli *et al.* (1996).

10. The indicators used in the analysis have been calculated on the basis of balance sheet data from a sample of firms quoted on the Buenos Aires Stock Exchange (BSE). The market value of the companies in the sample is equivalent to 99 per cent of total market capitalisation. For analysis the sample was organised into four groups of firms. The first comprises thirty-eight companies whose main activity is the production and sale of tradables. The second consists of nineteen firms which largely produce and sell non-tradables. A third group includes four holding companies which, due to the diversity of their activities, cannot be neatly classified as either tradable or non-tradable producers. The fourth group includes the seven privatised firms quoted on the BSE.

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IV

Capital Flows and Brazilian Economic Performance

Dionísio Dias Carneiro

ABSTRACT

Foreign capital flows found their way back into Brazil in the 1990s well before it controlled inflation, as part of the general resumption of such flows to developing countries. Brazil has come late to the increasing number of countries which, after decades of macroeconomic mismanagement,undertook stabilisation, liberal trade reforms and removal of state controls over the private economy, benefiting as well from foreign debt rescheduling under the Brady rules. Privatisation and trade reforms began in 1990 but successful price stabilisation started only in 1994. This chapter examines the role played by capital flows in the recent performance of the Brazilian economy, and the interplay between domestic policy uncertainty and the volatility as well as the abundance of the different types of capital flows in the 1990s. Its three main conclusions are that: *(1)* the high level of foreign exchange reserves strengthened the chances for stabilisation, *(2)* no significant difference in volatility existed between direct investment and purely financial flows at the peak of uncertainty, and *(3)* the taxation of excessive flows seemed sufficient to regulate rapid swings in the flows in the aftermath of the Mexican turmoil of 1994–95. As uncertainty derived from domestic policy diminishes and stabilisation seems more likely to last, the proportion of direct investment financing the current account deficit increases, but this offers no excuse for either postponing fiscal reforms or accepting a large overvaluation of the exchange rate.

Introduction

Significantly increased capital inflows transformed a Brazilian capital account deficit of 1.6 per cent of GDP in 1983–89 into a surplus of 2.5 per cent of GDP in 1990–95. Did the new volume of inflows come from asset holders seeking only quick gains from interest rate differentials far beyond perceptions of country risk, or has it become a reliable extra source of savings that will contribute to an increase in the country's growth prospects? A convincing answer to this question depends on judgements about (1) the elements behind these movements, acting on the supply and demand sides of the recent flows, as well as (2) the effects these elements may have on growth constraints: investment, saving and the foreign exchange constraints likely to bind Brazilian economic growth in coming years. This chapter examines some characteristics of the recent inflows against the background of past experience; it focuses on elements of the domestic policy uncertainty that has persisted in Brazil and which competes with the externally based volatility of capital as the main reason behind wild swings in the level of economic activity.

One striking feature behind the country's poor economic performance in the 1980s was the fall in the ratio of investment to GDP; measured at 1980 prices, the ratio dropped from a peak of 25.8 per cent in 1975 to an average of less than 15 per cent in the first half of the 1990s (Carneiro and Werneck, 1993). The investment/GDP ratio has recovered only slowly, from 14 per cent in 1992 to 16.6 per cent in 1995 and an estimated 17 per cent in 1996; thus one can hardly expect to find an overwhelming aggregate impact of recent capital flows on investment. Moreover, two facts deserve attention in interpreting the nature and the long run consequences of recent inflows. First, since Brazil has come late both to external debt rescheduling (the final Brady agreement was completed only in 1994) and stabilisation (the first successful attempt is now only two and a half years old), sufficient time has not passed for noticeable structural change in the quality of flows. Second, a significant rise in foreign direct investment — to $9.5 billion of net inflows in 1996 from $3.6 billion in 1995 and $1.7 billion in 1994 — remains too recent for a convincing evaluation of its effect on aggregate investment and saving.

The first section of the chapter describes the sources and composition of capital flows in 1990–95, in the context of historical experience. The second examines their determinants; it argues that despite the short run nature of capital flows in the first years when bonds and notes issued by financial institutions dominated, the balance of pros and cons pointed favourably, towards the accumulation essential to build a cushion of foreign exchange reserves that has helped Brazilian economic stabilisation policy. Brazilian policy makers provoked a credit crunch through record high reserve requirements and credit ceilings for the banking system, and managed to resist the turbulence that followed the Mexican devaluation of December 1994. The loss of foreign reserves reversed after April 1995. This victory over pessimistic expectations about stabilisation created room for a significant change in the pattern of capital flows, with a shift in favour of FDI. In principle this change should be beneficial because FDI flows normally are less volatile than purely financial flows. The third section

looks at the volatility of different forms of capital flows to Brazil and evaluates differences among investment flows — portfolio versus direct investment and total investment versus loans. The data suggest that the volatility of the flows measured by the coefficient of variation of monthly changes did not behave too differently during the early 1995 turbulence. The Brazilian government opted not to impose restrictions other than a tax on short-term capital used to purchase fixed-income securities and benefit from the extremely high interest rates that resulted from the credit crunch. Changes in this tax rate became its most important instrument to discriminate against hot money and favour capital flows of better quality. The fourth section describes the use of recent flows in the successive phases of the stabilisation effort: boosting government reserves, credit expansion and investment, high interest rates and exchange rate appreciation — a sequence resulting from the interplay between events in the international economy and incentives from governmental policies. The last section tries to draw policy lessons, taking account of the policy uncertainties, stemming from exchange rate overvaluation, little progress in the reduction of the consolidated public sector deficit and low aggregate investment, that prevail after two and a half years of successful monetary reform and de–indexation.

Foreign Capital and the Performance of the Economy

Since the first oil shock halted the high economic growth of the early 1970s, the availability of foreign finance has played a major role in the overall performance of the Brazilian economy as well as the economic policy choices available. Table 4.1 shows that the decrease in real GDP growth between 1975–79 and 1980–89, from an annual average of 5.9 per cent to 2.9 per cent, coincided with an increase in net factor payments abroad from 1.9 per cent to 4.5 per cent of GDP. By the end of the 1980s, unfavourable external economic relations had reduced the shares of consumption, domestic savings and gross fixed investment in current–price GDP.

The economic consequences of the failure of the two Collor stabilisation plans of March 1990 and February 1991 set the background for the crisis of 1990–93. Four–digit annual inflation reigned except during the short–lived *interregna* between the price explosions which followed general price freezes and de–indexation attempts, and real GDP plunged in 1990–92 by an accumulated 4.7 per cent[1]; real output recovered its 1989 level only in the first quarter of 1994. Lower GDP caused an even more dramatic loss in domestic consumption as high inflation promoted the regressive income transfers necessary to achieve trade surpluses high enough to close the balance–of–payments gap and recover the level of reserves (Carneiro and García, 1995).

Table 4.2 presents details of the Brazilian balance of payments for 1975–96. Between the Mexican debt crisis of 1982 and the end of the 1980s, current account deficits had to fall from an annual average of $9.4 billion in 1975–82 to $1.2 billion in 1983–89. Between 1983 and 1989, an average annual trade surplus of $12.4 billion emerged in response to this need to adjust the domestic economy to the overall foreign exchange constraint.

Table 4.1. **Brazilian National Accounts**

(annual averages, as a percentage of current-prices GDP)

	1975-79	1980-82	1983-89	1990-95	1990	1991	1992	1993	1994	1995
GDP (constant prices growth rate)	5.9	1.7	3.4	1.6	(4.2)	0.3	(0.8)	4.2	6.0	4.2
Net factor income/payments abroad	1.9	4.2	4.6	2.4	2.8	2.8	2.5	2.8	1.9	1.7
Net unrequited transfers	0.0	0.0	0.0	0.4	0.2	0.4	0.6	0.4	0.5	0.6
Gross national disposable income	98.1	95.8	95.4	98.0	97.4	97.6	98.1	97.6	98.6	98.9
Domestic consumption	78.6	78.5	75.8	78.9	76.6	79.2	77.6	78.5	79.2	82.1
Domestic savings	19.5	17.4	19.6	19.1	20.7	18.4	20.5	19.1	19.3	16.8
Gross fixed investment	22.5	23.5	21.6	20.7	22.9	19.2	19.5	20.0	20.8	21.6
Current account deficit	3.9	5.3	0.6	0.4	0.8	0.4	(1.6)	0.2	0.3	2.5

Sources: Banco Central do Brasil. IBGE and Carneiro & Werneck (1993).

Table 4.2. **Brazil: Balance of Payments, 1975-96**

(annual averages in $ billion)

	1975-79	1980-82	1983-89	1990-96	1990	1991	1992	1993	1994	1995	1996*
Trade balance	(1.9)	(0.3)	12.4	7.4	10.8	10.6	15.2	13.3	10.5	(3.4)	*(5.5)*
Financial services[a]	(2.5)	(8.9)	(9.6)	(8.3)	(9.7)	(8.6)	(7.3)	(8.3)	(6.3)	(8.2)	*(9.8)*
Services (others)	(2.5)	(4.5)	(4.1)	(7.5)	(5.6)	(5.0)	(4.1)	(7.3)	(8.4)	(10.4)	*(11.9)*
Current account	(6.9)	(13.6)	(1.2)	(6.2)	(3.8)	(1.4)	6.1	(0.6)	(1.7)	(18.0)	*(24.3)*
Capital account	7.5	10.1	(5.1)	14.7	(4.7)	(4.1)	25.3	10.1	14.3	29.4	*32.4*
Errors and omissions	(0.2)	(0.4)	(0.4)	0.2	(0.3)	0.9	(1.4)	(1.1)	0.3	2.1	*1.0*
Reserves (changes)[b]	0.4	(3.9)	(6.7)	8.6	(8.8)	(4.6)	30.0	8.4	12.9	13.5	*9.0*
Capital account (as % of nominal GDP)	4.5	4.6	(1.3)	2.6	(1.1)	(1.1)	6.8	2.4	2.5	4.1	*4.3*

* Preliminary.
a. Interests payments and estimates of arrears; excludes profits that are recorded in services.
b. Current Account + Capital Account + Errors and Omissions.
Source: Banco Central do Brasil – atualizado a partir do Boletim do Banco Central de Março de 1997.

The domestic investment pattern also changed dramatically from the 1970s to the 1980s (Table 4.3). Gross fixed investment in current prices decreased from an average of 22.5 per cent of GDP in the last five years of the 1970s to 18.9 per cent in 1984, whence it trended upward to a peak of 26.9 per cent in 1989, a surprising result in view of great uncertainty brought about by high inflation and three unsuccessful stabilisation attempts starting with the Cruzado plan. The constant–price series, supposed to be more accurate, reveals this recovery in investment as only apparent. Behind the contrast of the two series lies a sharp relative increase of capital goods and construction prices — a shift accounted for by high uncertainty about the legal value of contractual indexation following the Cruzado experiments and the increase in the relative price of imported capital goods. The latter reflected not only the devalued currency after 1983 but also the scarcity of credit from both suppliers and the official and multilateral sources which traditionally provided financial support to long-run investment projects.

Table 4.3. **Brazil: Gross Fixed investment, 1975-95**

	Gross Fixed Investment Curr. Prices (as % GDP)	Gross Fixed Investment Const. Prices (as % GDP	Gross Fixed Investment Const. Prices (1990=100)	Capital goods Imports (1990=100)
1975	23.3	25.8	103.4	66.3
1976	22.4	25.0	110.6	61.0
1977	21.3	23.6	109.3	52.3
1978	22.3	23.5	114.5	59.9
1979	23.4	22.9	119.0	63.6
1980	23.6	23.6	129.9	73.9
1981	24.0	21.6	114.1	67.8
1982	23.0	20.0	106.3	55.2
1983	19.9	17.2	89.0	42.2
1984	18.9	16.3	88.8	36.3
1985	18.0	16.4	96.6	41.8
1986	20.0	18.8	118.4	58.4
1987	23.2	17.9	116.8	66.7
1988	24.3	17.0	111.0	70.7
1989	26.9	16.7	112.3	82.1
1990	22.9	15.5	100.0	100.0
1991	19.2	14.6	94.2	100.7
1992	19.5	13.6	87.7	107.7
1993	20.0	14.0	90.3	145.5
1994	20.8	15.0	96.7	212.9
1995	21.6	15.4	99.3	298.1

Sources: IBGE – National Accounts Department, Banco Central do Brasil, IPEA and Carneiro & Werneck, (1993).

The savings side shows a picture no brighter, mainly because, without fiscal adjustment, public savings have not recovered from their slump in the 1980s. Severe cuts in public investment reduced the deficit. Public savings, which averaged 7.6 per cent of GDP in the 1970s, fell to –1.3 per cent by 1989. Abundant foreign funds had

financed the rise of both public and private domestic investment in the 1970s, but the contribution of foreign flows became very small in the 1980s and turned negative at the end of the decade. As foreign savings dropped, investment had to be financed by the domestic private sector, where high inflation prevailed and investors faced depressed domestic demand, with no foreign capital available during the long period of the external debt crisis.

The capital account deficit required current account surpluses at the end of the 1980s and in the early 1990s. Restrictive demand policies aimed at controlling domestic absorption reduced capacity use and investment, and thus sustainable economic growth. Lower savings and negative foreign transfers also limited investment; Brazil did not qualify for new balance-of-payments financing. With the suspension of debt–related payments under the official moratorium declared in early 1987, financial as well as real resource transfers became negative. With virtually no foreign exchange reserves, interest payments to private debtors came throughout the period as the trade surplus allowed — after profit remittances, which actually reached a record high level in the moratorium years and were supposed to encourage FDI.

Table 4.4 presents a breakdown of the balance-of-payments capital account since 1989. From 1989 to 1991 net foreign direct investment (FDI), including reinvestment, averaged less than $500 million per year. Foreign investment showed its first significant increase in almost ten years only after the enactment (31 May 1991) of a regulation known as Annex IV of resolution 1289/87 which permitted foreign investors to buy fixed income assets and thus opened wider room for portfolio investment (Carneiro and García, 1995). The attractiveness of high interest rates prompted a recovery in foreign exchange reserves after a sharp increase in domestic interest rates followed the real devaluation of September 1991. Since August 1993 (Res. 2013), money entering the country as portfolio investment can purchase stocks and bonds, depositary receipts or fixed income funds and privatisation funds; the last two are special funds constituted by privatisation monies, i.e. public debt which qualifies for the liquidation of purchases of state companies in privatisation auctions.

Capital inflows recovered at first with portfolio investment boosted by the enactment of Annex IV. Only institutional investors (financial institutions, insurance companies and foreign investment funds) may invest in Annex IV funds, through which they can acquire Brazilian stocks and derivative assets. In February 1996, foreigners were forbidden to buy privatisation securities directly through Annex IV operations, but they still can purchase them through privatisation funds, subject to a 5 per cent tax[2].

After the initial period (1991–92) when the inflow of capital was instrumental to the recovery of foreign reserves, the Central Bank imposed capital entry restrictions in the second half of 1993. At first, it taxed only fixed–income investments. In August 1995 the tax rose from 5 per cent to 7 per cent, with loans not related to trade paying a 5 per cent transaction tax upon entry; stock market investments remain untaxed. A very active market for derivatives, however, makes it hard to prevent foreign investors from flooding the country for a quick gain from very high real interest rates. To

Table 4.4. **Brazil:Balance of Payments – Capital Account 1989-96**

($ million)

	1989	1990	1991	1992	1993	1994	1995	1996
Capital account	(3 648)	(4 715)	(4 148)	25 271	10 115	14 294	29 359	32 391
Investment (net)	125	-	170	2 972	6 170	8 131	4 663	15 558
Reinvestment	531	273	365	175	100	83	384	447
Financing	3 640	3 424	2 026	13 258	2 380	1 939	2 834	4 302
Foreign	3 788	3 474	2 125	13 191	2 625	2 389	3 513	4 405
New inflows	2 257	2 662	2 125	1 608	1 435	2 389	3 513	4 405
Refinancing	1 531	812	-	11 583	1 190	-	-	-
Brazilian	(148)	(540)	(99)	67	(245)	(450)	(679)	(103)
Amortisations	(33 985)	(8 665)	(7 830)	(8 572)	(9 978)	(50 411)	(11 023)	(14 423)
Paid	(5 889)	(8 053)	(7 830)	(7 147)	(9 268)	(11 001)	(11 023)	(14 423)
Refinancing	(28 096)	(612)	-	(1 425)	(710)	(39 410)	-	-
Currency loans	25 972	(297)	964	17 577	11 659	53 802	33 570	26 797
Short-term	(1 664)	(1 208)	(3 033)	2 602	869	909	18 834	3 995
Long-term	27 636	911	3 997	14 975	10 790	52 893	14 736	22 802
Brazilian Banks	1 465	-	-	294	-	5 752	-	-
New inflows	-	-	-	294	-	-	-	-
Refinancing	1 465	-	-	-	-	5 752	-	-
Foreign commercial banks	26 065	-	-	7 703	834	38 758	1 737	811
New inflows	600	-	-	603	834	2 034	1 426	562
Refinancing	25 465	-	-	7 100	-	36 724	31	249
Intercompany	106	258	308	871	1 064	632	1 133	1 578
Other [a]	-	653	3 689	6 107	8 892	7 751	11 866	20 413
Other capital	69	550	157	(139)	(216)	750	(1 068)	(290)

a.   Including bonds, "commercial paper" and "fixed/floating rate notes".
Source: Updated from the *Boletim do Banco Central do Brasil*, March 1997.

circumvent taxes on fixed–income assets, the so–called box operation in the options market became one of the most widely used operations to transform an investment in stocks to a fixed–income investment. It involves a simultaneous trade of four options — two calls and two puts — that produces a return known in advance, just as on a bond. With arbitrage, this return must equal the interest rate. August 1995 brought a ban on box operations with foreign capital and Annex IV funds were prohibited from operating in futures markets.

Both the role and the composition of foreign currency loans have also shown significant change in recent years. Bonds and notes (with both fixed and floating rates) accounted for two–thirds of the inflows in 1995, in sharp contrast with the beginning of the 1990s when the dominance of commercial paper and intercompany credits restricted foreign borrowing mostly to foreign companies because of unsolved problems related to the Brady negotiations. Figure 4.1 exhibits the behaviour of inflows in these and other categories, according to Central Bank records. Bank–intermediated loans (operations under Resolution 63), the main instruments of the previous debt cycle, lost their importance. More recently, export–related securities, operations to finance agricultural activities (under Resolution 2148, with minimum maturity of 180 days) and funds to finance housing and other construction projects have gained more weight as the economy heads towards recovery. They amounted at the end of 1996 to about 17 per cent of total inflows.

The intermediaries for Annex IV portfolios include Brazilian banks as well as local subsidiaries of foreign banks, such as Citibank ($6 693 billion) and Chase Manhattan ($4 315 billion), according to December 1996 data. At the end of 1995, Brazilian banks administered 45 per cent of the total of 518 registered portfolios. Non–bank intermediaries such as brokers and special purpose funds had a 21 per cent share while pension funds covered only one per cent of the total.

Determinants, Timing and Composition of Capital Inflows

The change in the composition of foreign capital flows to Brazil reflected drastic changes in the macroeconomic environment in the 1990s. One cannot ignore the consequences of low policy credibility after the failure of stabilisation attempts during the Collor government. After the second price freeze in less than a year, the economic team had to accomplish three hard tasks to restore confidence in economic policy: liberalise prices, unfreeze assets that had been taken from their holders and recover external credibility. To face the hyperinflation menace expected to follow the increase in liquidity, macroeconomic policy required high interest rates and exchange rate devaluation. The reaction of foreign investors (including Brazilian holders of foreign assets) was highly positive; rising foreign reserves recovered the prospects for economic governance. This suggests that both the quantity and the quality of foreign finance responded to prospects of better quality in the conduct of macroeconomic policy well *before* actual results showed up[3]. The increase in portfolio investment also led the way to a rising share of FDI in total inflows.

Figure 4.1. **Currency Loans Disbursements and Amortisation Decomposition**

Currency loans disbursements decomposition

Currency loans amortisation decomposition
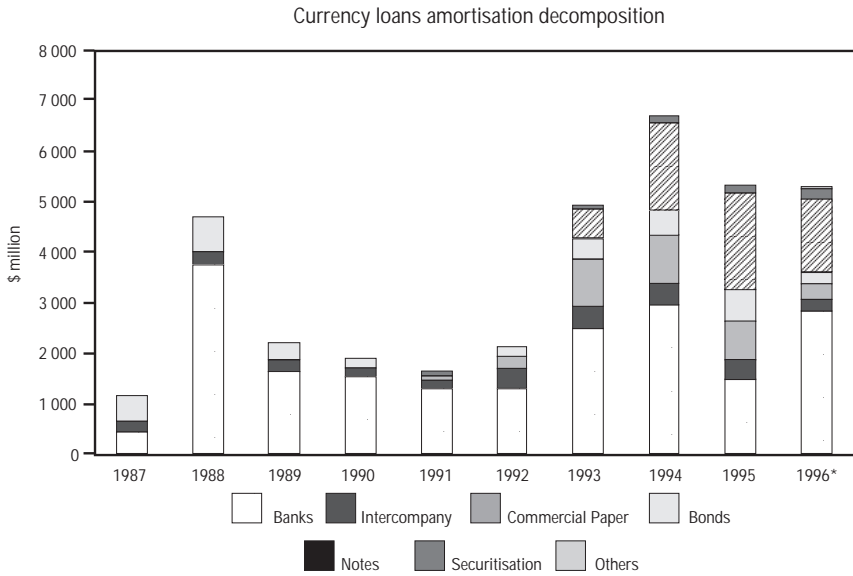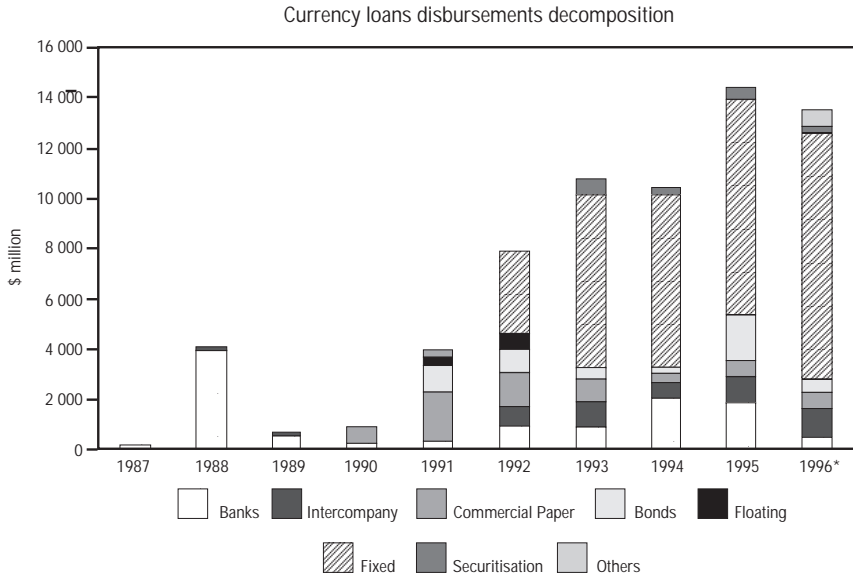
* Includes the flows until September.
Source: Banco Central do Brasil.

It is difficult to separate the positive effect of the reversal of the domestic outlook from that of the obvious improvements in the supply of funds. Despite growing international capital mobility since the 1970s, Brazil's share decreased significantly in the 1980s as failure to reschedule the external debt prevented it from drawing on the increase of flows to developing countries in the late 1980s and early 1990s. By the end of the 1980s, Brazil received less than 0.6 per cent of global FDI (14.6 per cent of the flows to Latin America), compared with 6.2 per cent at the end of the 1970s (30.5 per cent relative to Latin America) (Jaspersen *et al.*, 1995).

Following the serious reversal during the international debt crisis, the first half of the 1990s witnessed a substantial growth in cross–border capital flows, as dominant risks were perceived to be increasingly country–specific and no longer systemic. Three additional reasons may help to explain the higher volume of migrating capital: decreased costs of portfolio movements, the ability of fund managers to persuade investors of their expected gains and risks, and a trend to liberalise foreign exchange markets almost everywhere.

As a result, flows have become larger and more volatile, posing problems to monetary authorities in Brazil and elsewhere, given the disparities between the size of foreign exchange reserves in the vaults of Central Banks and the potential volume of capital available to cross foreign exchange markets. A good portion of the liberalisation wave may in turn result from the recognition by local authorities of their limited powers to deal with massive runs on their foreign exchange reserves. More liberal exchange policies usually mean more reliance on market–determined exchange rates and greater scope for domestically oriented monetary policy. Foreign exchange rate movements, however, can absorb a good deal of energy to prevent the development of short–run bubbles generated by the self–fulfilling prophecies common in foreign exchange markets. Relaxed exchange controls have made the country more attractive to foreign capital. At the same time the Brazilian government continuously displayed its belief that hospitality and steady rules breed confidence. Both have contributed to further enlargement of capital flows. Brazil nevertheless retains a formal dual exchange market, although the floating market rate's spread over the commercial rate, which applies to practically all transactions except the gold market, has been virtually zero for a long time. The existence of the dual market means that, in case of a massive run against the real, the Brazilian authorities may still allow the spread between the two rates go up, thereby creating a market–determined tax on capital flight.

A resumption of growth prospects is essential to enhance the expected profitability of new projects. High inflation meant permanent instability concerning basic rules and exchange rate prospects beyond the indexation rules (despite daily exchange rate indexation, for example, the real exchange rate was usually overvalued following inflationary upsurges). Timing and the propensity of foreign investors to wait and see seem essentially relevant to recent Brazilian experience; the share of FDI in capital flows after 1991 tends to corroborate this opinion. Finally, Brazil began to promote stabilisation very late compared with Chile, Argentina and Mexico. This delayed other reforms. The protraction of privatisation following the failure of the Collor stabilisation attempt in 1990 provides a good example. Yet it was widely believed that as soon as

the hyperinflation menace passed and the state reformed, a new phase of economic growth would follow, on the basic reasoning that the high uncertainty generated by macroeconomic instability and the hyperinflation threat placed a high risk premium on the decision to invest, especially in projects with long maturities.

Uncertainty and the Cost of Waiting

Recent approaches to the theory of investment (Pindyck and Dixit, 1994) emphasise the cost of waiting for a better opportunity as a determinant of investment outlays. This may help to throw some light on the determinants of FDI–related inflows compared to other forms of capital movements. The basic idea makes use of the option–pricing approach: if the potential investor postpones his time of entry, he pays for it because he still retains the option to enter later, when a less uncertain evaluation of the prospects for macroeconomic policies becomes possible. This section uses a simple model which Dornbusch (1990) employed to explain the risk premium for the Mexican economy following its stabilisation reforms. The model describes the relationship between an investor's beliefs concerning the future evolution of the rates of return in a risky economy and the premium he demands to invest immediately instead of waiting for more information. The probability distribution describing the possible future events in the uncertain economy represents the investor's beliefs; it usually is unobservable, but simplifying assumptions allow an explicit calculation of the relation between these beliefs and the risk premium.

The first assumption limits the range of possible rates of return during the life of the investment. The present case assumes two alternative states of nature: a good one, with policy reforms successfully implemented and the expected rate of return high (labelled r_g); and a bad scenario, with reforms only a promise and the expected rate of return low (labelled r_b). The investor can decide either to wait and apply his wealth abroad earning a known rate of return r, or realise a direct (irreversible) investment in this risky environment with two states of the world. At the moment of decision those brave enough to enter at early stages do so because they believe that they will reap good profits soon, because the good state lies just around the corner.

To determine the possible paths to be followed by the rates of return, assume that the investor's evaluation of states follows a Markov process. In a bad state there is a probability q of persistence and a probability $(1-q)$ of a shift to a favourable state. Thus, q can be interpreted as the probability of bad news and $(1-q)$ as the probability that successful macroeconomic policies will arrive and change the economic prospects. A further simplification: once this favourable state comes, investors expect it to last forever[4].

The relationship between the required premium and the investor's belief starts with the definition of this premium[5]. Starting at the bad state of the economy, the required premium for an investor with a belief in persistence of the present state q to go ahead and invest, instead of taking a "wait and see" position which maintains the option of entering once the favourable state is verified, is given by:

$$= [q / (1+r-q)] (r-r_b)$$

This confirms the so–called Bernanke's Bad News Principle that the option value of waiting depends only on the rate of return in the bad scenario, not on the good news. The size of the required premium thus depends only on the difference between the certain rate abroad *(r)* and the low rate of return of the uncertain economy, not on the difference between the certain rate and the high rate, because investors can always benefit from the good state if they wait for it to invest. The equation also states that the size of the premium required for an immediate commitment grows with the probability of persistence of the bad state.

Protracted Stabilisation and the Covered Interest Differential

Figure 4.2 shows an estimate of the covered interest differential (CID) and its components from February 1991 to December 1996. The estimate uses the interest rate on US Treasury bills; a riskless overnight monthly interest rate on Brazilian Federal bond–backed assets; and the expected rate-of-exchange devaluation on the BM&F exchange futures market, measured on the first day of each month. $CID = \{(1+RN)/[(1+E)(1+TB)] -1\}$, where *RN* is the domestic interest rate, *E* the expected devaluation in the futures market and *TB* the external interest rate. It represents a pure risk premium which depends on the probabilities of the different states of the economy.
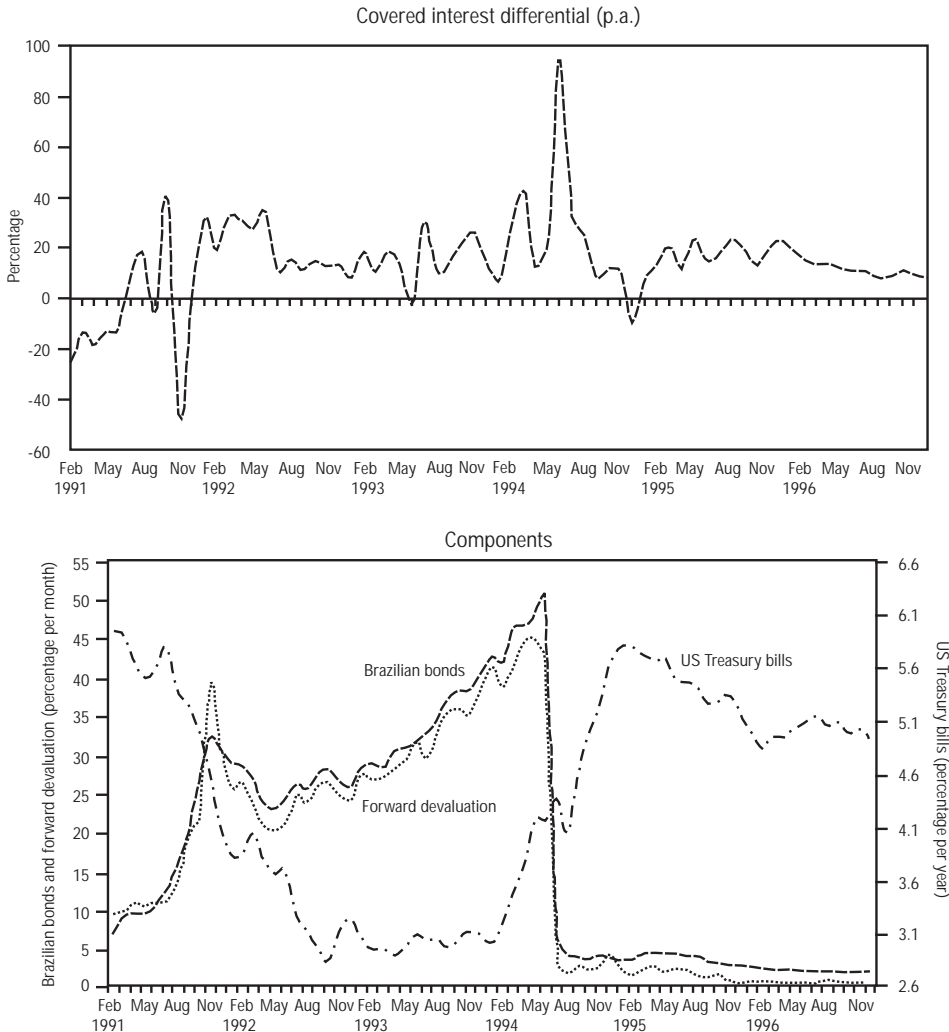
Using the assembled data on the risk premium and fixing r_g, r_b and *r*, the model gives estimates of the implicit degree of belief about future rates of return. This belief essentially reflects aggregate behaviour, the outcome of independent decisions. A preliminary exercise chose the US T–bill rate as the certain rate of return and, alternatively, zero and –40 per cent as the low rate of return — as just base line assumptions to analyse the probability of persistence of the bad scenario. Annex Table 4.A1 presents the results of this computation.

Quality of Capital Flows

To find an explanation for the timing of FDI inflows in the implicit probabilities of bad scenarios suggested by the evolution of risk premia is no trivial exercise. Repeatedly frustrated attempts at stabilisation caused, in each episode, postponement of the expected policy reforms that would have come with success. Confidence in domestic improvement has thus proved elusive several times, leading to a premium on the correct timing — but it is hard to obtain a reasonable estimate of the rate of return in the "bad state". The quality of flows should improve with the decrease in the probability of bad scenarios. Higher confidence in the progress of economic reforms thus should increase the share of FDI in total capital inflows. A comparison between the time path of economic policy and the behaviour of the quality of inflows should

then help assessment of the responsiveness of the flows to expectations about economic policy "fundamentals". Unfortunately, a homogeneous monthly series for the quality of flows starts only in 1992 (see Annex Table 4.A2). Regressions of different measures of the quality of flows on a rough estimate for the probability of the bad scenario obtained correct negative signs but non–significant coefficients with the data up to April 1996. These results appear in Annex Table 4.A3.

Figure 4.2. **Covered Interest Differential (CID)**

Covered interest differential (p.a.)

Components

Source: Banco Central do Brasil, Bolsa de Mercadorias Futuros and FED (St. Louis).

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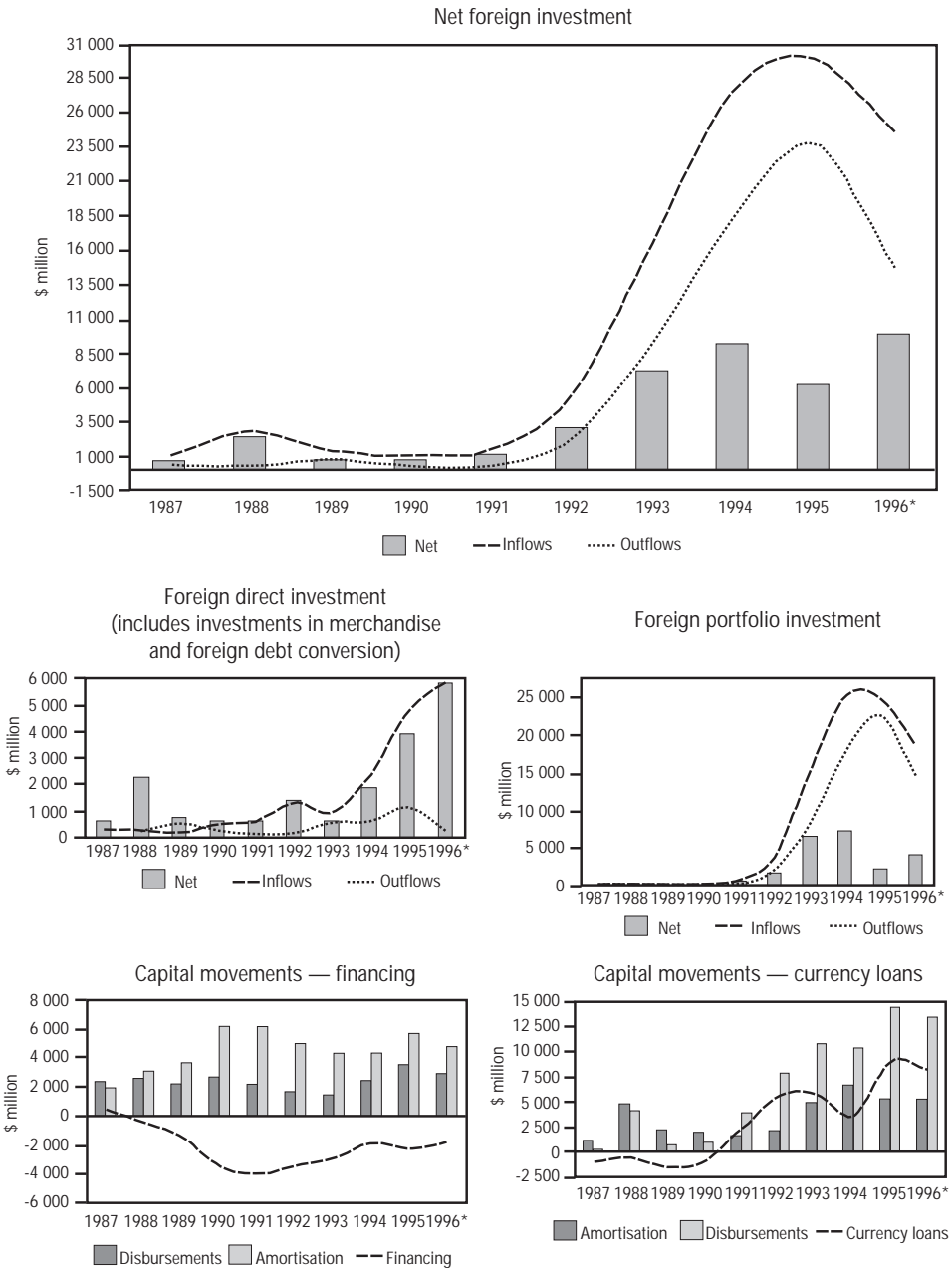**Volatility and the Response to Short–Run Incentives**

During and since the 1995 Mexican turmoil, the Brazilian authorities have not shied away from frequent changes in policy legislation, especially taxation and other regulations on short term capital[6]. This section addresses the extent to which aggregate flows responded to overall changes in the environment, short–run incentives and changes in the rules. When monetary reform was implemented in July 1994, the sudden lowering of expected inflation boosted the demand for credit and the government announced a very restrictive monetary policy based on high primary interest rates and increased bank reserve requirements to prevent too rapid expansion of the money supply and higher expected inflation. In October 1994, two months before the Mexican peso was floated, the government took several measures to control excessive capital inflows motivated by the increase in domestic interest rates. During an import boom with abundant external funds to finance it, Central Bank foreign exchange reserves remained practically constant between June and November, despite increasing domestic interest rates, thanks to the restrictions on foreign capital. The tax on financial operations applying to currency loans went from 3 to 7 per cent and the minimum maturity of foreign loans from 90 to 540 days. For the first time, portfolio capital became subject to a tax of one per cent. Reserve requirements against trade credits included 15 per cent on export loans and 30 per cent on import credits.

Following the uproar caused by the devaluation of the Mexican peso after 19 December, outflows of foreign capital became dominant in all categories and reserves started to deteriorate. The government decided to reverse the overvaluation of the real which had served as an instrument for de–indexation in the second half of 1994. At the same time, it removed several restrictions on foreign capital, extinguishing the taxes on portfolio capital and foreign currency loans and reducing minimum maturities to 36 months for new loans and six months for renewals.

In the first quarter of 1995 these policy measures, coupled with another round of domestic credit restrictions based on higher reserve requirements against sight as well as time deposits and even bank loans (Carneiro and García, 1995), led to higher interest rates and a gain in reserves from around $30 billion in April to $46 billion by the end of the third quarter. From August onwards, the tax on fixed income investments returned to 7 per cent; loans were taxed at 5 per cent with a scale declining according to maturity to zero for loans of six years or more. All other financial instruments used to intermediate capital inflows became subject to a 5 per cent flat entry tax in February 1996.

This experience with the use of different domestic incentives in order to control capital flows is rich. In order to assess what happened to the volatility of the different types of capital flows, Figure 4.3 presents five panels. The first summarises the behaviour of net foreign investment in Brazil in 1987–96, shown in net terms and separated into inflows and outflows. The four smaller panels show the decomposition of foreign investment into FDI (including merchandise flows and foreign debt conversion which do not require foreign exchange transactions), portfolio investment, financing operations and currency loans. The figure shows all four components in net

Figure 4.3. **Net Foreign Investment**
(includes decomposition of inflows and outflows)

Net foreign investment

Net ▭ Inflows – – Outflows ·····

Foreign direct investment
(includes investments in merchandise
and foreign debt conversion)

Net ▭ Inflows – – Outflows ·····

Foreign portfolio investment

Net ▭ Inflows – – Outflows ·····

Capital movements — financing

Disbursements ▭ Amortisation ▭ Financing – –

Capital movements — currency loans

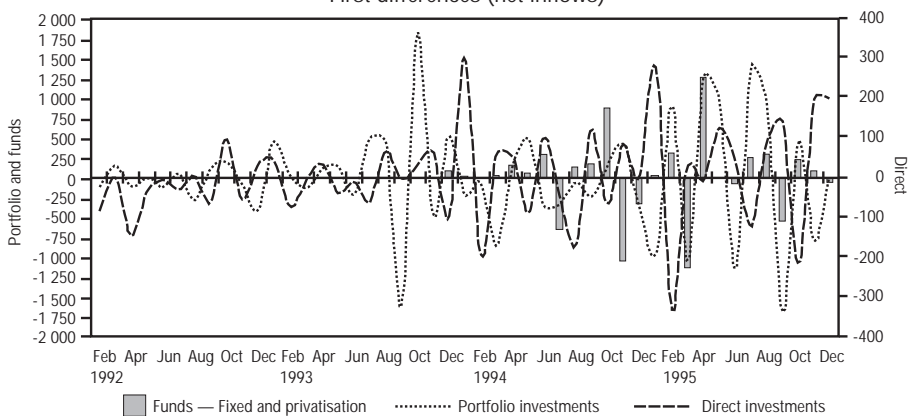

Amortisation ▭ Disbursements ▭ Currency loans – –

* Includes the flows until September.
Source: Banco Central do Brasil.

terms and separates them into inflows and outflows for each period. It reveals that the large movements of portfolio investment following deregulation dominated, in annual data, the upsurge of foreign capital in the first half of the 1990s. FDI increased after 1993. Amortisations of external debt largely controlled financing operations. Currency loans revived after 1991 in a clear response to higher domestic interest rates.

Figure 4.1 shows the decomposition of currency loans into bank and intercompany loans, commercial paper, bonds and notes (with fixed and floating rates) and securitised export financing operations. The upper part of the figure decomposes disbursements and the lower panel does the same for amortisations. Securities–backed operations replaced in the 1990s the bank–intermediated currency loans dominant in the previous debt cycle, with an increasing role played by fixed–rate notes and bonds. The pattern of amortisations clearly exposes the scars of the previous cycle.

Figure 4.4 addresses the issue of volatility in the short run with data describing the behaviour of monthly changes in the net flows between January 1990 and June 1996. The data divide into three types of net flows: FDI, portfolio investment and funds (fixed income and privatisation). Fixed income funds are included separately because, as explained earlier, most portfolio investment was confined to these funds after 1994. Simple inspection of the graph suggests that the volatility of all three categories increased in periods of high uncertainty related both to domestic policy changes and to changes in the external environment. The domestic situation ruled in late 1993 when portfolio investment reacted wildly to expected changes in the rules, and in early 1994 when FDI inflows reacted to uncertainties related to the multi–stage stabilisation programme[7] then being enacted by the government. The external environment held sway at the time of high uncertainty between the Mexican devaluation of December 1994 and the second half of 1995.

Figure 4.4. **Volatility**
First differences (net inflows)

Feb Apr Jun Aug Oct Dec Feb Apr Jun Aug Oct Dec Feb Apr Jun Aug Oct Dec Feb Apr Jun Aug Oct Dec
1992 1993 1994 1995

Funds — Fixed and privatisation ⋯⋯ Portfolio investments – – – Direct investments

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Tables 4.5 and 4.6 present volatility estimates measured by the coefficient of variation of monthly flows, with separate measures for inflows, outflows and net flows to check for potential differences in entry and exit behaviour. Foreign investment is classified as portfolio (fixed–income funds and privatisation funds included) and direct (merchandise inflows and reinvestments)[8]. The coefficients of variation cover the whole period as well as each year.

Table 4.5. **Brazil: Volatility of Foreign Investment**[a]

(Monthly flows - Coefficient of variation)

	Portfolio			Direct			Merchandise	Reinvestment
	Inflow	Outflow	Net inflow	Inflow	Outflow	Net inflow	Inflow	
1990	0.88	1.68	2.25	0.98	1.52	2.60	0.40	0.81
1991	0.71	1.42	0.62	0.66	0.87	0.93	0.41	0.92
1992	0.33	0.65	1.13	0.88	1.07	1.07	0.63	1.28
1993	0.58	0.64	1.06	0.60	1.20	1.19	1.79	0.59
1994	0.28	0.43	0.89	0.39	0.69	0.52	1.14	0.97
1995	0.40	0.38	6.02	0.50	0.69	0.52	0.82	1.32
1996[b]	0.23	0.17	1.22	0.70	0.75	0.72	0.85	1.47
1990-96	0.97	1.09	2.18	1.34	1.26	1.60	1.05	1.46

a.   Includes transactions not realised through the foreign exchange markets.
b.   January 1996 – June 1996.

Source: Banco Central do Brasil.

Table 4.6. **Brazil: Volatility of Currency Loans**

(Monthly flows – coefficient of variation)

	Total	Com Firce # 10	RES #30	Fin Rural Res 2148	Fin Imobil Res 2170	Comercial Papers	Bônus e Notes	Securitiz.	Renov.
1992	0.366	0.350	1.027	-	-	0.801	0.589	2.486	1.257
1993	0.506	0.425	1.200	-	-	0.706	0.649	1.282	0.851
1994	0.549	0.840	1.698	-	-	0.540	0.710	1.257	0.678
1995	0.682	0.675	1.057	1.467	-	1.234	0.979	1.741	0.858
1992-96	0.629	0.806	1.219	2.567	7.211	1.216	0.809	1.758	1.008

Source: Banco Central do Brasil.

For the monthly flows in each year and for the period as a whole, portfolio inflows present the smallest coefficient of variation (0.97 per cent) among the various forms of foreign investment, but FDI turns out to be less volatile in terms of net inflows. The data for inflows corresponding to loans shown in Table 4.6, however, bear a coefficient of variation of 0.63 per cent for the period as a whole, less than that observed for direct investment. A look at the variability of changes in monthly flows

(not reported in the tables) shows the volatility of net FDI flows as smaller (12.7 per cent) than that of portfolio investment (271 per cent), which holds true for almost every year of the sample. One surprise lies in the relatively high volatilities of merchandise inflows and reinvestment, two forms of FDI which do not involve cash flows and therefore do not have a direct impact on foreign exchange markets. Other features involve the relatively high volatility of export–related securities and the rather moderate increase in the volatility of bonds and notes; they signal that, after all, changes in regulations and tax rates applying to the different types of capital flows appear to have helped smooth differences in volatility. On balance, all the comparative data on volatility suggest that the differences in behaviour (and in eventual macroeconomic effects) between "purely financial" investment and direct investment more committed to the long-run determinants of the economy are, at least for Brazil in the 1990s, less pronounced and more subtle than one at first expects.

Consequences: Short- and Long-Run Effects

The traditional argument for the desirability of foreign investment stresses its expected boost to growth without increasing domestic saving requirements. Two important characteristics of recent higher capital flows to developing countries include, first, their supply–determined character (Calvo, Leiderman and Reinhardt, 1996) derived from lower interest rates in industrialised countries and, second, that financial motives dominate on the demand side. Does the greater importance of monetary inflows relative to FDI in Brazil lead to the conclusion that the unwelcome effects of capital inflows on monetary expansion and exchange–rate appreciation overshadowed their expected impact on real investment? Elements of the recent Brazilian experience suggest that domestic conditions have played an important role in the level as well as the composition of capital flows. Moreover, without the benefit of previous reserve accumulations, the stabilisation programme would have had small chance to overcome the shockwave set off by the Mexican devaluation crisis. Finally, a certain similarity of behaviour between the two types of flows emerges from the time–series evidence.

Table 4.7 presents FDI and other forms of foreign capital inflow (the latter classified as short–term and long–term according to the Brazilian balance of payments criteria) relative to GDP for 1989–96, with corresponding annual averages for 1964–70, 1971–80, 1981–91, and 1992–96. Taking a long-run perspective, both periods of high turbulence, namely the mid–1960s and the 1980s were also periods of low foreign capital inflows. Between 1964 and 1970, short–term capital flows amounted to 0.2 per cent of GDP and long–term flows corresponded to 2 per cent of GDP. These figures increased respectively to 0.6 per cent and 5.4 per cent in the 1970s, and declined to –0.1 per cent and 2.7 per cent in the 1980s. In 1992–96, they moved to 0.6 per cent and 4.4 per cent of GDP respectively, with FDI reaching a very high average in historical terms. The annual data tend to confirm these observations when the recovery of more favourable prospects opened the way to larger capital inflows in recent years.

Table 4.7. **Foreign Investment in Brazil, 1989-96**

(as % of GDP)

	Foreign Direct Investment	Short-Term Foreign Capital	Long-Term Foreign Capital[a]
1989	0.0	0.2	0.5
1990	0.0	-0.4	1.1
1991	0.1	-0.8	1.0
1992	0.3	0.7	4.0
1993	0.1	0.2	2.5
1994	0.3	0.2	9.4
1995	0.5	2.6	2.1
1996	1.2	0.5	3.0
Average 1964-70	*0.3*	*0.2*	*2.0*
Average 1971-80	*0.7*	*0.6*	*5.4*
Average 1981-91	*0.5*	*-0.1*	*2.7*
Average 1992-96	*0.5*	*0.8*	*4.2*

a.   Long-term includes here investment in stock markets.

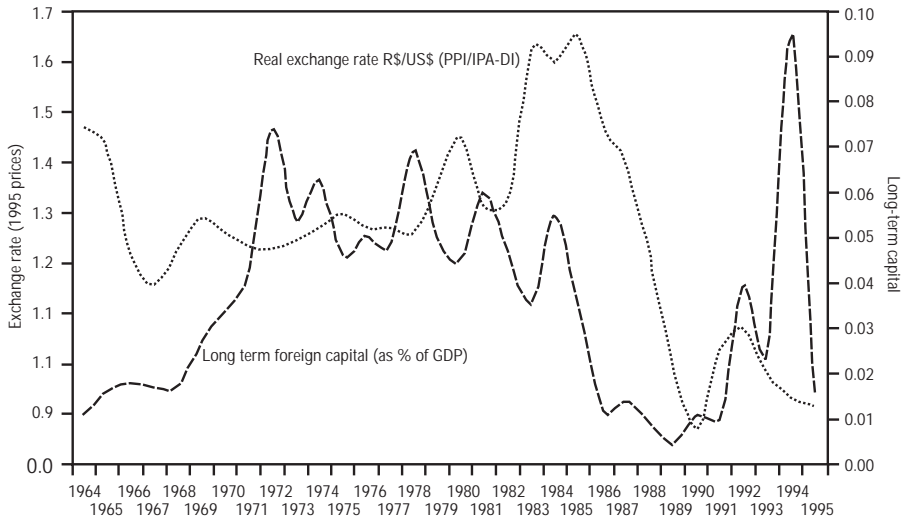*Source:*   Banco Central do Brasil.

Long–Term Capital and the Real Exchange Rate

The two undesirable effects of excessive capital inflows include the expansionist monetary effects of reserve accumulation and pressures tending to overvalue the exchange rate. The author has elsewhere described extensively the monetary effects of recent capital flows, with two main conclusions. The first relates to the advantages of a "security" effect from Central Bank reserves. The second notes a fact: Brazil actually had scarcely any mopping up of excessive monetary base through traditional "sterilisation" operations. In the high–inflation monetary regime with daily indexation, foreign capital in excess of current account needs entered the country to take advantage of the high interest paid by government securities, while nominal domestic interest rates were at first determined by the need to offer asset holders an alternative to foreign assets in order to set a limit to currency substitution (Carneiro and García, 1995, p. 18). After the monetary reform, they were used to punish speculation against the new currency.

Overvaluation pressures may have been very important in short–lived episodes. Estimates of overvaluation (the general price index relative to US consumer prices), based on peak–to–trough measures following the monetary reform, reached 24 per cent in the first six months of the programme, leading prominent analysts to predict a collapse of the exchange rate as inevitable in the first half of 1995. Because of wild changes in relative prices following stabilisation, the overvaluation measured by non–agricultural wholesale prices for the same period was practically nil. Most calculations, however, tend to overlook that under high inflation small lags in daily indexation may produce large differences between the real value of the exchange rate at the end of the month and its average monthly value. This leads to an overestimate of the real exchange rate prevailing before the programme and thus to a corresponding exaggeration of the overvaluation.

A longer look, however, exhibits a different aspect because some degree of appreciation is associated with higher long-term capital inflows, both being perhaps a signal of "good times". Table 4.8 presents a series for the Brazilian real exchange rate side–by–side with a measure of long–term capital as defined in the balance of payments statistics, expressed as a percentage of GDP. Figure 4.5 pictures the data. The long-run association between the level of the real exchange rate and the amount of long term capital shown in the graph would argue more in favour of jointly determined phenomena than for causality[9]. Table 4.9 reports results of recent research conducted under the author's supervision, in which a co–integration regression is estimated for the real exchange rate using three different deflators, with a consistently negative sign for the effect of long–run capital flows on the real exchange rate. This conclusion certainly does not imply that one should not worry about overvaluation effects from excessive and short–lived capital inflows, but it does underscore the importance of analysing the quality of flows when assessing the utility of restricting capital inflows.

Figure 4.5. **Real Exchange Rate and Long-term Foreign Capital**

Source: Banco Central do Brasil.

Table 4.8. **Real Exchange Rate and Long-term Foreign Capital, 1964-96**

	Real Exchange Rate R$/$[a]		Long-term Foreign Capital[b] (as % of GDP)
	Wholesale Price Index (IPA -DI)	General Price Index (IGP - DI)	
1964	1 870	2 102	1.1
1965	1 843	2 027	1.6
1966	1 579	1 763	1.8
1967	1 486	1 635	1.7
1968	1 578	1 720	1.7
1969	1 659	1 792	2.8
1970	1 622	1 752	3.4
1971	1 588	1 730	4.2
1972	1 580	1 728	7.4
1973	1 600	1 756	5.4
1974	1 633	1 798	6.3
1975	1 671	1 839	4.6
1976	1 637	1 791	5.1
1977	1 634	1 763	4.8
1978	1 625	1 754	6.9
1979	1 741	1 896	5.1
1980	1 913	2 177	4.5
1981	1 680	1 943	6.0
1982	1 705	1 958	4.6
1983	2 094	2 487	3.5
1984	2 060	2 562	5.5
1985	2 122	2 630	3.4
1986	1 899	2 309	1.2
1987	1 812	2 120	1.4
1988	1 607	1 905	0.9
1989	1 385	1 615	0.5
1990	1 090	1 279	1.1
1991	1 308	1 503	1.0
1992	1 400	1 582	4.0
1993	1 289	1 436	2.5
1994	1 119	1 194	9.4
1995	1 000	1 000	2.1
1996	1 054	1 008	3.0

a.   US prices deflated by PPI (1995=1).
b.   Long-term includes here investment in stock markets.
Source: Banco Central do Brasil FGV and FED St. Louis.

Table 4.9. **Real Exchange Rate Co-integration Regressions**[a]
(Annual date; 1964-95)

|	Wholesale Prices	General Prices	Consumer Prices
Intercept	6.63	6.78	8.09
	(-1.23)	(-1.85)	(-2.23)
Government Expenditure)	-0.80	-0.88	-0.77
(% GDP	(-0.18)	(-0.30)	(-0.33)
Long-Term Foreign Capital	-0.02	-0.04	-0.05
(% GDP)	(-0.01)	(-0.01)	(-0.02)
Openess (Degree of)	0.23	0.33	0.34
	(-0.16)	(-0.24)	(-0.30)
Terms of Trade	-0.06	-0.07	-0.43
	(-0.09)	(-0.13)	(-0.17)
Adjusted R^2	0.75	0.62	0.59
Durbin-Watson	1.85	1.78	1.72
Lyung-Box Q	6.53	3.00	6.85
ADF on residuals[b]	-4.11	-4.38	-4.09

a.　　　　Standard errors in parenthesis.
b.　　　　The Mackinnon critic values (at 5 per cent and 10 per cent of significance) are -4.46 and -4.08.

Capital Flows and Consumption versus Investment

Only in the past two years may one have had more concrete reasons to believe in a favourable change in the growth prospects of the Brazilian economy — prospects that could justify an improvement in investors' views of expected profitability and the degree of riskiness. Thus, any assessment of the consequences for investment, savings and growth must remain premature and precarious. In the first months of the real monetary reform, the availability of foreign sources of finance for consumer credit actually enhanced the consumption boom, but the effects of foreign capital abundance were believed to be more positive than those of a possible round of capital flight[10]. Figure 4.6 shows the behaviour of aggregate domestic saving, investment and the supply of credit to households by the banking system. Consumption, credit and foreign investment all grew in the same direction from 1990 to 1994. During the 1995 recession, the graph suggests that the increase in aggregate investment went ahead despite the slowdown of consumption and savings. A significant improvement in the quality of capital inflows and a 12 per cent increase in capital goods imports over 1995 accompanied the 1996 recovery in consumption and GDP, but data on overall investment remain unavailable[11].

Figure 4.6. **Domestic Savings, Gross Fixed Investment,
Domestic Credit to Individuals and Foreign Investment** ($ million)
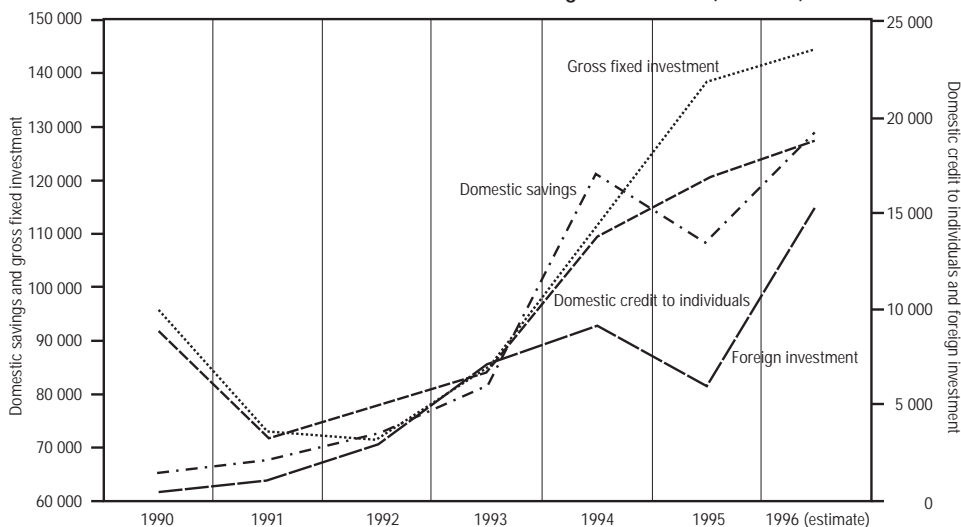
Sectoral Destinations of FDI

A brief look into the sectoral destinations of FDI shows the share of manufacturing falling from the late 1980s (71 per cent) to the mid 1990s (55 per cent). Services attract an increasingly higher share of foreign capital, reflecting a number of phenomena. One involves the internationalisation of a traditional "nontradable" sector through widespread franchising. Another reflects the opening of contracting, building, technical consulting and computer–related businesses, and more recently of insurance, traditionally protected until the late 1980s. FDI will respond to the further effects of privatisation and structural change within the subsectors of manufacturing. These reflect both the consequences of more liberal trade policies (the end of prohibitions, lower import tariffs) and deep changes in industrial policies (such as the end of nationalisation requirements in value added and of overall discrimination against foreign firms, which was banned from the Brazilian constitution only in 1995). The FDI upsurge of the last three years has entailed a noticeable increase of FDI in transport equipment and a decrease in tobacco. As the privatisation programme reaches electric power generation, telecommunications and state banks, a new wave of foreign capital likely will materialise in 1997–98. Even with the present upsurge, however, FDI flows in 1996 represented only 1.2 per cent of GDP and about one–fiftieth of gross capital formation.

Conclusions and Policy Issues

Brazilian experience is rich and varied. In the past, nationalism, control of capital flight and dirigist industrial policy ruled. The more recent stance lies somewhere between Mexican capital account liberalisation coupled with the uncertainties derived from flexible exchange rates and Argentina's fixed exchange rate with full convertibility. In both cases, and in Brazil, fiscal discipline seems essential to signal more favourable scenarios; yet it is the hardest to accomplish.

What policy lessons can one draw on how to prevent capital from flooding the country in good times and fleeing it in bad times? Capital flight was low before 1986, even in the worst times of the early 1980s — but it also was much milder in 1995 than in 1982, notwithstanding the liquidity of more recent investment. At the time of the first Mexican crisis external debt was public, with foreign money tied to long–run investment projects, but this does not mean that industrial policies make flows more stable, as the behaviour of the different types of flows examined in this chapter has shown. In the late 1980s, external moratorium plus domestic uncertainty with high inflation increased capital flight. Frustrated stabilisation attempts and delay in external debt restructuring lay mainly behind radical changes in attitudes in the early 1990s. Financial openness in neighbouring countries did make a difference; so did the abundance and composition of external funds. At the peak of high uncertainty, after President Collor's hijacking of domestic financial assets, liberalisation of the rules together with high interest rates furnished the essential elements for the reconstruction of economic policy credibility and stabilisation, but abundant external liquidity helped considerably; the existence of private capital ready to respond to inconsistent macropolicies should not be seen as a bad thing.

Another difficulty faced by regulators today derives from the interplay between supply–side determinants and the availability of financial innovations. With today's facilities to move money to financially open neighbour economies (Paraguay and Uruguay), the inefficiency of old fashioned controls becomes clear. Conflicting objectives, such as "to control volatility while minimising obstacles to capital mobility" (because these obstacles may have negative effects on long term flows) will inevitably taint the issue of what kind of controls to adopt.

On the issue of overvaluation effects, the Brazilian government adopted a more pragmatic exchange–rate policy following the Mexican crisis of 1994/95, with one eye on the need to discourage volatile short-term capital and the other on the trade balance prospects. At the start, this policy raised fears of catastrophe for stabilisation; they did not materialise. Under the present regime, the Central Bank has adopted a floating band which it has adjusted upward twice in the past two years[12], with frequent interventions to keep the exchange rate within a narrower "informal crawling band" that slides roughly at a rate implying moderate but steady real devaluation. This aims to exorcise fears of a big devaluation while it has prevented systematic appreciation. Thus far, long–term investors have seen this foreign exchange policy as sensible, although exports have grown slowly. That this attitude was adopted after the Mexican

crisis suggests some "latecomer" advantage. Improving permanently the quality of capital flows apparently requires more than sensible macropolicies, namely a more permanent and consistent stance concerning the role of the private sector in the investment process as a whole.

Brazil in recent years has attacked with a clear preference for taxation the dilemma between taxing highly volatile capital flows and forbidding them. Because high interest rates are the main reason for excessive inflows, taxing extraordinary gains may suffice to control them as it did, for example, in the second half of 1995 and the first half of 1996. There is no evidence that such policies resulted in an insufficient level of Central Bank reserves.

Investment performance since the recovery began is hard to assess. Aggregate investment responds in the long run to foreign capital, but overall economic incentives have affected both, by and large, in the past four decades. Signs have appeared that the uncertainties of 1995 adversely affected investment recovery, and preliminary estimates point to a slow increase in the investment-to-GDP ratio in 1996; increased capital inflows thus can hardly be associated with investment recovery in the first two years of the Brazilian stabilisation, but they may have helped to sustain a higher level of consumption expenditure and a higher fiscal deficit than those sustainable with continuous low inflation. The high level of the fiscal deficit, now around 6 per cent of GDP, does not provide an adequate environment for sterilised intervention as recommended in other circumstances[13]. Finally, policy discussions of the appropriate degree of government intervention to boost foreign capital inflows to preferred sectors have become frequent, as the current account deficit is expected to worsen in coming years while the quality of flows has improved. Resorting to such more restrictive policies, besides being no substitute for sound fiscal policies, may open the way for the restoration of the unfortunate respectability of capital controls. The debate has often involved arguments about discrimination in controls "by type" of capital, or "by sector of destination", with increasing pressures for an official industrial policy; these ideas certainly will appear in more respectable clothes whenever balance–of–payments difficulties arise.

Notes

1. Because of the slowdown in investment in the preceding decade and output growth rates well below the trend of the previous 40 years, GDP gap estimates differ too much, depending on assumptions about what happened to investment productivity, but output was well below capacity even before the fall in GDP in the 1990–93 crisis. See Abreu, Carneiro and Werneck (1996) for a discussion of the long–run constraints on Brazilian economic growth.

2. Such securities have long maturities compared with ordinary Central Bank Bonds or Treasury Notes and since they are sold at high (and volatile) discounts, they offer excellent prospects of returns for those investors either willing to hold them to maturity or interested in participating in privatisation auctions. Restrictions applying to them in times of abundant supply of funds provide an example of the government's difficulties in dealing with the fungibility of foreign flows when it tries to discriminate between "long" and "short" term capital.

3. García and Barcinski (1996) find that statistically significant coefficients of the interest rate differentials are sufficient reason to attribute to them the main explanation for the net inflows.

4. A more difficult assumption needed in the present interpretation is that this process repeats itself at each point of decision. Each investor is understood to have his own belief about the future evolution of the rates of return; differences between economic agents reflect their private sources of information and particular ideas about the environment; and they make their decisions separately. Finally, investors are assumed to be risk–neutral, so that they differ only with respect to their assessment of the most convenient time of entry. The point is further explored in Carneiro and Pierotti (1997).

5. The required premium is defined as the difference in return between the expected present value of the two possible investment opportunities (waiting versus commitment). A simplifying assumption behind the implicit probabilities is of a time–invariant r_b so that the same game is repeated with the same payoffs, which is patently inadequate for a long period when some opportunities are lost.

6. See García and Barcinski (1996) for an updated description of the legislation.

7. Ouflows of FDI have been volatile in some instances because of profit and principal remittances, which tend to behave procyclically.

8. The Central Bank does not publish separate data for merchandise and monetary flows, but for the 1990s it was possible to have a series in order to check whether merchandise flows and reinvestment exhibited different volatilities, since most restrictions aimed at reducing the volatility of capital flows apply only to financial flows.

9. Actually, both series were found to be *I(1)*; Granger–causality tests applied to the two variables failed to reject the absence of Granger–causality.

10. In the six months of the programme (the second half of 1994), there was no attempt to avoid exchange rate overvaluation, since the government thought it helped to evade the probability of a speculative attack against the real leading to a devaluation that would put an end to the stabilisation effort. Thus, the costs associated with an overdose of foreign capital were very small compared with the risk of expectations of a sharp devaluation and with the explosion of domestic consumption.

11. Although official figures are still not available, unofficial estimates point to an investment ratio of 17.1 per cent at 1980 prices.

12. As of February 1997, the managed float is subject to a band between a minimum of 1.05 and a ceiling of 1.14 reals per US dollar.

13. See Reisen (1996) for an overview of the recommendations concerning sterilised interventions, which includes a generalised form of sterilisation through the use of excess public savings. In the Brazilian case, the government has managed to make use of compulsory holdings of public bonds by official pension funds and imposed reserve requirements on investment funds which have similar effects, but this obviously is not feasible when the Treasury's growing financial needs crowd out the Central Bank, leaving scarcely any room for sterilised intervention through the use of long–term savings.

Table 4.A1. **Covered Interest Differential (CID) and the Probability of a Persistent Bad Scenario**
(percentages)

	US T.bills*	Braz. bonds**	Devaluation***	CID	Q(0)****	Q(-40)
Jan-92	0.31	29.06	25.72	31.94	92.69	43.76
Feb-92	0.31	28.76	26.50	19.15	86.50	31.57
March-92	0.33	26.86	23.49	32.81	92.62	44.42
April-92	0.31	23.92	20.75	31.51	92.61	43.43
May-92	0.30	22.99	20.17	27.44	91.46	40.00
June-92	0.30	24.28	20.87	34.61	93.68	45.83
July-92	0.27	26.22	24.80	10.88	79.36	20.75
August-92	0.26	25.64	23.83	15.39	85.66	27.12
Sept-92	0.24	27.66	26.18	11.69	82.11	22.02
Oct-92	0.23	28.17	26.41	14.76	86.25	26.35
Nov-92	0.26	26.40	24.84	12.50	82.44	23.18
Dec-92	0.27	25.91	24.27	13.40	83.09	24.42
Jan-93	0.25	28.51	27.34	8.26	75.19	16.58
Feb-93	0.24	28.91	26.83	18.11	88.53	30.54
March-93	0.24	28.36	27.01	10.29	79.91	19.90
April-93	0.24	30.54	28.38	18.76	89.16	31.31
May-93	0.24	30.90	29.31	12.45	83.18	23.13
June-9	0.25	31.91	31.81	-2.13	-226.73	-5.36
July-93	0.25	32.73	29.44	31.12	93.85	43.24
Aug-93	0.25	34.64	33.18	10.63	80.07	20.40
Sept-93	0.24	37.23	35.49	13.23	84.14	24.24
Oct-93	0.25	38.40	35.87	21.06	90.04	33.86
Nov-93	0.26	38.38	35.36	26.39	92.22	39.15
Dec-93	0.25	40.41	38.49	14.44	84.96	25.88
Jan-94	0.25	42.76	41.57	7.35	73.01	15.03
Feb-94	0.26	41.99	38.82	27.05	92.26	39.74
March-94	0.29	46.43	41.74	42.74	95.64	51.29
April-94	0.31	46.50	44.60	12.73	80.18	23.38
May-94	0.34	47.94	44.93	22.82	88.03	35.48
June-94	0.34	50.60	42.00	94.41	99.76	70.97
July-94	0.36	6.88	3.98	33.28	92.22	44.73
August-94	0.33	4.16	1.80	26.46	90.24	39.05
Sept-94	0.38	3.81	2.70	8.70	68.23	17.06
Oct-94	0.40	3.61	2.25	11.67	73.65	21.62
Nov-94	0.43	4.06	2.72	11.06	71.37	20.67
Dec-94	0.46	3.78	4.20	-9.78	100.00	-28.81

Table 4.A1. (continued and end)

	US T.bills*	Braz. bonds**	Devaluation***	CID	Q(0)****	Q(-40)
Jan-95	0.47	3.36	2.21	8.04	61.44	15.81
Feb-95	0.47	3.25	1.69	13.49	73.99	24.08
March-95	0.47	4.25	2.14	20.90	82.98	33.16
Avril-95	0.46	4.25	2.79	12.04	71.84	22.05
May-95	0.46	4.24	1.95	23.54	85.10	35.94
June-95	0.45	4.04	2.33	15.71	78.14	27.07
July-95	0.44	4.02	2.18	17.44	80.29	29.24
Aug-95	0.44	3.83	1.57	23.55	85.72	36.00
Sept-95	0.43	3.31	1.28	20.48	83.75	32.79
Oct-95	0.43	3.08	1.59	13.11	74.98	23.63
Nov-95	0.44	2.87	0.92	19.47	82.64	31.64
Dec-95	0.42	2.77	0.54	23.72	86.37	36.21
Jan-96	0.41	2.57	0.67	19.23	83.26	31.43
Feb-96	0.39	2.34	0.78	14.68	78.69	25.87
March-96	0.40	2.22	0.73	13.64	76.67	24.43
Avril-96	0.40	2.03	0.52	13.91	77.41	24.81
May-96	0.41	2.00	0.57	12.81	75.45	23.26
June-96	0.41	1.94	0.64	11.06	71.96	20.69
July-96	0.42	1.91	0.62	10.76	71.11	20.23
Aug-96	0.41	1.95	0.89	7.93	64.19	15.73
Sept-96	0.41	1.88	0.76	8.64	66.14	16.90
Oct-96	0.41	1.86	0.58	10.90	72.02	20.48
Nov-96	0.41	1.79	0.65	9.02	67.42	17.52
Dec-96	0.40	1.79	0.70	8.40	66.22	16.54

*	T bills interest rates - monthly rates.
**	Overnight monthly interest rate.
***	Expected Rate. measured in the first date of the month.
****	$Q(r)$ is the implicit probability of persistency of the bad state given a low rate of return r.
Source:	Banco Central do Brasil. Bolsa de Mercadorias & Futuros and FED (St. Louis).

Table 4.A2. **Foreign Investments: Net Inflow of Resources,**
January 1992-December 1996 ($ million)

	Portfolio Invetments	Direct Investments	Funds Fixed and Privatisation
Jan-92	266	309	-
Feb-92	162	229	-
March-92	326	234	-
Avril-92	235	90	-
May-92	245	57	-
June-92	134	53	-
July-92	203	27	-
August-92	-80	34	-
Sept-92	36	-26	-
Oct-92	241	73	-
Nov-92	167	21	-
Dec-92	-232	55	-
Jan-93	237	101	-
Feb-93	262	27	-
March-92	137	23	-
Avril-93	252	59	-
May93	394	20	-
June-93	192	11	-
July-93	702	-49	-
Aug-93	1 168	18	-
Sept-93	-439	14	-
Oct-93	1 373	48	-
Nov-93	899	112	-
Dec-93	1 417	13	80
Jan-94	1 191	313	82
Feb-94	1 124	119	78
March-94	269	176	106
Avril-94	396	229	256
May-94	887	138	300
June-94	535	235	586
July-94	185	189	-70
August-94	122	16	46
Sept-94	-123	134	208
Oct-94	15	67	1 072
Nov-94	436	148	10
Dec-94	42	148	-343

Table 4.A2. (continuation and end)

	Portfolio Investments	Direct Investments	Funds Fixed and Privatisation
Jan-95	-924	424	-334
Feb-95	-34	90	-46
March-9	-1 094	119	-1 185
Avril-95	161	106	59
May-95	1 138	226	56
June-95	-18	265	-37
July-95	1 339	142	194
Aug-95	2 255	227	478
Sept-95	539	362	-86
Oct-95	982	141	120
Nov-95	170	336	189
Dec-95	239	532	111
Jan-96	1 084	455	329
Feb-96	607	235	74
March-96	-43	479	-19
Avril-96	574	478	1
May-96	723	1623	-73
June-96	-218	1103	-2
July-96	-68	585	9
Aug-96	727	429	-40
Sept-96	631	348	1
Oct-96	701	824	14
Nov-96	718	899	-106
Dec-96	682	1 737	-18

Source: BACEN.

Table A3. **Quality of Foreign Investment and the Probability of Bad Scenarios: Some Regression Results**

Period	T-statistic	T-statistic	T-statistic	T-statistic	T-statistic	Adjusted R-squared	F-statistic
DITIE	0.155604	-0.009240				0.000087	0.479073
92.01 - 96.12	3.934418	-0.071116				-0.017153	0.005057
DITIE	0.149340	-0.023293		0.698182		0.535899	2.116281
92.01 - 96.12	3.777619	-0.279169		8.011298		0.519324	32.331700
DITIE	0.149477	-0.038047		0.748983	-0.165037	0.543903	1.906550
92.01 - 96.12	3.711107	-0.439115		7.893010	-0.968802	0.519025	21.862760
DITIE	0.139519			0.750051	-0.154007	0.542334	1.903434
92.01 - 96.12	4.170893			7.867496	-0.912925	0.525989	33.180010
Ln(DITIE)	-2.438914		-0.237032			0.011443	0.747461
92.01 - 96.12	-6.178615		-0.805135			-0.006210	0.648242
Ln(DITIE)	-2.360222		-0.117522	0.605973		0.372820	2.289201
92.01 - 96.12	-5.887221		-0.457544	5.488192		0.348697	15.455380
DITIN	0.525025	-0.212252				0.000376	2.210357
93.01 - 96.12	1.104208	-0.131492				-0.021355	0.017290
DITIN	0.379111	-0.096089		0.312811	-0.370010	0.003866	1.974903
92.01 - 96.12	0.891375	-0.067011		0.170317	-0.205803	-0.050468	0.071153
DITIN	0.861369	-0.913229		0.826133	-1.090851	0.220222	2.180185
93.01 - 96.12	3.560327	-0.755792		8.524485	-8.442434	0.167055	0.011377
Ln(DITIN)	-2.386313		-0.724931			0.038737	1.099845
93.01 - 96.12	-3.032841		-1.269613			0.014705	1.611917
Ln(DITIN)	-2.341565		-0.717650	0.190724		0.091989	2.150555
93.01 - 96.12	-3.196901		-1.351394	1.126474		0.038577	1.722242

* DITIE =   Foreign Direct Investment (entry) / Total Foreign Investment (entry).

DITIN =   Foreign Direct Investment (net entry) / Total Foreign Investment (net entry).

Source: Banco Central do Brasil. Bolsa de Mercadorias & Futuros. FED (St. Louis) and ANBID.

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V

Capital Inflows and Investment Performance: Chile in the 1990s

Manuel R. Agosin

Abstract

This chapter deals with the relationship between capital inflow and investment during the most recent surge of foreign capital into Chile. Capital inflows have been large since the late 1980s, but only marginally larger (in relation to GDP) than in the 1960s and considerably smaller than during 1977–81. Yet their composition has changed markedly, with foreign direct investment (FDI) now the main component, as against bank lending during the late 1970s and early 1980s, and public flows in the 1960s.

To tackle the complex policy problems posed by capital inflows, the authorities have deployed a package of policy instruments, including disincentives to short–term flows, sterilised intervention on foreign exchange markets, and the more vigorous use of managed exchange–rate flexibility. They have discouraged the more volatile forms of capital inflow, appreciated the real exchange rate in a managed way, and kept the current account deficit low.

The author analyses the effects of capital inflow on investment within a framework which emphasises differential impacts on tradables and non–tradables. Empirically, he finds a positive relationship between capital inflows and investment for 1960–94 as a whole, perhaps because the availability of foreign exchange has constrained the Chilean economy during most of this period. FDI has more favourable effects on investment than other kinds of inflows, which behave as a transitory variable.

Since the abundance of foreign capital in the 1990s has lifted the foreign exchange constraint, the impact of capital inflows on investment has depended crucially on the behaviour of the exchange rate. The controlled appreciation of recent years has favoured investment: it has reduced the relative prices of investment goods while not unduly discouraging investment in tradables, which would have led to a shorter investment cycle than the economy has had during the current decade. Other conditions favourable to investment have also been present: output close to full capacity and interest rates at reasonable levels.

Introduction

Together with other Latin American countries, Chile has received large capital inflows since the late 1980s. Stimulated by a debt–equity swap programme with a large, implicit exchange rate subsidy for foreign direct investment (FDI) in specified projects, such flows resumed earlier in Chile than in other countries in the region. Chile differed from other Latin American countries in that it had already undertaken deep pro–market reforms well ahead of others. By the time the new inflows began, the reforms — trade liberalisation, privatisation of many firms, deregulation of financial markets, the freeing of controls on capital inflow (and outflow), and labour market reforms — had been in place for about a decade[1]. The success of trade liberalisation hinges to a large extent on whether a depreciation of the real exchange rate accompanies it, which can be jeopardised if the liberalisation of the capital account permits a massive inflow of foreign capital. This can explain the difficulties faced by countries such as Peru, Argentina and Brazil, which have only recently tackled trade liberalisation. In the 1990s, the Chilean authorities did not have to contend with the complex problems of undertaking reforms *and* dealing with the effects of capital inflow at the same time.

Lessons from the late 1970s and early 1980s strongly influenced policy towards capital inflow. At that time, the use of a nominal exchange rate anchor to bring down inflation quickly, together with the unrestricted liberalisation of the capital account, had led to a boom–bust cycle. Large inflows (mostly in the form of loans from international private banks) and a huge exchange–rate appreciation during 1977–81 were followed by a drying up of private capital inflows beginning in 1982 and an even larger depreciation. During that episode, capital inflows, instead of increasing investment, led to a significant drop in saving and a sharp rise in consumption, imports, and construction of luxury housing. The authorities wanted to prevent a repetition of those events, protect export–oriented growth and maintain the investment rate on its upward course. For the sake of not inducing undue exchange–rate appreciation, they adopted a gradual approach, to slow inflation and discourage the more volatile forms of capital inflow.

Capital inflows have turned out to be a mixed blessing, mainly because the exogenous increase in supply to all Latin American countries has been very large and, in many cases, has exceeded the capacity of recipients to absorb it as investments in the tradable sectors of the economy. While capital inflows have relieved the foreign exchange constraint, and this has favoured investment, their massive size has posed difficult dilemmas for policy makers. To ensure that foreign capital contributes to larger investment and growth and not to an unsustainable increase in consumption has not been easy. This issue has much to do with the macroeconomic impacts of capital inflow, which in turn have been decisively affected by the policy response to them.

Without intervention on foreign exchange markets and in the absence of active policies toward the capital account, massive capital inflows will appreciate the real exchange rate beyond net increases in productivity, which may be undesirable from the point of view of other important policy objectives (e.g. encouraging export growth and diversification, attaining higher investment rates, or meeting targets for the

current–account deficit consistent with sustainable capital inflows). On the other hand, intervention in the foreign exchange market tends to swell the domestic money supply and increases the difficulties of controlling inflation.

Sterilised intervention is not without its problems. The Central Bank winds up accumulating large foreign exchange reserves with returns below those on Central Bank debt (which must be issued in the domestic market to conduct the required sterilisation operations). Moreover, sterilised intervention tends to keep domestic interest rates high, encouraging further capital inflow.

An important share of the recent inflow to Latin American countries has taken the form of capital with short–term horizons. Two components clearly of a short–term nature have been quite prominent in the first half of the 1990s: portfolio flows and short–term lending or deposits. Portfolio flows are not usually thought of as short–term capital, but in practice they are. Typically, portfolio investors operate with imperfect information, seek short–term capital appreciation, and are prone to bandwagon effects, either in taking positions or in liquidating them. Short–term bank credits can also be very volatile, as they respond to differentials in interest rates adjusted for exchange rate expectations and country–risk premia. Formally, for interest–arbitraging capital inflows to occur, the following condition — which lies behind the analysis here of recent changes in the incentives to capital movements — must hold:

$$(1+i) > (1+i^*) * [1+E(\hat{e})] * (1+c)$$

where i = the domestic nominal interest rate; i^* = the foreign interest rate; $E(\hat{e})$ = the expected rate of depreciation of domestic currency; and c = the country risk premium. For capital inflows to take place, the domestic interest rate must exceed the international rate by a margin more than sufficient to compensate for the expected depreciation of the recipient country's exchange rate and the country risk premium.

These conditions have prevailed in Chile since the late 1980s. On the one hand, domestic interest rates have remained high, owing to high inflation and restrictive monetary policies. On the other, dollar interest rates in 1992 and 1993 reached a thirty–year low, and while they have risen since then they remain much lower than in the 1980s. The other two terms in the interest arbitrage condition have also favoured capital inflows. As Chile began to emerge from the debt crisis, expectations regarding the real exchange rate turned from real depreciation to appreciation. Improving terms of trade also contributed to the change in expectations. Moreover, expectations of exchange–rate appreciation, owing to the capital inflow itself and to an improved current account position, made short–term roundtripping appear very profitable. Also, the country risk premium declined as in other countries in the region. One can interpret the "emerging markets" mania of recent years in international stock markets as a dramatic reduction in perceived country risk. Chile's relatively developed domestic stock market, plus the burgeoning use of American Depositary Receipts (ADRs) for placing shares in the US stock markets, made Chilean stocks a prime candidate for investors seeking new and more exotic financial vehicles.

Up to the mid–1970s, Chile had a tradition of capital controls. Since then, policy makers have maintained a fairly open capital account, and recent policies represent a move toward greater pragmatism rather than a reversal. In a nutshell, the policy response during the current surge in the supply of foreign capital attempted to discourage short–term capital inflows while maintaining liberal policies towards long–term inflows. The authorities have also resorted to sterilised intervention to slow down real exchange rate appreciation and thus protect a development strategy based mainly on export growth and diversification.

This chapter studies the impact of capital inflow on Chilean investment and growth performance. It posits that the effects have been in the main quite positive, and that the benefits come chiefly from the policy stance of the authorities, who have taken steps to protect the economy from the swings in short–term and essentially reversible flows, while maintaining liberal access conditions for longer–term capital inflows.

The first section describes the nature of recent capital inflow and places it in the perspective of long–run trends. It concludes that, when expressed in 1986 dollars and as a percentage of GDP, recent capital inflow has been somewhat higher than the levels prevailing in the 1960s, about the same size as during the debt crisis, and very substantially smaller than during the liberalisation of the capital account in the late 1970s. The composition of recent inflows is new, with a dominance of FDI and the practical disappearance of public flows and long–term lending by banks, the main components in the past.

We attribute much weight to the policy response, discussed in the second section, in determining the effects of the recent capital inflow. As already noted, the authorities discouraged speculative roundtripping and kept current–account deficits at very low levels, especially in relation to the supply of financing available. This impeded a much sharper appreciation of the real exchange rate than would have occurred without policy intervention, and helped prevent a Mexican–style crisis.

The third section begins by discussing the long–term investment performance of the Chilean economy. Despite a remarkable increase in investment rates since the trough of the debt crisis in the mid–1980s, they have exceeded their 1960s levels only since 1992. Capital inflow has certainly been a positive factor in making possible the increase in investment that took place over the 1990s. A theoretical model shows that, formally, the impact of capital inflow on investment is larger when foreign exchange is scarce than when it is abundant; in the latter case, the net impact on aggregate investment will depend on the exchange–rate effects of the inflow. With "excessive" capital inflow, an appreciating real exchange rate can lead to a decline in investment in tradables larger than the increase in investment in non–tradables.

The econometric estimation of the equilibrium investment equation derived from the theoretical model shows for Chile a positive and highly significant long–term relationship between investment and capital inflow. It also shows that the positive association comes mostly from FDI rather than other flows. An error–correction model shows that FDI, more than other flows, has also supported the short–term adjustment

to disequilibrium in aggregate investment. During the recent episode of large capital inflow, the Chilean authorities' success in keeping at bay the forms of capital inflow only remotely related to productive investment while maintaining an open policy towards FDI, which translates on almost a one–to–one basis into higher real investment (and, to boot, has gone mostly into exportables), must have led importantly to the favourable outcome of recent years.

Recent Capital Inflow

Table 5.1 displays, as a percentage of current GDP, the detailed and (almost) consistent balance–of–payments data available since 1983. In the mid–1980s, and in spite of the debt crisis, capital inflows were relatively large as a proportion of GDP[2]. Substantial support from the multilateral financial institutions partly compensated the disappearance of voluntary bank lending and public flows became the main form of international financial resources available to the Chilean economy during the 1980s.

The story of the return of capital inflow has been told before (see Agosin, 1995; Agosin *et al.*, 1994; Ffrench–Davis *et al.*, 1995; Agosin and Ffrench–Davis, 1997); a brief summary will suffice here. Private financial flows began to return to Chile in 1986, well ahead of the foreign capital surge to Latin America as a whole. The initial spurt came almost exclusively through the debt–equity swap programme instituted by the authorities in the second half of 1985. Other private flows did not become significant until 1989. In part owing to the large exchange rate subsidy implicit in the swap scheme, the programme succeeded in attracting significant amounts of FDI in the form of swaps (Ffrench–Davis, 1990), but FDI not associated with swaps continued to grow apace. Foreign investors stopped using the swap programme in 1991, mainly because the international price of Chilean debt had risen to an extent that made it no longer profitable to invest *via* debt swaps. Thus, FDI represents a large part of the capital inflow that has gone to Chile over the last decade or so. About 60 per cent of FDI through regular channels has gone into copper mining, the remainder concentrating in services. The bulk of investments made with debt–equity swaps went into the processing of natural resources, especially forestry and pulp and paper, and into services (see Riveros *et al.*, 1996).

Short–term private credits became a big item in the capital account in 1990, as Chilean interest rates remained high, dollar rates were on a downward course, international investors began to expect that the peso would appreciate and the country risk premium declined significantly. These flows were very important until 1993, when they began to fall off as a consequence of the measures adopted to stem them (see below). They have practically disappeared in net terms.

Portfolio inflows, new to the Chilean economy, also began in 1989. They have taken two forms: investments through mutual funds organised in the major international capital markets and the issuance of ADRs by a handful of large Chilean corporations. The ADR is a mechanism by which foreign corporations can issue new shares on the US stock markets. These flows were quite large from 1990 through 1994. Later, the combined effect of the Mexican crisis and tighter regulations on these inflows (see next section) caused them to decline sharply.

Table 5.1. **Chile: Net Capital Inflows, 1983-95**

(as a % of GDP at current prices)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Total net inflows	2.9	11.1	8.0	5.4	4.1	3.7	4.1	9.6	3.4	6.4	6.6	7.5	-1.4
FDI	0.8	0.4	0.8	2.2	5.5	5.9	6.5	5.7	2.6	1.1	2.7	3.9	3.7
Regular inflows[a]	0.9	0.4	0.6	1.1	2.1	2.3	2.6	4.6	3.1	2.1	3.7	5.9	5.1
Debt swaps	0.0	0.0	0.2	1.1	3.4	3.7	3.9	1.1	-0.1	-0.1	-0.1	-0.2	-0.3
Outflows	-	-0.1	-	-	-	-0.1	-	-	-0.4	-0.9	-0.9	-1.8	-1.0
Net portfolio inflows	-	-	-	-	-	-	0.3	1.2	0.7	1.1	2.3	2.0	-
Medium and long-term private credits	2.8	-1.9	-2.2	-4.4	-5.3	-4.6	0.2	0.4	-	0.5	0.5	1.0	0.5
Short-term private credits[b]	-2.4	3.3	1.0	2.7	-1.1	-1.0	1.1	2.9	2.1	3.5	1.9	0.9	-
Public inflows	1.6	9.3	8.4	4.9	5.1	3.3	-4.0	-0.7	-2.0	0.3	-0.9	-0.3	-5.7

a.   Includes credits associated with FDI.
b.   Includes errors and omissions.
Source: Author calculations, based on data of the Central Bank of Chile.

The original or "primary" issue of ADRs represents an opportunity for expanding the capital of firms at relatively low cost, since capital costs in international markets tend to be lower than in Chile. There also exists what is known as the "secondary" issue of ADRs through purchase of the underlying stock in the Chilean market by foreigners and its subsequent conversion into ADRs (for a thorough discussion, see Ffrench–Davis, Agosin, and Uthoff, 1995). This operation does not constitute an enlargement of the capital of the issuing company but only a change in ownership from nationals to foreigners. While there is nothing intrinsically negative about these operations, it may be necessary to discourage them when foreign exchange is overabundant and there are significant downward pressures on the exchange rate[3]. These shifts in ownership also expose the economy to an additional degree of uncertainty and volatility, because when foreign investors' mood changes they can easily reverse the operation and convert their ADRs into the underlying stock in national currency for sale on the domestic stock market[4].

As private flows have increased, public flows have fallen, indeed becoming net outflows. During 1989–91, these net outflows arose mainly through the counterpart public debt operations involved in FDI through debt–equity swaps. More recently, they mostly represent debt repayments, which were particularly large in 1995 when they more than compensated large net inflows of private foreign capital.

Since 1991, several large Chilean corporations have made direct investments abroad. These now significant flows, destined mainly for neighbouring countries, account for almost two per cent of GDP. The largest investments have been in electricity generation and distribution (mostly in the privatised companies of Argentina), but other sectors such as light manufacturing and retailing are also represented.

Table 5.2 and Figure 5.1 place recent capital inflow in historical perspective; they show total capital inflows in 1960–95 as a proportion of GDP, in both current and 1986 prices[5]. The transformation of the data to a constant–dollar basis corrects the distorted meaning of the ratio in current dollars due to very wide fluctuations in the real exchange rate. Table 5.2 uses a periodisation maintained below in the analysis of investment data. It takes the period before 1971 to reflect a sort of long–run steady state for the Chilean economy, before the wide policy swings that followed. The 1971–73 period corresponds to the socialist experiment. That from 1974 to 1981 represents the first complete business cycle of the military government, during which the authorities introduced most of the free–market reforms in Chile. It begins with the deep recession of 1974–75 and ends with the peak of the boom of the late 1970s and early 1980s. The 1982–89 period coincides with the debt crisis and also a somewhat greater pragmatism in economic policy. Depressed economic conditions marked the first three years, followed by quick recovery in 1985–89. This last year also represents a cyclical peak. Finally, the period since 1990 corresponds to the return to democratic rule and is roughly coincident with the latest episode of foreign capital abundance. During this entire period, the economy has expanded briskly, at close to capacity output[6].

Table 5.2. **Capital Inflow**
(as a percentage of GDP)

	Current prices	1986 prices
1960-70	2.6	4.3
1971-73	1.2	2.1
1974-81	9.0	12.4
1982-89	5.3	6.3
1990-95	4.7	5.2

Source: Central Bank of Chile.

Figure 5.1. **Capital Inflow, 1960-95**
(percentage of GDP)
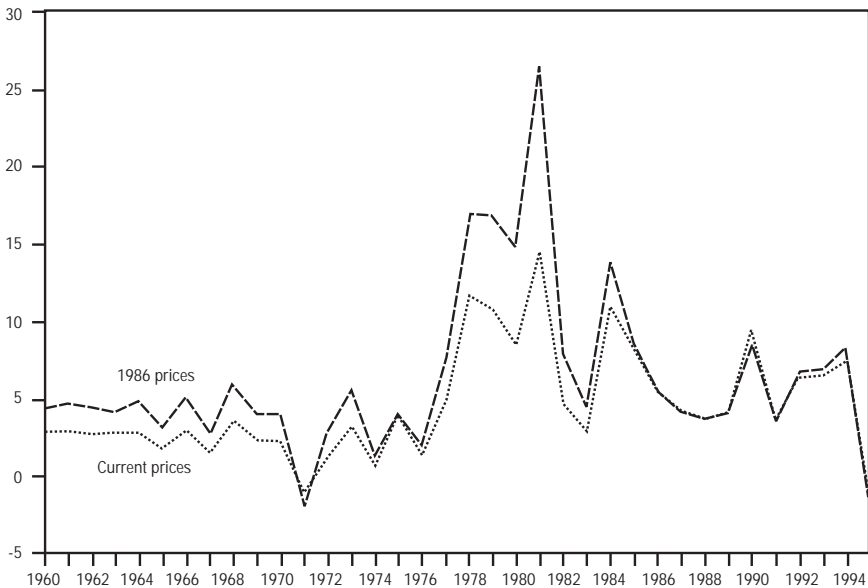
Source: Author calculations, based on Bank of Chile data.

The ratio of capital inflow to GDP behaves essentially the same whether measured in current or constant prices, although the latter series shows considerably larger volatility. By historical standards, capital inflows have been far from excessive in the most recent period. In fact, the ratio of capital inflow to GDP was only slightly larger in 1989–1995 than in the 1960s and, surprisingly, somewhat smaller than during the 1980s[7]. This absence of a large surge in total inflows (at least as a proportion of GDP) could have resulted from policies (dealt with in more detail below) that discouraged certain types of inflows, so that significantly smaller amounts of foreign capital have entered the economy than those on offer. The real outliers are the years of complete liberalisation of the capital account (1977–81), when the ratio of inflows to GDP at constant prices topped 20 per cent. A definite difference shows up in the much greater volatility of inflows since the liberalisation of the capital account in the mid-1970s.

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The Policy Response

In the 1990s the Chilean authorities have adopted a battery of policies towards the surge in capital inflows. On the one hand, the Central Bank has attempted to discourage short–term and speculative inflows while maintaining open access for FDI. On the other, it has sought to insulate the domestic economy partially from the impacts of inflows by intervening in foreign exchange markets to prevent an excess supply from unduly appreciating the real exchange rate, and by sterilising almost completely the monetary effects of the rapid accumulation of international reserves (see Ffrench–Davis *et al.*, 1995; Agosin and Ffrench–Davis, 1997).

The authorities' main goal for exchange rate policy has been to protect their growth model based on the expansion and diversification of exports. For exports to continue as the engine of growth, the level and stability of the real exchange rate are crucial. This objective could have been placed in jeopardy if capital inflows had caused excessive exchange rate appreciation and greater future volatility when the direction of net flows went into reverse. On the other hand, sterilised intervention was deemed necessary in order not to fall short of the inflation targets of the Central Bank.

The Chilean authorities have attempted to regulate the foreign exchange market to prevent large misalignments in the real exchange rate relative to its long–term trend. They chose the option of making the long–term fundamentals prevail over short–term or medium–term disturbances. In the face of uncertainty, rather than a unique price, they have used an exchange rate band centred on a reference price; it is linked to a basket of three currencies, with the dollar, the deutsche mark and the yen represented with fixed weights based on their share in Chilean trade[8].

Exchange rate policy has experienced substantial change over time. From the onset of the debt crisis until 1989, the exchange rate regime was a strict crawling peg with a narrow band. When the abundance of foreign exchange began to develop in 1990, greater flexibility was introduced, with discreet revaluations, a gradual widening of the floating band to ten percent around a central parity, and dirty floating within the band. In addition, the dollar peg was abandoned in favour of a peg to a basket of currencies. Thus exchange rate policy evolved from a system that gave interest rate arbitrageurs a high degree of certainty as to where the price of the dollar would be in the near future to a system in which they can incur substantial exchange–rate losses from arbitraging the peso and the dollar.

Other policies to discourage unwanted short–term capital have also been used. They consist of direct disincentives to interest rate arbitrage (and, more recently, to arbitrage in Chilean stocks traded on US markets) in the form of non–interest bearing reserve requirements. In June 1991, a reserve requirement of 20 per cent was established on external credits. The reserves had to be maintained with the Central Bank for a minimum of 90 days and a maximum of one year, which meant that their impact fell mostly on short–term flows. At the same time, a stamp tax on domestic credit, at an annual rate of 1.2 per cent on operations of up to one year, was extended to external loans. In May 1992, reserve requirements on external credits went up to 30 per cent

and were subsequently extended to time deposits in foreign currency; in October, the period during which the deposit had to be maintained was raised to one year regardless of the maturity of the loan. As downward pressures on the exchange rate continued, the Central Bank, in July 1995, extended the reserve requirement obligation of 30 per cent to all foreign financial investments in the country (including purchases of Chilean stocks by foreigners, or so–called secondary ADRs).

Some observers have claimed that the efficacy of measures to discourage capital inflows is only temporary, as private sector operators find ways to evade them (Valdés–Prieto and Soto, 1996). While some circumvention is inevitable, no hard evidence shows massive evasion of the measures to discourage short–term capital inflows. In fact, as Table 5.1 showed, short–term flows (as a share of GDP) have tended to decrease significantly. In the absence of the policy measures taken, they might have been considerably larger. Econometric evidence suggests that the measures have worked rather well; the combination of disincentives to short–term inflows with the reforms in the exchange rate regime reduced significantly the inflow of short–term, interest–arbitrage funds (Agosin, 1995).

Another recent paper estimates that unremunerated reserve requirements have imposed a significant extra cost on interest arbitrage. In 1994, for example, while LIBOR was 5.6 per cent on average, the reserve requirement scheme raised the cost of borrowing on international capital markets by an extra 4.1 per cent on annual loans, 6.7 per cent on six–month loans and 12.2 per cent on three–month loans (Agosin and Ffrench–Davis, 1997, Table 3). These calculations suggest that the policy must have discouraged short–term borrowing while having relatively small effects on longer–term borrowing. The marginal implicit tax on borrowing at maturities longer than one year is effectively zero. Therefore, the annual equivalent of the implicit tax declines rapidly with maturities[9].

Although introduced after large inflows of capital to the stock exchange had already taken place, the imposition of reserve requirements on portfolio flows was also timely. In 1994 alone, gross inflows of portfolio capital represented about 3.5 per cent of GDP. Thus the extension of reserve requirements to these inflows can be considered as an attempt to deal with an incipient problem already causing difficulties in policy management, which could have become even more important in the future. Although significant in comparison with Mexico, the internationalisation of the Chilean stock exchange was just beginning.

Is it possible, or desirable, to distinguish between "permanent" capital inflows such as FDI or long–term lending and short–term or "temporary" flows, likely to be more volatile and more disruptive? Claessens *et al.* (1995) claim that balance–of–payments categories have little to do with the stability of flows themselves, with long–term flows just as likely to be unstable as short–term ones[10].

In order to test their hypothesis for Chile, a series of tests were run to determine the degree of persistence of different types of private flows. First, after determining the optimal lag for each type of flow[11], they involved an autoregressive analysis of quarterly data on FDI, portfolio capital, long–term private borrowing and short–term

private borrowing for 1983–95. Table 5.3 shows the results; it reveals that, indeed, FDI and long–term borrowing have the most persistence, judging by the significance of their own lags. For FDI, the second and third quarterly lags are very significant predictors of contemporaneous levels; for long–term private borrowing, the first and third lags do the same. On the other hand, for portfolio flows and for short–term private borrowing, there just is no persistence at all. Second, the tests calculated the coefficient of variation and the R^2s of the time trends of the same four categories of flows (also shown in Table 5.3). The coefficients of variation indicate the variability of flows around their mean; and $1 – R^2$ indicate their variability around their time trend. On both counts, FDI is more stable than short–term borrowing and portfolio flows.

Table 5.3. **Persistence Analysis for Components of Private Flows**
(Quarterly data, 1983-95)

Lags (No. of quarters)	FDI	Portfolio	Private borrowing	
			Long-term	Short-term
Autoregressive equations				
1	0.201 (1.34)	0.156 (0.74)	0.643 (4.57)**	-0.158 (-1.09)
2	0.495 (3.61)**	0.055 (0.26)	-0.226 (-1.36)	-0.064 (-0.42)
3	0.491 (3.56)**	0.153 (0.72)	0.339 (2.63)**	0.241 (1.65)
4	-0.244 (-1.53)			
Constant	47.255 (1.344)	77.695 (1.57)	-10.200 (-0.539)	118.24 (2.11)*
R^2	0.908	0.460	0.500	0.192
Other indicators				
Coefficient of variation (%)	84.2	118.5	-568.4	338.4
R^2 of time trend	0.840	0.438	0.148	0.114

Effects on Investment

Long–term Investment and Growth Trends

In comparing pre– and post–1985 investment rates keep in mind that the national accounts were revised substantially in 1992 (recalculations being backdated to 1985 with revised data, and to 1974 with the new methodology but old data). Among other things, the redefinitions included reclassifying certain goods from intermediate inputs to investment goods. The result raised the estimated investment rate substantially. To make pre– and post–1985 comparisons here, the investment and GDP data were spliced by raising the pre–1985 series by the 1985 percentage increase involved in the redefinition.

According to the new series, the rate of gross fixed investment to GDP has risen steadily from its trough in the early 1980s (Table 5.4 and Figure 5.2), from about 15 per cent of GDP in 1983–84 to over 27 per cent in 1995. Even taking averages for 1982–89 and 1990–95, the investment rate rose sharply, from less than 19 per cent to 25 per cent of GDP. The national saving rate increased even more spectacularly, going from 13 per cent in the 1980s to 27 per cent in the 1990s. At the same time, foreign saving declined sharply, from 6.5 per cent of GDP to 1.5 per cent. This is indeed surprising since, as discussed above, foreign capital inflow averaged about five per cent of GDP in the 1990s. It suggests that the policies of sterilising capital inflow and fiscal austerity, by preventing undue real exchange rate appreciation, made the economy absorb less foreign capital than that on offer. The counterpart of the difference between capital inflow and foreign saving (i.e. the current account deficit) was, of course, the accumulation of foreign assets by the Central Bank.

Table 5.4. **Chile: Investment. Saving and Growth Indicators, 1960-95**

(as a percentage of GDP in 1986 prices)

	Gross fixed investment	Gross investment	Machinery & equipment	Public investment[a]	Private investment[b]	National saving	Foreign saving	Per capita GDP growth
1960-70	23.2	25.1	11.1	6.8	16.5	21.9	3.2	2.2
1971-73	18.4	16.9	8.5	3.2	15.2	13.5	3.4	-1.1
1974-81	18.4	22.2	11.0	3.7	14.6	16.3	5.9	2.0
1982-89	18.7	19.8	8.9	2.7	16.0	13.4	6.4	1.1
1990-95	24.9	28.5	13.7	2.7	22.2	25.5	2.3	4.7

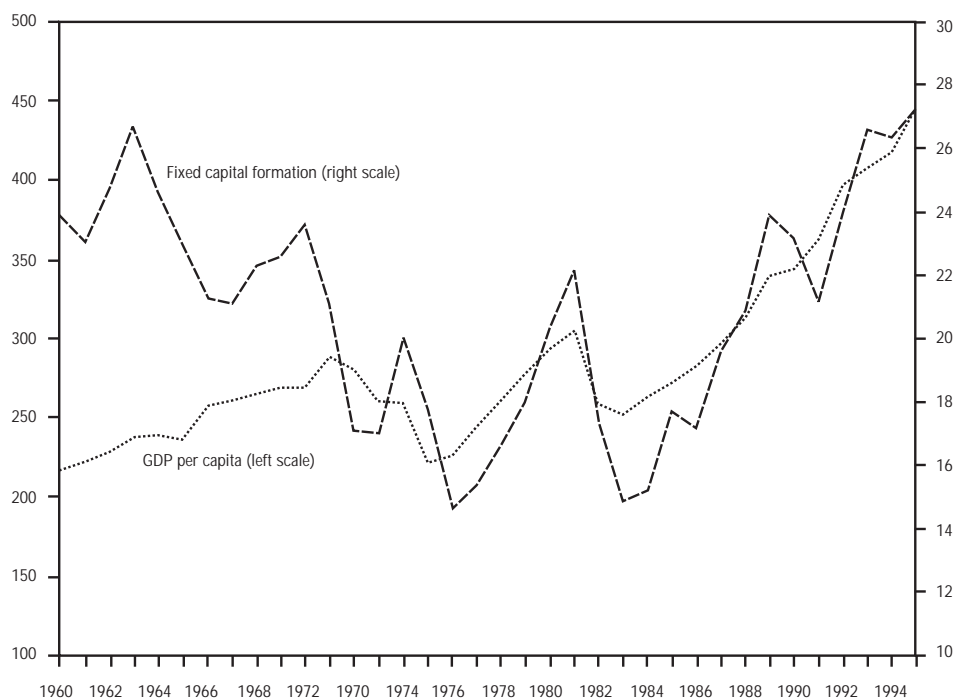a.   Central government investment expenditures.
b.   Gross fixed investment minus central government investment. Includes investment by public enterprises.

Source: Author's calculations. based on data of the Central Bank of Chile.

The long–term behaviour of saving and investment rates shows much less spectacular increases. During the 1990s, they barely exceed the averages achieved during the 1960s, and only since 1993 has the investment rate exceeded its 1963 peak. The real difference between the earlier and the later periods lies in the behaviour of private and public investment[12]. Public investment has clearly shown a downward long–term trend, compensated only in the 1990s by a vigorous increase in private investment. The main culprit for the fall in public investment has been the decline in investment in infrastructure, schools, hospitals and the like. This constitutes perhaps one of the weakest links in the so–called Chilean model: steady increases in international competitiveness (the basis of the growth strategy for over two decades) require *increases* in investment in social and economic infrastructure, not declines.

In the long–run data, the most recent period does not appear as an outlier, but rather those between 1971 and 1989 which exhibit strong declines in domestic saving and investment rates. The behaviour of the growth rate of per capita GDP is quite different, with a marked improvement in growth performance in the 1990s, compared not only to 1971–89 but also to the 1960s.

Figure 5.2. **GDP Per Capita** (thousands of 1986 pesos)
and Fixed Capital Formation (percentage of GDP, 1986 prices)

Fixed capital formation (right scale)

GDP per capita (left scale)

1960 1962 1964 1966 1968 1972 1970 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994

Modelling the Impact of Capital Inflow on Investment

Among the several efforts in recent years to model the behaviour of investment in Chile (Solimano, 1990; Lehmann, 1991; and Lehmann 1994), none deals explicitly with the impact of capital inflow on investment, although Solimano does consider the effects of exchange–rate changes on investment. The model developed below focuses on the effects of capital inflow, has explicit microeconomic foundations, and is estimated with co–integration techniques.

It begins by posing a microeconomic model of the investment decision. Despite the simplifying assumptions made to solve it, the model has the advantage of incorporating some key stylised facts of investment in developing country settings that are usually ignored in the literature on investment and crucial for analysing the effects of capital flows on investment. The objective is to derive a strong theoretical foundation for the empirical modelling of investment in the Chilean economy and the response of investment during periods when the economy is constrained by foreign exchange availability and when it is not, as has been the case since 1989.

What stylised facts need to be accounted for? *First*, Chile imports an overwhelming proportion of the capital goods used in the economy, which directly links capital inflow and investment. *Second*, investment is constrained during most periods by the availability of foreign exchange and almost always by the availability of credit from domestic capital markets. Foreign capital inflows relieve both of these constraints and allow firms to move closer to their desired (i.e. unconstrained) levels of investment. At the same time, capital inflows have an indirect positive effect on investment by lowering the real exchange rate and the price of imported capital goods, thereby making investment more profitable and, in addition, "stretching" scarce domestic credit resources. *Third*, by appreciating the exchange rate, capital inflows raise the relative profitability of non–tradables and lower that of tradables. Thus, the impact of increases in capital inflows on investment *via* the exchange rate is positive in non–tradables and negative in tradables. The model incorporates these differential effects into its structure. *Fourth*, the efficiency of investment in developing countries depends crucially on the availability of certain non–traded inputs (particularly, infrastructure), requiring a public capital externality in the production functions of both sectors.

The model abstracts from some key features of investment, emphasised in some recent literature. These include the irreversible nature of the investment decision under conditions of uncertainty, or what has been labelled the "option theory of investment" (Dixit and Pindick, 1994). These new models may have particular relevance in developing country settings, where important parameters affecting investment decisions can be very unstable. They may also apply to current circumstances in the other Latin American countries experiencing foreign capital surges, inasmuch as two components of these inflows (portfolio capital and short–term flows) are volatile and subject to reversal without warning, as witnessed in the Mexican crisis since December 1994 (Calvo and Mendoza, 1996; Sachs *et al.*, 1996). In fact, Chile's success in discouraging these flows (at least in comparison with other large recipients in the region) may have contributed to its more modest real exchange rate volatility and may partly explain its better investment performance. It would be too much to ask a theoretical model to deal with everything of interest, however. The option taken here develops a model that allows for the analysis of the effects of capital inflows on investment in a setting that mirrors the traits of the Chilean economy. Other likely effects, such as those on volatility of key prices affecting investment decisions, are discussed in a less formal manner.

In the model, investment is the only decision variable within a macroeconomic system constrained by the availability of domestic credit and foreign exchange. The model derives the equilibrium investment levels of firms producing tradables and those producing non–tradables, as well as the consequences for the equilibrium levels of relaxing the foreign exchange and credit constraints, an increase in the level of aggregate output, larger public investment and changes in the interest and exchange rates. It assumes two firms in the economy, one producing a non–tradable *(j=1)* and

the other a tradable $(j=2)$[13]. Without any loss of generality, capital is the only factor of production. In this economy there is a public investment externality on the production functions of each firm (because of the productivity of, say, infrastructure) and a single capital good is imported. Investment is conceived as purchases of a homogeneous capital good in physical terms. In order to keep the algebra simple, it is assumed that all investments last one period and that credit finances all investment. The context is one of a small economy which cannot influence international prices.

The two firms set investment in period t so as to maximise discounted net earnings from their projects:

$$\text{Max } \Pi_j = \frac{p_{j,t+1} * q_{j,t+1}}{(1 + i)} - e * p_k^* * I_{j,t}$$

$$for\ j = 1,2$$

where p_j = product price of the jth good, q_j = quantity produced, e = exchange rate (units of domestic currency per unit of foreign currency), p_k^* = international price of the capital good, i = interest rate, I_j = physical investment of the jth firm.

This objective function is subject to a number of constraints, one of which is technological, another relates to the nature of the markets in which firms operate, and two others reflect the credit and foreign exchange constraints. First, there is the precise specification of the production function, which in this economy is of the following type[14]:

$$q_{j,t+1} = I_{j,t}^\alpha * G_t^\beta$$

$$\alpha, \beta < 1 \tag{2}$$

where G = stock of public capital.

The firm in the non–tradable sector faces a downward–sloping demand curve, but the firm producing the tradable good faces international prices:

$$q_{1,t+1} = p_{1,t+1}^{-\varepsilon} * Y_{t+1}^\eta \qquad \varepsilon, \eta > 0$$

$$p_2 = e * p_2^* \tag{3}$$

Investment is constrained by the availability of domestic credit to each firm (C_j), variables defined in domestic currency. At the macroeconomic level, the availability of foreign exchange (F^*), a variable defined in units of foreign currency, constrains the aggregate investment of all firms:

$$I_{j,t} * e * p_k^* \leq C_{j,t} , \quad j = 1,2 \tag{4}$$

$$I_{1,t} * p_k^* + I_{2,t} * p_k^* \leq F_t^* \tag{5}$$

To derive the equilibrium levels of investment, set up two Lagrangians, one for each firm, take derivatives with respect to I_1 and I_2, respectively, and set them equal to zero. Replacing (2) and (3) in the resulting equations and collecting terms, one obtains the optimal levels of investment in the two sectors. Ignoring the time subscripts, they are:

$$I_1 = [A]^{\varepsilon/\rho} * Y^{-\eta/\rho} * G^{-\phi/\rho} \tag{6}$$

$$I_2 = \left[\frac{(1+i)*p_k^*}{p_2^*\alpha}\right]^{1/(\alpha-1)} * [B]^{1/(\alpha-1)} * G^{-\beta/(\alpha-1)} \tag{7}$$

where $[A] = \dfrac{p_k^*}{\alpha}[\varepsilon/(\varepsilon-1)](1+i)[e(1+\lambda_{11})+\lambda_2]$

$\rho = -\alpha + \varepsilon(\alpha-1)$

$\phi = \beta(\varepsilon-1)$

$[B] = 1 + \lambda_{12} + e^{-1} * \lambda_2$

and where λ_{11} and λ_{12} are the shadow prices of domestic credit for firm 1 and 2, respectively, and λ_2 is the shadow price of foreign exchange[15].

In order to study the effect of an increase in capital inflow on investment, differentiate equilibrium conditions (6) and (7) by F^* and obtain:

$$\frac{\partial I_1}{\partial F^*} = \frac{\varepsilon^2 * I_1 * p_k^* * (1+i)}{\alpha * \rho * [A] * (\varepsilon - 1)} * [(1+\lambda_{11})\frac{\partial e}{\partial F^*} + e\frac{\partial \lambda_{11}}{\partial F^*} + \frac{\partial \lambda_2}{\partial F^*}]$$

(8)

$$\frac{\partial I_2}{\partial F^*} = \frac{I_2}{(\alpha - 1)[B]} * [\frac{\partial \lambda_{12}}{\partial F^*} + e^{-1}\frac{\partial \lambda_2}{\partial F^*} - e^{-2}\frac{\partial e}{\partial F^*}]$$

(9)

From inspection of the signs of (8) and (9), it becomes clear that an increase in F^* unambiguously increases I_1 and has uncertain effects on I_2. The term associated with the first partial derivative in the right–hand side of (8) represents the impact of capital inflow on investment in non–tradables *via* the increase in their relative profitability resulting from exchange rate appreciation; the terms associated with the second and third partial derivatives reflect the effects of capital inflow on investment in the same sector that stem from relaxing the credit and foreign exchange constraints, respectively. In (8), $\rho < 0$, $\partial e/\partial F^* < 0$, and $\partial l_{11}/\partial F^*$, $\partial l_2/\partial F^* \leq 0$ [16]. In other words, capital inflows will cause the real exchange rate to appreciate and will either relax the domestic credit and foreign exchange constraints, in which case the shadow prices of domestic credit and foreign exchange will fall, or will have no effect on them if the constraints are not binding (in which case λ_{11}, λ_2, or both are equal to zero). In any of these cases, since *[A] > 0, (8)* will be positive. This stands to reason: even if foreign exchange or domestic credit are not binding constraints on investment, capital inflows do produce real exchange rate appreciation, which raises the relative price of non–tradables, encouraging investment in that sector. If foreign exchange or domestic credit are binding constraints on investment, the positive impact of capital inflow on investment in non–tradables is even stronger, since foreign capital not only improves the relative price of non–tradables but also enables firms to purchase additional investment goods with scarce foreign exchange and domestic credit.

On the other hand, the effect on tradables is ambiguous. Noting that *$\alpha - 1 < 0$ and [B] > 0*, the sign of (9) will depend on whether the sum of the first two effects of capital inflows (associated with relaxing the domestic credit and foreign exchange constraints, which can be expected to be positive) is larger than the negative effect of deteriorating relative profitability (associated with real exchange rate appreciation). If both the domestic credit and the foreign exchange constraints are not binding (if *λ_{12}, $\lambda_2 = 0$, and $\partial \lambda_{12}/\partial F^*$, $\partial \lambda_2/\partial F^* = 0$*), an increase in capital inflow will cause a fall in investment in tradables. If domestic credit and foreign exchange are scarce (*λ_{12}, $\lambda_2 > 0$, $\partial l_{12}/\partial F^*$, $\partial l_2/\partial F^* < 0$*), the effect of capital inflow on investment in tradables will depend on whether the positive effect of relieving the scarcities of foreign exchange and domestic credit is stronger than the negative effect of deteriorating relative profitability *via* real exchange rate appreciation. Formally, the condition for a positive effect of capital inflow on investment in tradables is:

$$/\frac{\partial \lambda_{12}}{\partial F^*} \ + \ e^{-1}\frac{\partial \lambda_2}{\partial F^*}/ \ > \ /e^{-2}\frac{\partial e}{\partial F^*}/$$

This analysis relates directly to the Chilean experience with capital inflow. Except for three relatively brief periods (1968–70, 1978–81 and the period since 1989), the Chilean economy has had a binding foreign exchange constraint. Therefore, capital inflows historically have had a positive effect on investment by relieving foreign exchange scarcity. Likewise, modern asymmetric information theories suggest that financial markets usually do not clear and that credit rationing is the norm (Stiglitz and Weiss, 1981). Besides, before the financial liberalisation of 1975, financial repression McKinnon–style was a stylised fact of the Chilean economy (McKinnon, 1991, Chapter 4). Thus increases in capital inflows can also be conceived of as having a positive effect on investment through their impact on relieving the domestic credit constraint. During periods of foreign exchange abundance, the positive effects of capital inflow on investment in tradables will be dampened. In extreme cases, aggregate investment can indeed decline: when neither the domestic credit nor the foreign exchange constraint is binding, investment in tradables will unambiguously decline; in some instances, the drop in investment in tradables could exceed the increase in investment in non–tradables. This explains why policy makers have attempted to discourage certain types of foreign capital and have, in addition, adopted policies not to absorb all the foreign capital on offer as increases in the current–account deficit.

Since 1990, the Chilean economy has experienced a bonanza of foreign capital, with the consequence that foreign exchange no longer constrains investment. Under these circumstances, the model tells us that the main impact of capital inflow on investment is ambiguous and could well be negative, depending on the values of the model's parameters. If the investment rate has continued to grow, it has done so because the growth of the economy, aggregate demand, and productivity have all been strong, and excessive exchange–rate appreciation has been prevented with the policies discussed above.

Equations (6) and (7) state that long–run equilibrium investment also depends on real income *(Y),* credit *(C),* public capital *(G),* the exchange rate *(e),* and the interest rate *(i).* The signs of the effects are derived formally in the appendix. Here the discussion is qualitative. Increases in real income raise investment in non–tradables and have no effect on investment in tradables[17]. Increases in public investment and in the availability of domestic credit should have positive effects on investment in both sectors. It is not clear whether interest rate changes have any impact on equilibrium investment, since in the model investment is constrained by the availability of credit. If the credit constraint is not binding, an increase in interest rates will cause investment to decline in both sectors. On the other hand, there are good reasons to assume that the credit constraint most often is binding, even in the absence of financial repression. Therefore, on an *a priori* basis, it is uncertain whether the interest rate will enter with a significant coefficient when it is included in the investment equation together with the availability of credit[18]. In Chile, with financial liberalisation in 1975, real interest rates went from

very negative to positive and then very high before settling down to more reasonable levels in the early 1980s (see Figure 5.3). It is possible that very high real rates do discourage real investment; and that negative real rates, by requiring pervasive credit rationing, also lead to low real investment rates.

Figure 5.3. **Real Exchange Rate and Real Interest Rate**
(1986 = 100 and percentage)
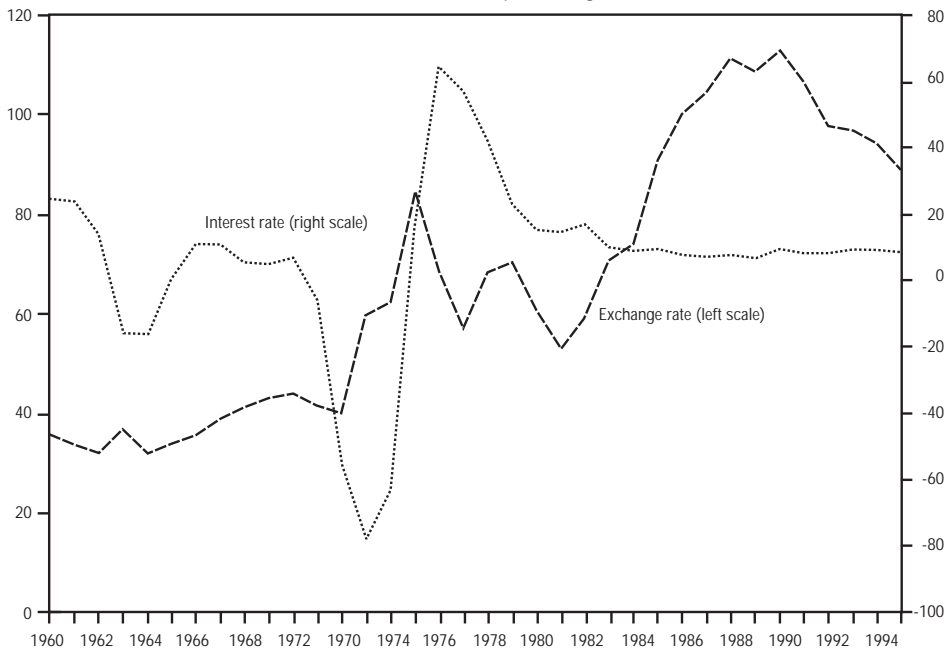
Source: Author calculations, based on Central Bank of Chile data.

Finally, the sign of the effect of exchange–rate changes on investment is not obvious from the theoretical model. On the one hand, appreciation lowers the relative price of investment goods. On the other, it changes the relative profitability of tradables and non–tradables in favour of the latter. Coming down from the lofty realm of the model, it is not difficult to speculate why the sectoral distribution of investment can have significant consequences for long–run growth. Investment in exportables generally does not run into problems of absorption, in the sense that foreign markets for non–traditional products exported by Chile are in effect unlimited as far as Chilean firms are concerned. In other words, Chilean firms face an infinitely elastic demand curve for such products, and investment booms can proceed without concern for the size of the market[19]. This obviously is not the case with non–tradables. Investment booms in this sector are short–lived, the most evident example being residential construction. Excess capacity and low profits (or even losses) develop quickly. Long–term growth will likely be much stronger if incentives are not prematurely and unduly skewed towards non–tradables.

Thus the linkage between the exchange rate and the pattern of investment could turn out to be crucial for evaluating the impact of capital inflows on long–term growth and investment. Chile's experience with the unrestricted liberalisation of foreign capital inflows and sharp real exchange rate appreciation during 1978–81 provides a graphic example of the boom–bust pattern of growth induced by such policies.

Sharp exchange rate appreciations induced by booms in reversible capital inflows (as was the case in 1977–81) tend to be short–lived and followed by equally strong movements of the exchange rate in the opposite direction. This was certainly the case during 1982–86, when private capital inflows dried up and the exchange rate depreciated strongly in real terms (see Figure 5.3). Therefore, steep appreciations are also associated with greater *volatility* of the exchange rate. This volatility likely will hurt investment, which has a large component of sunk costs; volatility increases uncertainty as to future returns, leading firms to postpone investment decisions.

Evidently, as the Asian story illustrates very well, the real exchange rate tends to appreciate with sustained, outward–oriented growth. In fact, appreciation is simply a manifestation of long–term growth in productivity and real incomes, the well–known Balassa–Samuelson effect. The issue hinges on the rate at which capital inflows enter the economy. If their size is excessive for the short–term or medium–term ability of the domestic economy to absorb them as real investment, premature appreciation will ensue, with some of the undesirable consequences noted above.

Clearly, the exchange–rate impact of capital inflow is particularly relevant to the current foreign capital surge in Chile and the rest of Latin America. As observed, sharp exchange–rate appreciations have accompanied capital inflows since the late 1980s (see Calvo *et al.*, 1993). On the other hand, with the exception of Chile, investment rates in practically all Latin American countries that have received large inflows have barely budged. In Chile, as already discussed, the investment rate has risen significantly during the recent foreign capital surge. It is possible, however, that the rise in investment has not been sufficient to absorb the capital inflow at an unchanged exchange rate. Hence, as Figure 5.3 shows, the exchange rate has appreciated, albeit more moderately than in other Latin American countries. Also, real exchange–rate appreciation would have been considerably more pronounced without the policies implemented to discourage the more volatile kinds of capital inflows.

Econometric Testing of the Model

This discussion (and the formal derivations in the appendix) suggests that the long–run equilibrium investment function for the economy as a whole is of the following type (with the signs of the effects of changes in the explanatory variables indicated above each variable):

$$\overset{+\quad +\quad +\quad +\quad -\quad ?}{I = I(Y,\ \Delta G,\ C,\ F^*,\ i,\ e)} \tag{10}$$

Linearizing and expressing the relationship in a form that can be estimated econometrically:

$$I_t = \alpha_0 + \alpha_1 Y_t + \alpha_2 \Delta G_t + \alpha_3 C_t + \alpha_4 F_t^* + \alpha_5 i_t + \alpha_6 e_t + u_t \quad (11)$$

Equation (11) is estimated with annual data for 1960 through 1994 within a co–integration framework. That is, first obtain long–run equilibrium relationships between investment and its explanatory variables and then explore the short–term dynamics of investment behaviour[20]. Two sets of equations were run, one for private fixed investment (IPRIV)[21] and the other for investment in machinery and equipment (IME). Capital inflows more likely exert an influence on investment in machinery and equipment than on total investment, in which residential and non–residential construction (both non–tradables) have large weights. The estimates used real M2 (obtained as the geometric average of M2 at the beginning and end of the year) as a share of GDP as the proxy for the availability of domestic credit. Total capital inflow was deflated by the index of external prices applicable to the Chilean economy from 1977 onward[22]. This index was spliced backwards to 1960 with an index of external prices constructed by Ffrench–Davis (1984) to obtain a real capital inflow series for the entire 1960–94 period.

Following standard practice, the real exchange rate is here defined as the nominal market price for the US dollar deflated by the consumer price index and multiplied by an index of external prices (IEP)[23]. Interest rates came from three sources: for 1960–70, the calculations of real borrowing costs made by Ffrench–Davis (1973, p. 298); for 1971–74, real interest rates calculated from the maximum legal lending rate and consumer price inflation; and for 1975 onwards, the real lending rates on 90–day to 360–day loans published by the Central Bank. Beginning in 1979, when loans began to be made in real terms, the interest rate data represent *ex ante* real rates. An indicator of excess capacity was also calculated, for use in the error–correction model. It was derived using the peak–to–peak method of estimating potential output. During 1960–95, peaks are detected in 1963, 1966, 1971, 1981, 1989, 1992, and 1995.

According to the Augmented Dickey–Fuller test, all variables (including the excess capacity index) are integrated of order one, with the exception of real M2, which is integrated of order 2, and the real interest rate and capital inflows other than FDI, which are stationary (see Table 5.5). Therefore, the regressions used levels for all variables, except for M2, for which they used the change. This makes good economic sense: it is likely that the credit restriction affecting investment (a flow variable) is the increase in the money supply (another flow variable), rather than its absolute level (a stock variable). In the co–integration equations, even though they are stationary variables, the real interest rate and capital inflows other than FDI are added to the equations together with the I(1) variables. Without these two I(0) variables, the equations co–integrate, which allows adding stationary variables that make theoretical sense. The real interest rate is made to interact with a dummy variable (DUM2) that takes the values of zero between 1960 and 1974, a period characterised by pervasive intervention in financial markets, and one for the period beginning in 1975, when financial markets were liberalised[24].

Table 5.5. **Augmented Dickey Fuller Unit Root Tests**

(all tests without constant and without trend)

	Number of Lags	t statistic
IPRIV	0	2.42
dIPRIV	0	-3.67**
IME	0	1.80
dIME	0	-4.00**
GDP	0	4.27
dGDP	0	-2.70**
IPUB	0	-0.67
dIPUB	0	-6.94**
F	0	-1.49
dF	0	-7.58**
FDI	0	-0.26
dFDI	0	-3.81**
FOTH	0	-2.16*
M2	1	1.74
dM2	0	-1.60
ddM2	1	-5.46**
RER	0	0.76
dRER	0	-8.87**
INTR	1	-5.10**
EXCAP	0	-1.38
dEXCAP	0	-4.81**

*   Significantly different from zero at the 5 per cent level.
**   Significantly different from zero at 1 per cent level.

Definition of variables: IPRIV = gross private investment; IME = investment in machinery and equipment; IPUB = public investment; RER = real exchange rate; F = real capital inflows; FDI = foreign direct investment; FOTH = other capital inflows; INTR = real lending interest rate; EXCAP = excess capacity indicator (percentage of full capacity output). d indicates annual change; dd is the change in the annual change.

Table 5.6 shows the results of the long–run equilibrium relationships for IPRIV and for IME. According to the McKinnon criterion, both investment equations co–integrate. Since neither capital inflow (F) nor public investment (IPUB) turned out to be significant explanatory variables of IPRIV, they were excluded from the final set of equations selected as good representations of the long–run relationships. As regards the equation for IME, the real interest rate was not significant and was excluded. The estimates of the investment equations are good from the point of view of standard statistical inference tests[25].

Table 5.6. **Cointegration Equations**

	IPRIV			IME	
	(1)	(2)	(3)	(4)	(5)
Constant	-17 915	10 124	5 647	2 358	18 483.0
	(-0.32)	(0.18)	(0.10)	(0.52)	(0.40)
GDP	0.183	0.184	0.189	0.083	0.087
	(6.39)**	(5.83)**	(6.89)**	(3.99)**	(4.16)**
DUM1xGDP	(0.044)	0.042	0.040	0.035	0.034
	(4.41)**	(3.88)**	(4.21)**	(4.83)**	(4.57)**
IPUB				0.432	0.397
				(2.33)*	(2.13)*
dM2	60.136	48.074	48.590	43.727	39.839
	(3.56)**	(2.74)*	(2.84)**	(3.88)**	(3.44)**
F				31.814	
				(4.04)**	
FDI		63.909	62.321		58.534
		(1.94)	(1.95)		(2.56)*
FOTH		3.345			30.344
		(0.29)			(3.85)**
RER	-1 016.5	-1 730.2	-1 809.8	-948.21	-1 316.3
	(-1.64)	(-2.22)*	(-2.53)*	(-2.12)*	(-2.48)*
DUM2xINTR	-1 822.0	-1 630.0	-1 570.5		
	(-2.89)*	(-1.94)	(-2.56)*		
R^2	0.976	0.979	0.979	0.973	0.974
DW	1.70	1.86	1.89	2.17	2.20
Breusch-Godfrey	0.88	0.58	0.55	0.27	0.18
MacKinnon test	-5.85**	-6.34**	-6.35**	-5.96**	-6.00**

*   Significant at 5 per cent level.
**   Significant at 1 per cent level. Figures in parenthesis are t-ratios. Breusch-Godfrey test in F form.

A recursive Chow test allowed a determination that there had been structural change in 1990. In addition, recursive least squares analysis revealed that it was the parameter associated with GDP which increased significantly in value after 1989. In other words, the responsiveness of investment to GDP appears to have risen significantly after 1989, perhaps because expectations of future growth have become more firmly held. This allowed addition of a dummy variable, made interactive with GDP, taking the value of unity for 1989–94. It turns out to be very significantly related to investment. Thus in the 1990s the responsiveness of private investment and that of investment in machinery and equipment to an increase in GDP appear to have jumped, respectively, by about a quarter and a third.

While capital inflows (F) are not a significant explanatory variable in the equation for IPRIV, they are very significant in the equation explaining IME. This gives a clear indication of the main channel through which capital inflow influences investment: it evidently relaxes the foreign exchange constraint, enabling the economy to import a larger flow of capital goods. Also, in the long run the real exchange rate (RER) is negatively (and significantly) associated with IME, which implies that real exchange rate appreciation, by cheapening the relative prices of capital goods, does indeed stimulate investment. Thus, a second order positive effect of capital inflow on investment, *in the long run*, appears to operate through the impact of capital inflow on the real exchange rate, and from a lower real exchange rate to lower relative prices of imported machinery[26].

The analysis of the first two sections of this paper gives rise to the hypothesis that it is not total capital inflow that should affect investment but only its long–term component. In order to test this hypothesis, total inflows were disaggregated into FDI and other inflows (FOTH)[27] and were introduced as explanatory variables of IPRIV and IME. As already noted, while FDI in an I(1) variable, FOTH is stationary. This permits treatment of FOTH as a variable reflecting transitory disturbances.

These results are also shown in Table 5.6. Whereas total capital inflows do not significantly affect IPRIV, FDI turns out to be positively and significantly associated with it. On the other hand, as shown in equation (2) of Table 5.6, FOTH is not significantly related to IPRIV. As regards IME, both FDI and FOTH enter as statistically significant variables, but the coefficient of FDI is more than twice the absolute magnitude of the coefficient associated with FOTH. A Wald test rejects the hypothesis that these two coefficients are equal. In other words, FDI is a much more important variable affecting investment expenditures than other types of flows. This finding could partially explain why capital inflow has been positively associated with investment during the current foreign capital surge, which has been dominated by FDI, and not during the boom in capital inflows of 1978–81, during which flows intermediated by private banks were much more important than FDI.

As Figure 5.3 reveals, the behaviour of the real interest rate shows significant shifts since 1960. During the 1960s, the considerable fluctuations in real rates were, on the whole, positive. Severe financial repression and very negative real interest rates marked the early 1970s. After financial liberalisation in 1975, the real interest rate jumped to exorbitant levels, surely one of the causes of the poor investment performance of the second half of the 1970s. As a result of the 1982–83 depression and as prudential regulations strengthened in the aftermath of the 1982 banking crisis, real rates settled down to reasonable levels by the mid 1980s and they have since remained extremely stable. This recent behaviour of interest rates favoured an expansion in private investment. This is, in a nutshell, what the equation for IPRIV tells us.

To study the short–term dynamics of IPRIV and IME two options for modelling the error correction equations are explored. One explains the changes in investment in a fairly conventional manner by (among other variables) the changes in GDP. The second introduced an excess capacity indicator as an explanatory variable[28]. The idea is straightforward: during periods of excess capacity, firms will not increase investment

in non–exportables even when increases in demand may otherwise appear to warrant larger investments. Conversely, when the economy is close to capacity output, investment will respond more briskly to increases in demand.

Figure 5.4 shows a strong inverse correlation between the excess capacity indicator and private investment. Since the late 1980s, the Chilean economy has operated close to full capacity output. This may partly explain why investment rates have been strong. By contrast, and with the exception of 1980–81, quite a bit of slack existed between 1973 and the late 1980s, and, consequently, investment performance was poor.

Figure 5.4. **Excess Capacity** (percentage)
and Private Fixed Investment (percentage of GDP)
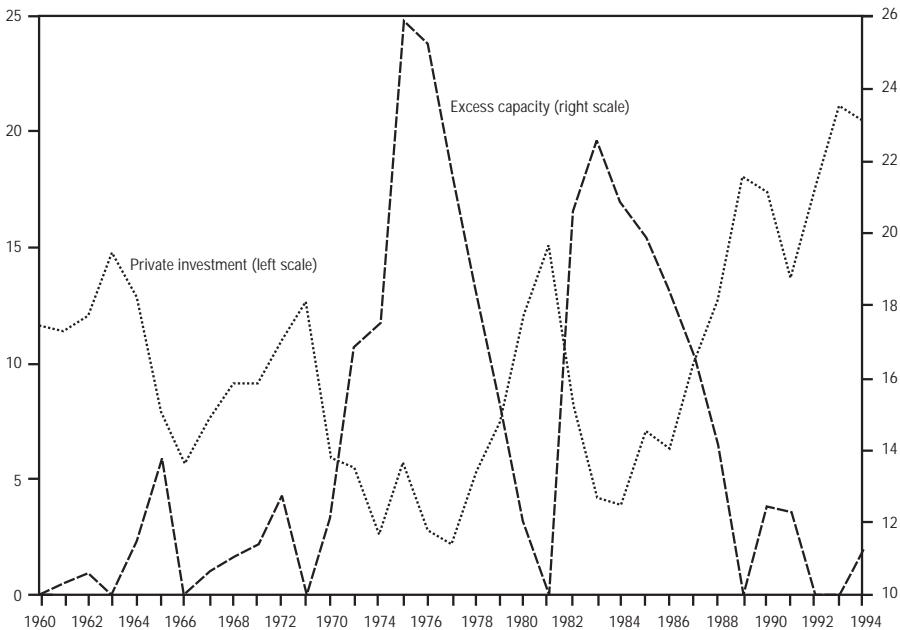
Source: Author calculations, based on Central Bank of Chile data.

Both approaches to the error–correction model work well from a statistical point of view (see Tables 5.7 and 5.8). For both estimated equations, adjustment to disequilibria is fast and almost of the same size: between 70 per cent and 80 per cent of the disequilibria are corrected within one year. As expected, excess capacity is negatively (and strongly) correlated to changes in investment. Since equation (1) for changes in private investment *(dIPRIV)* seriously misperforms in 1989, when it underestimates the increase in private investment, and in 1991, when it overestimates it, two dummy variables were added, one for 1989 and the other for 1991. For both *dIPRIV* and the change in investment in machinery and equipment *(dIME)*, a small number of variables explains disequilibrium dynamics. In the case of *dIPRIV*, they are changes in excess capacity, in credit conditions *(ddM2),* and in FDI. For *dIME*, they are changes in excess capacity and in capital flows. Thus, in the Chilean case, capital inflows (and especially FDI) have been positively associated with investment in the short run as well as in the long run[29].

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Table 5.7. **Error – Correction Equations for Private Investment**
(Dependent Variable: dIPRIV)

	(1)	(2)	(3)	(4)
Constant	-9 362.5	-14 199	29 369	28 331
	(-1.09)	(-1.38)	(2.69)*	(2.454*
RES$_1$	-0.743	-0.781	-0.813	-0.796
	(-4.49)**	(-3.89)**	(3.34)**	(-3.07)**
dGDP	0.300	0.323		
	(6.64)**	(6.56)**		
dEXCAP			-9 853.8	-11 801
			(-4.09)**	(-5.56)**
ddM2	32.929	28.756	31.931	
	(2.65)*	(1.97)	(1.67)	
dFDI		88.711		87.958
		(2.70)*		(2.03)*
DUM3	1.417e+05			
	(3.08)**			
DUM4	-1.140			
	(-2.72)*			
R^2	0.850	0.780	0.612	0.603
DW	1.81	1.74	1.29	1.34
Breusch-Godfrey	0.188	2.29	2.86	2.87

Notes:	RES$_{-1}$	=	For equations (1) and (3) lagged residuals of equation (1) in Table 5.6; for equations (2) and (4) lagged residuals of equation (3) in Table 5.6.
	DUM3	=	Dummy variable with 1989=1.
	DUM4	=	Dummy variable with 1991=1.
*			Significant at 5 per cent level.
**			Significant at 1 per cent level. Breusch-Godfrey test in F form.

Table 5.8. **Error – Correction Equations for Investment in Machinery and Equipment**
(Dependent Variable: dIME)

	(1)	(2)	(3)	(4)
Constant	-8 552.9	-10 728	17 447	16 218
	(-1.16)	(-1.49)	(2.35)*	(2.16)*
RES$_{-1}$	-0.702	-0.662	-0.738	-0.676
	(-3.74)**	(-3.33)*	(-3.01)**	(-2.67)*
dGDP	0.202	0.207		
	(5.42)**	(5.78)**		
dEXCAP			-6 609.4	-6 776.4
			(-4.11)**	(-4.20)**
ddM2	13.856	15.189		
	(1.32)	(1.49)		
dF	30.822		35.216	
	(4.57)**		(4.23)**	
dFDI		75.402		75.981
		(3.34)**		(2.61)*
FOTH		28.030		32.923
		(4.23)**		(3.88)**
R^2	0.814	0.836	0.703	0.714
DW	1.62	1.64	1.21	1.20
Breusch-Godfrey	1.79	1.44	2.81	2.99

Notes: RES$_{-1}$ = For equations (1) and (3) lagged residuals of equation (4) in Table 5.6; for equations (2) and (4) lagged residuals of equation (5) in Table 5.6.

*   Significant at 5 per cent level.

**   Significant at 1 per cent level. t-ratios in parenthesis. Breusch-Godfrey test in F form.

Conclusions

Capital inflows in Chile have had a favourable impact on investment, particularly investment in machinery and equipment. Why has this been so? During most of the postwar period, the availability of foreign exchange has constrained the growth of the Chilean economy and the most recent period of foreign exchange abundance thus is clearly atypical. With binding foreign exchange and domestic credit constraints on investment, the theoretical model tells us that foreign capital inflows, by relaxing these constraints, likely will have a positive impact on investment. The econometric results simply corroborate this presumption. Therefore, capital inflows in economies such as Chile's have two long–term positive effects on investment: on the one hand, they relieve the foreign exchange and credit constraints; and on the other, *via* exchange–rate effects, they make imported capital equipment cheaper.

Different types of foreign capital inflows have different impacts on investment. FDI associates more directly with real investment than other types of flows. In Chile, FDI also behaves much more like a "permanent" variable and exhibits a much greater degree of persistence than portfolio capital or short–term private borrowing, which are much more volatile and behave more like "transitory" disturbances.

With foreign exchange abundant, as they have been since the late 1980s, the effects of capital inflow on investment and long–term growth performance will depend crucially on the policy mix used to manage inflows. Policies that favour FDI and discourage transitory flows likely will maximise the positive effects of capital inflow on investment. This can be understood best by positing a counterfactual in which there are no limits to capital inflow. The unrestricted liberalisation of the capital account, in the face of sharp increases in their supply, may lead to a surge in transitory flows, with unfavourable effects on investment and growth in the long run. By causing a large (and, one must always remember, reversible) appreciation of the real exchange rate, such surges have a negative impact on investment in tradables which could outweigh the positive effects on investment in non–tradables and, more generally, the spur to investment stemming from lower prices for capital goods. Moreover, the size of the domestic market places limits on the expansion of the non–tradable sector which are rapidly reached and which cause the impulse to investment and growth to dissipate in a few years.

This may be one reason why the upswing in investment during the late 1970s, which lasted only from 1977 through 1981 (see Figure 5.4), was so short–lived (for a similar interpretation, see Solimano, 1990). During this period, an unrestricted liberalisation of the capital account of the balance of payments led to a huge increase in transitory capital inflows and to a sharp appreciation of the exchange rate, which in turn acted as a severe disincentive to investment in tradables. By contrast, the current upswing in investment has run for over a decade in spite of large capital inflows for a good part of the period; but, again in contrast to what happened during the late 1970s, FDI has dominated these inflows, transitory flows having been discouraged by the mix of policies used to manage capital inflow.

The results obtained and the data assembled facilitate an attempt to explain the good investment performance of the Chilean economy since the late 1980s and the positive association between investment and capital inflows that emerges from the analysis.

— *First*, brisk growth has been associated with expansions of capacity output rather than with increases in output towards its full capacity level.

— *Second*, interest rates have remained reasonable and very stable, largely owing to very effective prudential bank supervision. Third, the recovery of the banking system after the 1982 crisis has meant rising credit to the private sector and increasing levels of financial deepening of the Chilean economy, which may have relieved liquidity constraints to investment.

Last but not least, capital inflows have relaxed the foreign exchange and credit constraints, but capital inflow has been managed to prevent excessive exchange rate appreciation. During periods of foreign exchange abundance, in order to maintain investment rates and long–term growth while avoiding "premature" exchange rate appreciation, more sophisticated policies towards capital inflows seem needed than during times of foreign capital shortage. Thus policies to discourage the more volatile flows, which are also not directly related to investment, while maintaining an open regime for FDI, could well have contributed to the positive impact of capital inflow on investment during the most recent episode of foreign capital abundance.

The behaviour of investment during the current foreign capital surge contrasts sharply with its evolution during the capital inflow episode of 1977–81. Then, capital inflows were completely liberalised, the real exchange rate appreciated sharply, consumption rose, domestic saving declined — and the upsurge in investment aborted. Other factors inhibiting investment were also present in 1977–81: excess capacity much larger than in recent years and real interest rates much higher, partly because, in an unregulated environment, lending for speculative purposes at inordinately high interest rates crowded out productive investment. The results were poor from the point of view of long–term growth and investment performance. By and large, the economic authorities have assimilated the lessons.

Notes

1. With the exception of the second round of privatisations, which started in 1985.

2. This partly reflects the effects of the debt crisis itself, which led to the dramatic real devaluations of 1982–85, with the consequent fall in the dollar value of Chilean GDP.

3. This chapter follows the Latin American convention of defining the exchange rate as units of domestic currency per unit of foreign exchange. Therefore, an appreciation is a downward movement.

4. It has been argued (e.g. Williamson, 1997) that foreigners who become pessimistic about a country will sell their ADRs in the United States stock market, therefore having no impact on the domestic stock and foreign exchange markets. However, this argument ignores that the issuance of ADRs implies that stock prices in the domestic and United States markets must tend to equality through arbitrage. Therefore, when ADR prices in the US market fall, there is an incentive for ADR holders to sell on the Chilean market.

5. The constant price series was derived by deflating the dollar inflow series by an index of foreign prices faced by the Chilean economy. As for the denominator, GDP at constant 1986 prices was transformed to 1986 dollars using the 1986 peso–dollar exchange rate.

6. In 1990, there was a policy–induced slowdown in economic growth, as the economy was overheated (for electoral reasons) during the last year of military rule (1989). Thus one can distinguish a "mini" business cycle with a peak in 1989, a trough in 1990, and a subsequent peak in 1992, a year of exceptional economic growth.

7. Of course, the composition of inflows has changed dramatically, public flows predominating during the 1960s and during the debt crisis and bank lending being the most important form of capital inflow in the 1970s. As already noted, during the most recent foreign capital surge, inflows have been mostly private, with a predominance of FDI.

8. For a comparative analysis of bands in Chile, Israel and Mexico, see Helpman, Leiderman and Bufman (1994). For an analysis of Chile, Colombia and Israel, see Williamson (1996).

9. Keep in mind that a significant portion of FDI is financed with long–term borrowing from international financial markets, which are subject to the reserve requirement. For these and other long–term borrowings, there is the option of paying the financial cost of the reserve requirement rather than leaving the funds on deposit for one year. That the

implicit tax rate on foreign borrowing falls off sharply with maturities and becomes negligible (as a proportion of the value of the loan) for long–term loans, suggests that the policy must have had no measurable effects on FDI. In fact, FDI has kept on increasing.

10. This is not the place to pick an argument with Claessens, Dooley, and Warner (1995). Part of the explanation for their result that FDI is just as likely to be volatile as short–term flows, however, may arise because, for the countries they chose, FDI flows are a very small percentage of total foreign financing, at least as reported by IMF statistics (which, by the way, sometimes seriously underestimate FDI). Fluctuations of small numbers tend to be larger than fluctuations of large ones.

11. The minimum lag which produces white–noise residuals.

12. To obtain private investment, central government investment (excluding that of public enterprises) was subtracted from gross fixed capital formation. Therefore, private investment is here defined as corporate gross capital formation, including the investment of public corporations, plus household investment in housing.

13. Alternatively, one can think of the economy as composed of two groups of firms, one producing tradables and the other producing non–tradables, even adding a further differentiation of tradable firms between those producing importables and those producing exportables. If, in the import competing sector, there is either product differentiation or high tariffs protecting domestic production, such goods can be treated as non–tradables for the purpose of this model. However, the results remain essentially the same as in this simplified rendition.

14. For simplicity, we ignore subscripts for the coefficients of the production functions.

15. Since $\rho < 0$, the existence of equilibrium requires that $\varepsilon > 1$.

16. Not surprisingly, most econometric modeling of the real exchange rate has found that capital inflows are inversely related to the exchange rate. For the case of Chile, see Agosin, Fuentes, and Letelier (1994), Elbadawi (1994), Elbadawi and Soto (1994) and Repetto (1994).

17. This is a simplifying assumption. As already noted, some importables can be treated as non–tradables or as imperfectly traded goods. In this case, aggregate demand would, of course, have an effect on a segment of the tradable sector. This consideration strengthens the expectation of finding a positive long–run relationship between the level of aggregate demand and investment.

18. Many empirical studies of investment in developing countries fail to find a significant interest rate effect on investment (Rama, 1993).

19. This is not strictly true in all cases. In some goods (primarily copper, but also out–of–season fruit, pulp, wood, and fishmeal), Chilean firms have already conquered large shares in some importing markets. For a niche exporter like Chile, this fact makes continued export diversification imperative in order to sustain long–run growth.

20. The availability of data (35 observations) and the large number of explanatory variables to take into account preclude the use of a full–fledged VAR using Johansen's methodology, which would have been desirable in order to take into account possible causal relationships

between the variables. However, in an exercise estimating a VAR with two lags (determined to be optimal) for the investment equation alone, the results were practically identical to those obtained with the co–integration equation.

21. As already noted, this series (which is in 1986 prices) includes investment by public corporations.

22. The IEP is an index of wholesale prices in dollars of Chile's main trading partners weighted by the importance of each partner in Chilean imports.

23. For the period since 1977, Central Bank estimates of the real exchange rate are available. Calculations for earlier years used for foreign prices the IEP constructed by Ffrench–Davis (1984). For 1974–76, official statistics underestimate the rate of increase in the CPI and, therefore, overestimate the extent of real exchange rate depreciation. The real exchange rate index used in this study corrects for the underestimation of the CPI during that period.

24. As Figure 5.3 shows, real lending rates during the 1960s were positive in most years, which means that financial repression was not as severe as in the early 1970s. Nonetheless, there was significant intervention in financial markets, which justifies the procedure used in this paper of considering the real interest rate affecting investment decisions to have been effectively zero for 1960 through 1974.

25. Since all variables (with the exception of the interest rate) are $I(1)$, the t–statistics have an upward bias and are presented only for illustrative purposes.

26. It was possible to include both *RER* and *F* in the equation explaining IME without running into problems of multicollinearity because, in the longish time period for which we have data (1960–94), the correlation coefficient between *RER* and *F* is very low.

27. FDI figures are from Central Bank data for 1970 through 1994. For 1960–69, FDI data were taken from Ffrench–Davis (1973, p. 278).

28. Strictly speaking, the variable used is the change in excess capacity, since excess capacity is an $I(1)$ variable.

29. Note that, in the error correction specification, the *changes* in FDI and the *levels* of other flows are used as explanatory variables, because, as noted above, FDI is $I(1)$ and FOTH is $I(0)$.

Deriving the Signs of the Long–Term Equilibrium Investment Equation

Differentiating equilibrium condition (6) by *Y, C, G, i* and *e*, one can obtain the signs of the effects on investment of changes in these variables:

$$\frac{\partial I_1}{\partial Y} \;=\; \frac{-\eta * I_1}{\rho * Y} \;>\; 0$$

$$\frac{\partial I_1}{\partial G} \;=\; \frac{-\phi * I_1}{\rho * G} \;>\; 0$$

$$\frac{\partial I_1}{\partial C} \;=\; \frac{\varepsilon * p_k^{*2} e(1+i) I_1}{\alpha\rho(\varepsilon - 1)[A]} * \frac{\partial \lambda_{11}}{\partial C^*} \;\geq\; 0$$

$$\frac{\partial I_1}{\partial i} \;=\; \frac{\varepsilon^2 p_k^* [e(1+\lambda_{11}) + \lambda_2] I_1}{\alpha\rho(\varepsilon - 1)[A]} \;<\; 0$$

$$\frac{\partial I_1}{\partial e} \;=\; \frac{\varepsilon^2 (1+i) p_k^* (1+\lambda_{11}) I_1}{\rho\alpha[A]} \;<\; 0$$

One can do likewise for investment in tradables by differentiating equilibrium condition (7) by these same variables (with the exception of Y, which does not appear in the equation):

$$\frac{\partial I_2}{\partial G} = \frac{-\beta * I_2}{(\alpha - 1) * G} > 0$$

$$\frac{\partial I_2}{\partial C} = \frac{I_2}{(\alpha - 1) * [B]} * \frac{\partial \lambda_{12}}{\partial C} \geq 0$$

$$\frac{\partial I_2}{\partial i} = \frac{I_2}{(\alpha - 1)(1 + i)} < 0$$

$$\frac{\partial I_2}{\partial e} = \frac{e^{-2} \lambda_2 I_2}{(1 - \alpha)[B]} \geq 0$$

The signs of the derivatives with respect to Y and G are straightforward enough and depend only on the signs of the parameters in the respective expressions. On the other hand, the signs of the derivatives with respect to C depend crucially on how the shadow prices of domestic credit respond to an increase in its supply to each firm. If the domestic credit constraints are binding, $\partial \lambda_{1j}/\partial C < 0$, and $\partial I_1/\partial C, \partial I_2/\partial C > 0$. If the domestic credit constraints are not binding, $\lambda_{1j} = 0$ and $\partial \lambda_{1j}/\partial C = 0$. This implies that $\partial I_1/\partial C, \partial I_2/\partial C = 0$. Interest rate effects are as predicted in conventional theory: an increase in i should, *ceteris paribus*, reduce I_1 and I_2. As regards the effects of exchange rate changes on investment, the model yields ambiguous conclusions. An appreciation should stimulate I_1 and discourage I_2, with an uncertain net effect.

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VI

Capital Flows, Savings and Investment in Colombia, 1990–96

José Antonio Ocampo and Camilo Tovar

ABSTRACT

This paper analyses the nature of external capital flows, the effects of macroeconomic policies aimed at affecting the size and composition of such flows, and their relation to the evolution of savings and investment in Colombia in the 1990s. It shows that the partial liberalisation of the capital account, particularly in September 1993, led to a boom in external financing. Interest rate differentials, associated with the joint effect of monetary and exchange rate policies, also contributed. Nonetheless, Colombia maintained significant price–based controls, which effectively reduced the amount of external financing used and induced a favourable debt profile. Evidence also suggests that external financing substituted for household savings and encouraged investment by private firms. The joint effects of increased capital flows and taxation on private savings became the major determinants of the sharp increase in the private deficit in the early 1990s. At an aggregate level, however, increased taxes had a positive effect on savings, through their positive effect on public sector saving. Trade liberalisation had no direct effect on savings. Nonetheless, trade liberalisation and revaluation reduced the relative price of machinery and equipment, stimulating investment by private firms. The chapter concludes that unsustainable macroeconomic policies accompanied the private external financing and investment boom of the early 1990s. It calls for a balanced policy mix, including price–based controls on capital flows.

Introduction

A complex interaction of structural reforms, shifts in macroeconomic policy and shocks in the capital account has determined Colombian economic performance in the 1990s. External capital flows have played a major role. This chapter analyses the nature of capital flows, the effects of macroeconomic policies aimed at affecting the size and composition of such flows, and their relation to the evolution of savings and investment. It has four sections. The first reviews macroeconomic events. The second analyses the evolution and determinants of capital flows. The third considers the links between capital flows, savings and investment. The chapter ends with a short section of conclusions.

Macroeconomic Events in the 1990s

Major shifts in the pattern of growth that had marked the second half of the 1980s characterised the early 1990s in Colombia. The more important elements of macroeconomic policy adopted in the mid–1980s had included an active devaluation policy, a return to fiscal orthodoxy and reduced reliance on external financing. The fiscal and current account deficits which had typified the first half of the decade were back under control and, indeed, the economy had started to run balance of payment surpluses in some years. Accelerated by the short–lived coffee boom of 1986, moderate economic growth returned, led by the tradable sectors. Despite high tariff and non–tariff protection, non–traditional exports boomed. The development of major oil, coal and nickel deposits supported the export expansion. At the end of the export boom in 1991, exports of goods and services had reached 22.7 per cent of GDP versus an average of 14.4 per cent in 1980–85. Exports of goods significantly diversified between 1985 and 1991; the share of coffee in total exports declined from 49.3 per cent to 18.4 per cent as that of non–traditional exports increased from 32.1 per cent to 49.1 per cent and that of mineral exports from 18.6 per cent to 32.6 per cent.

The resilience of domestic inflation constituted the major flaw in this process. Moreover, after peaking in 1986–87, growth tended to slow. Dissatisfaction with macroeconomic performance and the demonstration effects of similar policies in other countries led to the wave of structural reforms adopted at the end of the Barco Administration (August 1986–August 1990) and the early part of the Gaviria Administration (August 1990–August 1994). Parallel events had led to major political reforms, reflected particularly in the drafting of a new Constitution in 1991; it had important implications for the economic reforms underway.

In external policy, the process included major trade and foreign direct investment liberalisation and a reform of the foreign exchange regime. Domestic reforms complemented it: the creation of an independent central bank; a reform of the domestic financial system designed to increase competition among intermediaries; rapid fiscal decentralisation, accelerating a process which the Betancur Administration had unleashed in the mid–1980s; modest privatisation and a more ambitious design of new rules for private participation in social services and infrastructure; and moderate change in the labour regime along with more ambitious reform of the social security system.

Contrary to international patterns, a significant expansion of public expenditure accompanied this process, financed largely by higher fiscal revenues. Increased expenditures joined new state responsibilities in the judicial and social areas, along with a rapid increase in transfers to the regions for social expenditure, all decreed by the 1991 Constitution and the laws which implemented it. Increased resources for the armed forces reinforced the expansion of public expenditure.

This pattern of reforms has continued since August 1994 under the Samper Administration and indeed has tended to accelerate through private participation in areas traditionally reserved to the State. Nonetheless, increasing (although, by international standards, still moderate) fiscal deficits have led to efforts to reduce public expenditure since mid–1995.

Macroeconomic policy has been subject to significant changes throughout the period. The evolution of major macroeconomic variables is shown in Tables 6.1 and 6.2 and Figures 6.1 to 6.3. Economic policy evolved in five major phases.

Phase I: Nominal devaluation accelerated from mid–1989 in response to the collapse of the International Coffee Agreement and as a preparation for trade liberalisation. The Barco Administration initiated trade reform in February 1990; the Gaviria Administration decreed the virtual elimination of non–tariff barriers and announced a three–year tariff reduction schedule in November 1990. With moderate growth (4.3 per cent in 1990), particularly in non–tradable activities, inflation accelerated, reaching 32 per cent by the end of 1990. By then, a fairly general consensus had emerged that exchange rate devaluation had become the critical factor behind poor inflation performance.

Phase II: As a response to rising inflation, a drastic stabilisation policy was implemented in December 1990/January 1991. Its basic elements included massive open market operations, 100 per cent marginal reserve requirements on most deposits in the financial system and a reduction in the rate of crawl of the peso. As a result, real interest rates increased, led by open market operations of *Banco de la República*, and real domestic credit decreased. Central government finances became moderately contractionary, no doubt facilitated by the 1990 tax reform which increased the basic VAT rate from 10 per cent to 12 per cent. Driven especially by contractionary monetary and credit policies, domestic demand came to a standstill, inducing a "Colombian–style" recession. Inflation declined with a lag.

Monetary control had self–defeating elements, however. Some argued that high domestic interest rates together with the slowdown in the rate of devaluation generated massive incentives for capital inflows, which entered the country despite foreign exchange controls. Further, the amnesty on foreign exchange holdings decreed in the 1990 tax reform facilitated the repatriation of capital held abroad; such holdings had been illegal under previous exchange controls. Equally important, correction of exchange rate undervaluation moved slowly and imports declined as a result of domestic recession[1]. Both factors led to a rapid increase in the current account surplus, which reached 3 per cent of GDP in 1991 (it probably was overstated as a result of capital inflows filtered through the trade and service accounts). Reserve accumulation

Table 6.1. **Colombia: Policy and Policy Induced Variables**

	1975-79	1980-85	1986-90	1991-96	1990	1991	1992	1993	1994	1995	1996
Real Exchange Rate (1986 = 100)	78.6	70.8	100.1	101.7	111.5	108.3	102.8	103.4	95.6	96.5	94.1
Real Interest Rate											
Open Market Operations			4.5	4.1	6.7	8.4	-3.3	2.1	4.1	9.0	6.7
Deposit Rate (90 days)		10.3	6.4	4.3	4.9	4.5	-0.4	2.5	5.4	9.4	8.4
Average Lending Rate			14.1	12.8	12.6	12.8	8.1	10.9	14.3	17.9	17.2
Growth of Real Domestic Supply											
M1	4.1	0.2	2.7	1.9	-15.4	-1.2	9.9	8.5	6.7	-11.2	-1.7
M2	9.0	8.1	3.6	8.8	0.8	-2.0	13.3	11.9	14.2	6.5	0.5
M3		10.3	4.0	9.6	1.1	-2.0	11.3	13.3	15.2	10.9	0.7
Open Market Operations			1.6	3.7	2.3	6.3	6.1	3.9	1.9	0.3	0.7
(End-Year Liabilities as a % of GDP)											
Growth of Real Domestic Credit		5.6	8.5	10.0	10.5	-7.6	1.0	22.5	20.8	17.0	7.2
Total Government Expenditure (% of GDP)											
DANE (Accruals)	19.8	27.2	27.7	29.6	28.2	28.1	30.0	30.6			
DNP (Cash Payments Net of Transfers)				28.2	24.3	25.1	27.0	28.4	28.1	32.7	36.9
Overall Fiscal Surplus or Deficit	-1.5	-5.3	-1.5	0.1	-0.5	0.0	-0.1	0.1	2.7	-0.1	-1.1
Central Government	-0.2	-3.3	-0.9	-0.7	-0.7	0.4	0.2	-0.3	1.0	-2.4	-3.2
Rest of Public Sector	-1.3	-2.0	-0.6	0.9	0.2	-0.4	-0.3	0.4	1.7	2.3	2.1

Sources: Monetary variables: Banco de la República.
Fiscal variables: Finance Ministry, DANE and DNP.

Table 6.2. **Colombia: Macroeconomic Performance Indicators**

(changes in per cent per year, except when noted)

|	1975-79	1980-85	1986-90	1991-96	1990	1991	1992	1993	1994	1995	1996
GDP Growth	5.0	2.6	4.6	4.1	4.3	2.0	4.0	5.4	5.7	5.4	2.1
Value Added Tradables	4.9	1.8	5.7	3.2	5.4	2.0	2.7	5.4	4.1	4.9	0.0
Value Added Non Tradables	5.1	3.2	3.7	5.2	2.8	2.3	4.9	5.8	8.2	5.7	4.4
Aggregate Domestic Demand Growth	4.8	2.4	3.4	6.8	2.3	0.1	10.0	12.1	9.9	7.1	1.9
Urban Employment	45.8	48.2	50.9	54.4	52.2	53.5	54.6	55.0	54.6	54.5	52.9
(% of Working Age Population)											
(% of Labour Force)	9.4	11.1	11.4	9.3	10.5	10.2	10.2	8.6	8.9	8.8	11.3
Inflation (CPI End Year)											
Average	23.9	26.7	22.3	23.0	32.4	26.8	25.1	22.6	22.6	19.5	21.6
Last Year of Period	28.8	22.4	32.4	21.6							
Exports (% of GDP at 1975 Prices)	15.0	14.4	18.5	22.9	20.7	22.7	23.1	23.3	22.0	22.6	23.1
External Account Balances											
(% of GDP at 1994 Parity Exchange Rate)											
Trade	3.5	-3.1	3.9	0.5	4.2	6.1	2.3	-2.7	-3.3	-3.3	-2.5
Current Account	1.3	-8.1	0.3	-1.3	1.2	4.9	1.7	-3.7	-4.7	-5.4	-5.6

Source: DANE.

accelerated and monetary control became possible only at the cost of massive sterilisation, which increased the accumulated domestic liabilities of *Banco de la República* from open market operations to unprecedented levels (6.3 per cent of GDP by the end of 1991 versus 2.3 per cent one year earlier); due to net interest payments on such liabilities, the quasi–fiscal deficit increased with a lag.

Figure 6.1. **Macroeconomic Variables**

a. GDP and Aggregate Domestic Demand
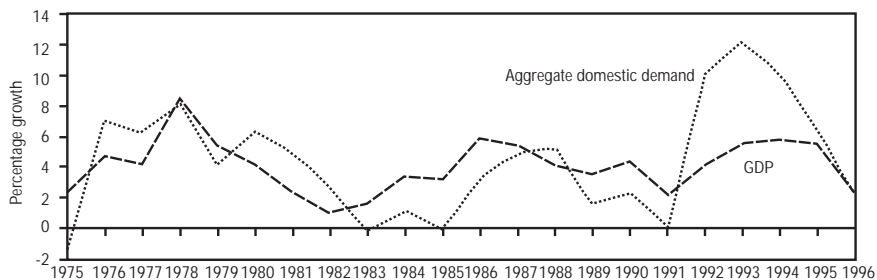
b. Value Added Growth by Economic Sector
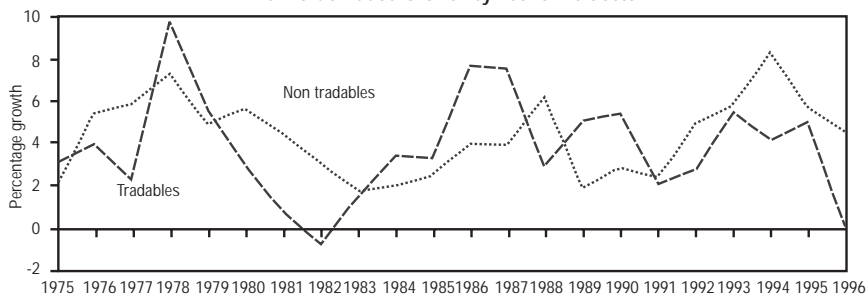
Definitions: Tradables: Agriculture, excluding coffee, mining, industry excluding coffee. Non tradables: services and construction.

c. Inflation (CPI end year)

Source: DANE.

In an attempt to face the growing difficulties of the stabilisation programme, the authorities resorted in June 1991 to a mechanism used in previous foreign exchange booms: they determined that foreign exchange certificates could be redeemed only after three months from their date of issue, but the central bank could purchase them immediately at a 10 per cent discount. Under the foreign exchange regime prevailing

at the time, *Banco de la República* issued these certificates when it bought foreign exchange. The extension of the redemption period had two effects: first, it immediately reduced the price of the certificates, effectively an exchange–rate appreciation; second, it forced domestic agents to hold the certificates, equivalent to an open market operation. The system thus generated both exchange rate flexibility and monetary sterilisation (lagged monetisation of the accumulation of foreign exchange reserves). On the other hand, to reduce short–term external commercial debt, the authorities also decreed that consumer and intermediate goods had to be paid for abroad within six months of clearing customs.

Figure 6.2. **Interest Rates and Domestic Credit**
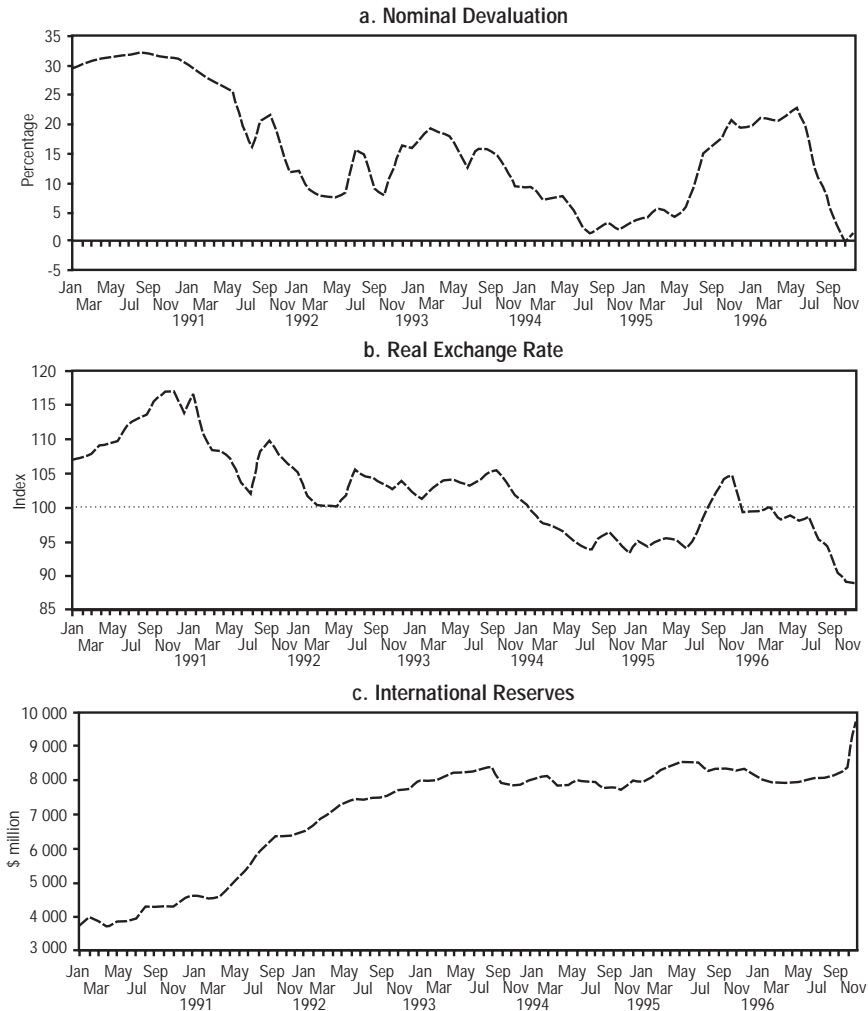
a. **Real Interest Rates**
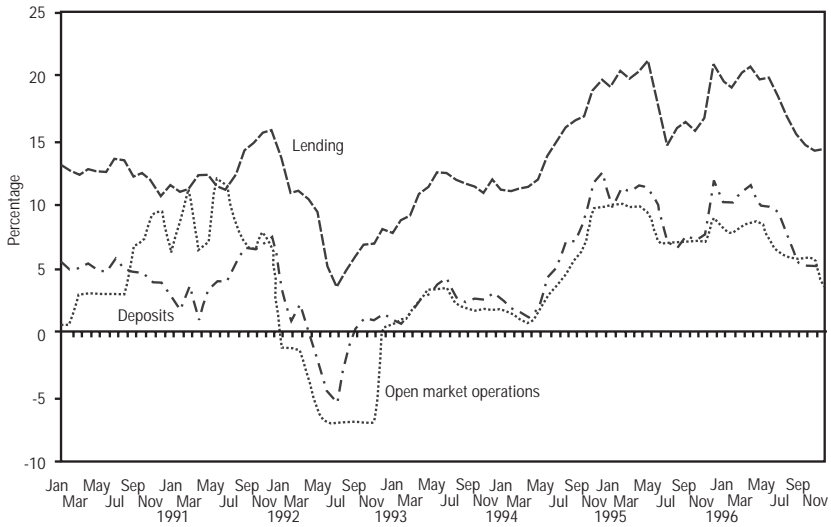
b. **Growth of Real Domestic Credit**
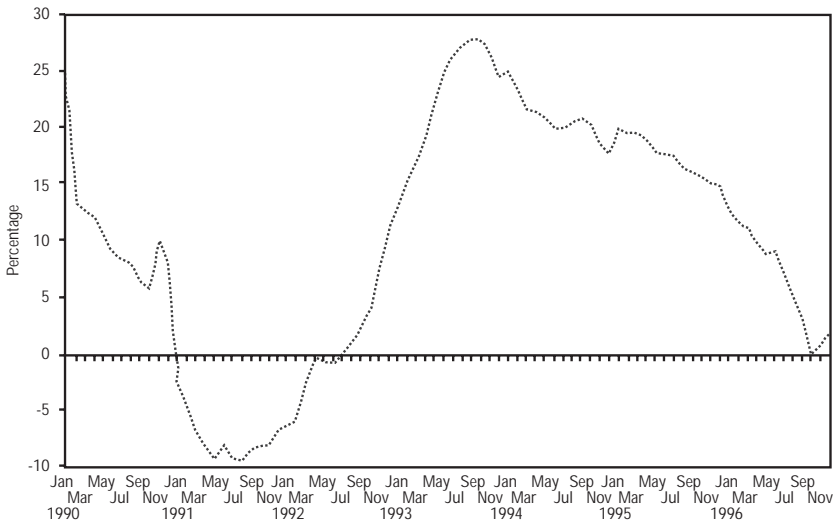
Source: Banco de la Republica.

Figure 6.3. Exchange Rates and International Reserves

a. Nominal Devaluation

b. Real Exchange Rate

c. International Reserves

Source: Banco de la Republica.

Phase III: A consensus built rapidly during *Phase II* on the snowball effects of massive sterilisation of foreign exchange reserves; indeed, according to some authors, the policy mix characteristic of this period precisely *maximised* the accumulation of foreign exchange reserves (Lora, 1991). Starting in September 1991, the newly independent central bank authorities accelerated exchange–rate appreciation as they adopted significant changes in monetary policy. In October, they increased the redemption period for foreign exchange certificates to one year and raised the discount for immediate redemption to 12.5 per cent. As the minimum discount over the following months was 5.5 per cent, some authors have claimed that the system became equivalent to an exchange–rate band with a mid–point at a 9 per cent discount on the price of

mature foreign exchange certificates and a maximum fluctuation of 3.5 per cent on each side of the mid–point; but this system had important differences from the explicit exchange rate bands adopted in 1994, as the reader will see below.

The 100 per cent marginal reserve requirements were eliminated in September 1991. Simultaneously, interest rates on open market operations were cut radically; by early 1992, they had become negative in real terms, producing a sharp reduction in all market interest rates. To induce this reduction, a cap on domestic lending rates was temporarily set between May and December 1992. Reserve requirements on term deposits came down in 1992 and 1993. All monetary and credit aggregates boomed. An initial argument held that the endogeneity of the money supply and increased domestic demand for monetary and financial assets made interest rates rather than monetary aggregates the main targets of monetary policy. A gradual shift to a less expansionary monetary policy became evident through 1993 in the evolution of interest rates. Nonetheless, monetary and credit aggregates continued to boom: by the third quarter of 1993, the annual growth of real domestic credit peaked at 27 per cent. The rules for borrowing in foreign currencies also eased, particularly in September 1993.

Simultaneously, the rapid increase in government revenues, enhanced by a new tax reform in 1992, translated into one of the most rapid expansions of public sector expenditure in Colombian history. Overall fiscal balances nonetheless remained under control. Expansionary monetary and fiscal policies were rapidly reflected in a spectacular boom in aggregate domestic demand, which increased in real terms by 10 per cent in 1992 and 12 per cent in 1993. Led by the non–tradable sectors, GDP growth picked up, reaching 5.4 per cent in 1993. In the very open trade regime, however, the increase in domestic demand brought an even more rapid increase in imports. On the other hand, due to exchange rate appreciation and despite the positive effects of integration agreements on intraregional sales, the export boom which had started in the mid–1980s came to an end in 1991, as the ratio of exports to GDP indicates. Both factors induced a sharp turnaround in the current account. By 1993, the rapid accumulation of international reserves ceased. The effect of real exchange rate appreciation on the domestic price of tradables — particularly agricultural prices in 1993 — produced a gradual reduction of inflation, but "core" (non–food) inflation tended to accelerate through 1993.

Phase IV: By late 1993, the central bank had become increasingly worried by the rapid increase in monetary aggregates, domestic demand and inflation. This set the stage for a return to a more restrictive monetary policy, but the initial preoccupation of the authorities concerned how to regain monetary control under the conditions of an open economy. This led to the decision, in January 1994, to establish a system of foreign exchange rate bands. Flexibility within the band was seen as essential to recapture control over monetary aggregates (Urrutia, 1995). The central point of the band was set at the market discount on foreign exchange certificates at the time (11.6 per cent), with the margin for fluctuations at 7 per cent on each side, twice that which prevailed under the implicit bands of the previous system. Two important differences characterised the new system. First, the central bank could intervene within the band to stabilise the exchange rate in the face of very sharp short–term fluctuations; these interventions,

fairly common since the introduction of the foreign exchange band, made it a system of dirty floating[2]. Second, despite assertions that the band was pre–announced for only ten days, the public has since then generally understood statements by the central bank and the government on macroeconomic targets for the year as pre–announcements of the annual devaluations of the band; this represented a radical change in foreign exchange policy, as exchange rates had never been pre–announced in Colombia since establishment of the crawling peg in 1967. Although the centre of the band was revalued by close to 3 per cent, under the pressure of rising interest rates (see below), the exchange rate soon reached and remained close to its floor. The band was explicitly revalued by 7 per cent in mid–December 1994.

Revaluation and exchange rate flexibility combined with a return to more active monetary and credit management. Credit ceilings established between March and July 1994 were generally seen as a failure. In the second quarter of the year, interest rates started to increase sharply; by the end of the year they exceeded by a considerable margin those typical in 1991. Monetary and credit aggregates slowed down, although initially very slowly, no doubt reflecting buoyant demand. Restrictions on borrowing foreign currency increased in March and particularly in August 1994, when the new Administration pressed *Banco de la República* for them as a central element of a policy package aimed at putting an end to the real appreciation of the peso.

Expansionary fiscal policy continued. Although its mix with a contractionary monetary policy, characteristic of this phase, brought some reduction in the growth of aggregate demand, it continued to increase at very high rates in 1994 (close to 10 per cent in real terms). This led to a boom in the non–tradable sectors which increased GDP growth to 5.7 per cent but, again, most of the increase in aggregate demand and real exchange rate appreciation were reflected in a continuous deterioration in the current account of the balance of payments. Core inflation regained its downward trend, although rising agricultural prices prevented overall inflation from decreasing in 1994. To fight the very important inertial elements of Colombian inflation, the Samper Administration negotiated a tripartite incomes policy (*Pacto Social de Productividad, Precios y Salarios*) in December 1994.

Phase V: By the second quarter of 1995, it became clear that high interest rates had started to affect aggregate demand. The long construction boom which started in 1992 was over; gradually, high interest rates also affected other components of private domestic demand. This led the Administration to negotiate a more balanced fiscal–monetary policy mix with *Banco de la República*. As a result of the agreement, interest rates again became subject to temporary controls, in June–August 1995. Reserve requirements on sight deposits were reduced marginally in July but increased for term deposits in December, along with a reduction for public sector deposits. Real interest rates came down during most of the second semester but increased again in December and remained high through the first semester of 1996.

A new wave of controversies characterised the early part of 1996, as high interest rates coincided with a sharp reduction in the growth of domestic credit, a situation further complicated by discussions of the effects of the domestic political crisis on economic activity. New agreements between the government and the central bank led to some liberalisation of foreign currency borrowing in February and March and several reductions in bank reserve requirements throughout the year, particularly for sight deposits. The central government further reduced the growth of public expenditure directly under its control, but legally decreed transfers to the regions and the social security system, rising interest payments on domestic debt and a reduction in tax revenues due to the slowdown in GDP growth led to a significant deterioration of the central government deficit in 1996. This forced the design of a fiscal austerity programme for 1997 (Ministerio de Hacienda y Crédito Público, 1996).

Aggregate demand slowed in 1995 and especially in 1996. This had marginal effects on economic growth in 1995, when GDP increased 5.2 per cent, but stronger ones in 1996, when GDP growth dropped to 2.1 per cent and demand–sensitive sectors stagnated or contracted. Inflation behaved inversely; it declined in 1995 but increased in 1996 despite weak domestic demand[3]. On the other hand, a turnaround of the balance of payments reflected the slower growth in aggregate demand. In 1996 the trade deficit decreased as a proportion of GDP. Improvements in the external balances reflect both increased exports (minerals in both years, as well as non–traditional and coffee exports in 1995), and the end of the import boom that followed trade liberalisation.

Growing imbalances in the growth of aggregate supply and demand, and their reflection in the external accounts, which characterised the 1992–94 upswing, were thus eliminated in 1995–96. This, together with higher oil revenues and the gradual (no doubt, difficult) build–up of a consensus between the government and the central bank on the appropriate fiscal–monetary policy mix, should allow the return to faster economic growth.

Overall, the 1990s have seen sharp stop–go cycles, associated in particular with swings in monetary policy. Perhaps paradoxically, central bank independence has reflected itself in more pro–cyclical monetary management than was typical in the past, and it led to one of the most spectacular booms in aggregate demand in Colombian economic history. Obviously, the increase in public sector expenditure also fuelled the demand boom; by international standards it was a paradoxical companion to the structural reforms. The joint effects of real exchange rate appreciation and trade liberalisation with its consequent import boom resulted in a sharp deterioration in the balance of payments, recently reversed by contractionary demand policies. Contrary to simplistic analyses of the link between trade liberalisation and export dynamics, a stagnation of the export ratio in 1991–95 (see Table 6.2) followed the sharp increase of exports as a proportion of GDP which had characterised the protectionist trade régime of the second half of the 1980s. This clearly indicates that the real exchange rate has certainly had more importance than bias or neutrality of the trade regime as a determinant of Colombian exports.

Trends and Determinants of Capital Flows

Controversies

As a result of the sharp turnaround of the balance of payments, the role of capital flows has changed considerably in the 1990s. Controversies in the early part of the decade related to the effects of exchange rate undervaluation and current account surpluses, with capital flows seen as a major nuisance. A central issue was whether high domestic–external interest rate differentials and massive sterilisation of international reserve accumulation could be maintained, particularly in the face of strong expectations of exchange rate appreciation. An element of this discussion was whether foreign exchange controls were an effective mechanism to counteract those incentives for capital inflows.

As the decade progressed, this discussion did not disappear. Indeed, the new administration argued strongly in August 1994 that controls on capital flows were essential to counteract the expectations of exchange rate appreciation. The Mexican crisis, however — and political events, later on — effectively changed expectations, bringing back a consensus on the need to monitor exchange rate revaluation and current–account deficits closely, issues which the new Administration had struggled to get back into domestic discussion against the views of more orthodox observers. This issue relates closely to that concerning the adverse trends of private saving which accompanied the turnaround of the balance of payments, a question which had also been absent from domestic discussions during the 1992–94 demand boom; the new administration brought it as well to the forefront of domestic macroeconomic debates.

Through 1995 and most of 1996, the central issue concerned the sustainability of existing current account deficits and thus the relation between such deficits and available external financing. A fairly general consensus exists on the favourable effects of capital controls on the *structure* of external financing (the large proportion of long–term financing), which makes Colombia resilient against speculative attacks of the type faced by Mexico and Argentina. A similar consensus prevails that existing current account deficits are sustainable, but that the expected increase in oil revenues should be used gradually to reduce them in the future. Renewed appreciation trends in the second semester of 1996, again associated with capital inflows, have brought back to the forefront of domestic discussions the fear that such flows, on top of increased oil revenues, could generate "Dutch disease" effects that would hit the tradable sectors and counteract expected improvement in the trade and current accounts.

A parallel controversy, very active since 1992, relates to the possibility of using capital flows as a mechanism to generate more competition in the financial market by forcing reductions of the high interest rate margins of domestic financial intermediaries. Some preliminary evidence indicates no sign that freer access to world capital market reduces domestic financial margins[4]. We do not deal with this issue, but rather concentrate on the links between interest rate differentials, controls and capital flows. The third section explores the role of external financing in the saving–investment process.

Regulations

An important liberalisation of foreign exchange transactions occurred in Colombia in the 1990s along with a fairly complete liberalisation of foreign direct investment (FDI)[5], but significant controls on short–term capital flows remain. The liberalisation of foreign exchange regulations took place in two stages. The first came with Law 9 of 1991 and its related Resolution 57, issued in June 1991 by the Monetary Board. Both made major changes in the control system of Decree 444 of 1967, which had regulated foreign exchange transactions in Colombia for a quarter of a century. The major innovation decentralised foreign exchange transactions: financial intermediaries could manage them without prior controls by the central bank; the reform also allowed a fairly general use of bank accounts abroad to manage foreign exchange revenues and expenditures of firms. Most transactions continued highly regulated, however, including, with few exceptions, the obligation to channel them through intermediaries legally allowed to operate in the market. For capital transactions, the change established a minimum maturity of one year for foreign loans, except for some commercial credits; but it maintained strong regulations on the final use of external lending (investment, exports and imports) and some sectoral discrimination. In all these respects, the 1991 regulations preserved great continuity with those of 1967. The major departure was probably Resolution 7, issued by the independent central bank board in February 1992; for the first time it allowed firms to contract abroad credits for short–term working capital.

The second stage stemmed from the central bank board's Resolution 21 of September 1993. It made a more important change with respect to capital transactions: it transformed a system of regulations of capital flows based on their *final use* into a system based on their *maturity*. Most importantly, domestic financial intermediaries could for the first time lend in foreign currency to domestic firms and residents with no regard for the final use of those credits. An accompanying change extended the requirement that all debts in foreign currency must be registered at *Banco de la República*, which did not exist prior to that date for short–term commercial debts. Resolution 21 also allowed domestic financial intermediaries to lend to foreigners in international currencies and to invest abroad in liquid assets.

More generally, four different types of restrictions have affected capital flows in the 1990s:

1) Direct restrictions on foreign currency borrowing. As noted, until September 1993, both the domestic use of foreign loans and their minimum maturity were regulated. Since then, a price–based control system has been in place, based on deposits in the central bank required for all loans of less than a certain "minimum maturity". This deposit resembles a reserve requirement, an interest equalisation tax or a Tobin tax; that the deposit can be immediately redeemed at pre–established discount rates highlights the last interpretation. Minimum maturities and deposit requirements have varied over time.

In September 1993, a one–year, 47 per cent dollar deposit was established for loans with maturities of less than 18 months[6]. In March 1994, the minimum maturity increased to three years, with three deposit alternatives for loans with less than the minimum maturity: 93 per cent for a year, 64 per cent for two years or 50 per cent for three years. In August 1994, the minimum maturity went to five years, the maturity of the deposit became equal to that of the loan and a complex table based on loan maturities governed deposits — from a maximum of 140 per cent for 30–day loans to a minimum of 42.8 per cent for those with maturities of just less than five years. In February 1996 the minimum maturity was reduced to four years with a new, simpler table. In March 1996 the minimum maturity dropped to three years with a unique 18–month deposit of 50 per cent, independent of the maturity of the loan. In March 1997 the minimum period rose again to five years. Minimum maturities finally were eliminated in May with a unique 30 per cent, 18–month peso deposit established for all loans.

As one can appreciate, under the price–based deposit system, incentives to borrow in foreign currencies depend on both the differential between the domestic and the external interest rate (*cum* expected devaluation) and the opportunity costs of the deposits. As shown in the Appendix, the tax equivalent of the deposits depends on three factors: *a)* the deposit rate; *b)* the relation between the maturity of the loan and that of the deposit; and since deposits were dollar–denominated from September 1993 to May 1997, their opportunity cost, which increased (decreased) if domestic interest rates rose (fell) or if the rate of devaluation decreased (increased). Note that the last effect runs contrary to the direct effect of devaluation on the costs of foreign borrowing. In this sense, the tax has a (partial) stabilising effect on the costs of foreign borrowing: it increases when the direct costs of such borrowing drop due to a slow rate of devaluation, but has the opposite effect when devaluation accelerates.

Figure 6.4.a shows the total costs of loans with maturities of 6, 12, 18, 24 and 36 months, compared to the typical 90–day deposit rate. Figure 6.4.b shows the tax equivalent of deposits for the same maturities. Regulations clearly did not have much restrictive effect prior to August 1994, except for short-term debts (six and 12 months). Afterwards, up to February 1996, the relative cost of borrowing in foreign currency increased significantly for all maturities, which the acceleration of devaluation in the second semester of 1995 reinforced. Nonetheless, as noted, the tax equivalent of deposits actually declines when devaluation accelerates. The new rules established in February and March 1996 reduced the relative costs of borrowing in external markets but kept them high for short term maturities.

2) Restrictions on commercial debts. These regulations accompany rules on import payments and export prefinancing. In December 1990, they required that imports be paid for within three months of the freely determined credit period established at the time of import registration; this equated to prohibiting the rollover of outstanding commercial debts. In June 1991, a six–month maximum payment period established for imports of consumer and intermediate goods set a maximum maturity for the related commercial debts. This period dropped to four months in August 1994 and increased again to six months in February 1996.

Figure 6.4. **Cost of Foreign Borrowing within an Obligatory Savings System**

a. Effects of Forced Deposits on the Relative Cost of External Borrowing
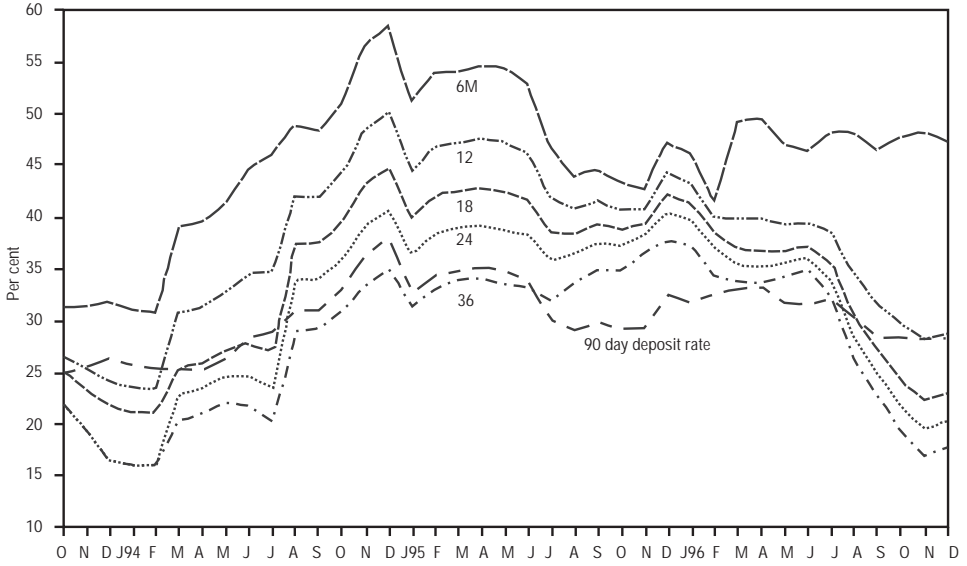
b. Tax Equivalent of Deposits

Definitions: See text.

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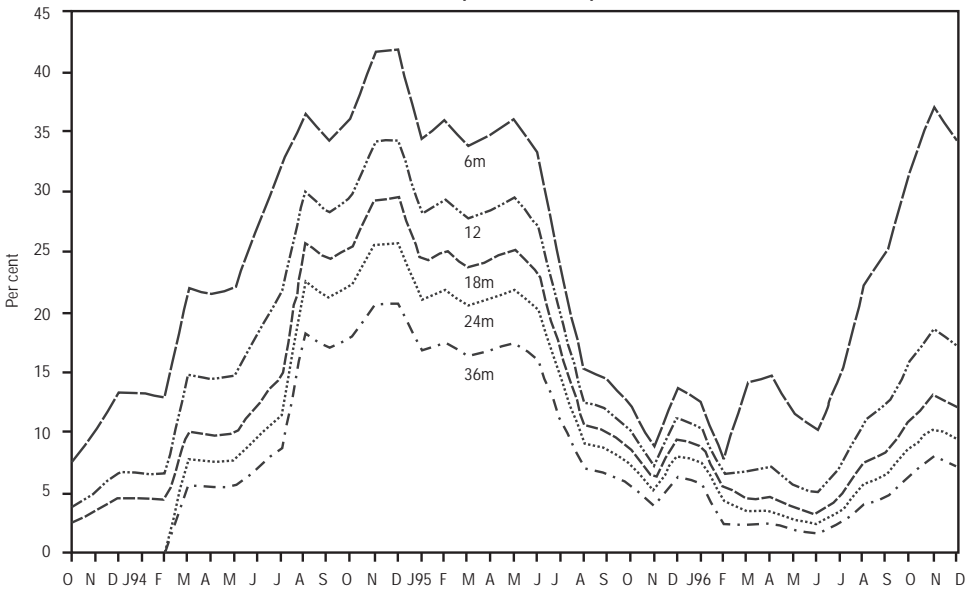
Resolution 57 of 1991 allowed three–month prefinancing for most exports (one year for capital goods). Resolution 21 of 1993 subjected all exports to the general rules on foreign– currency debts, with an exception: loans within a special quota of $350 million for loans from the Foreign Trade Bank (Bancoldex), with a maximum maturity of six months, did not require deposits. This quota increased to $450 million in September 1994 and the maturity of the related loans went to one year; the quota rose further to $500 million in April 1995 and to $550 million in September 1995. Moreover, in February and March 1996, exporters received special preference with respect to deposits on other loans in foreign currencies — 15 per cent as against 50 per cent for others.

Special regulations for coffee have existed throughout the decade. Special quotas for coffee export prefinancing of $100 million for the Coffee Growers Federation and $100 million for private exporters were established in 1991. Credits contracted under these quotas escaped the deposit requirement for foreign loans established in September 1993. In July 1994, private exporters obtained the use of half the Federation quota if it was not used by that institution. In December 1995 the Federation quota rose temporarily to $150 million.

3) Controls on net foreign exchange assets of financial intermediaries (posición propia). A ban on negative net foreign exchange asset positions for intermediaries effectively prohibits them from using external funds to lend in *pesos*. On the other hand, forcing them to hold positive net foreign assets in periods of expected real appreciation of the *peso* increases the costs of intermediating foreign exchange loans and the demand for foreign exchange. This instrument has been actively used in the 1990s. A determination in October 1991 required domestic financial intermediaries to hold minimum net foreign assets equivalent to 30 per cent of their liabilities in foreign currencies. This requirement increased to 45 per cent in March 1992, but fell to 40 per cent in June 1993 and to 30 per cent in October 1995; it disappeared in November 1995. To increase the costs of intermediating external credit lines, a 5 per cent marginal reserve requirement on the external liabilities of financial intermediaries was established in September 1994[7].

Whereas forcing intermediaries to hold net foreign exchange assets is a good idea in periods of excess supply of foreign exchange, it may become a source of speculation under different conditions; this became evident in the short speculative wave of August 1995[8]. The requirement thus was eliminated shortly after and restrictions on daily variations of such net assets were established in September 1995. Restrictions on maximum net foreign assets can also be used for that purpose (although they have not); they are established as a proportion of "technical net worth" (i.e., net worth weighted by riskiness of the assets).

4) Complementary regulations may also have effects on capital flows. Most important are those on the domestic assets of foreign investment funds, which have been allowed to operate in Colombia since 1992. To control interest arbitrage which

may be filtered through service transactions and illegal flows of funds, various policies have been adopted at different times: discounts on sales of cash to the central bank established in April 1991; a withholding income tax of 3 per cent on service income, set at the same date, increased to 10 per cent in July 1992 and reduced again to 3 per cent in January 1996; and temporary controls on tourist income receipts established in 1992.

The Magnitude and Determinants of Capital Flows

Table 6.3 and Figure 6.5 summarise the evolution of external financing and the foreign debt of Colombia. The Figure 6.5 has four noticeable features. *First*, financing requirements in the 1990s, as measured by the current account deficit as a proportion of GDP (estimated at parity exchange rates, taking 1994 as the base year) are significantly smaller than those typical of the early 1980s. *Second,* FDI has become a major, stable source of financing, covering in recent years about half of the total financing requirements. The boom in oil investments tells part of the story, but equally important is the spurt of FDI in non–tradable activities, primarily those liberalised in the early 1990s (domestic commerce, public utilities, domestic financing, etc.) *Third,* net short-term capital flows have played a secondary role; indeed, in some years, they have turned negative. Thus, , for practical purposes, long-term funds, including FDI, basically have financed the current account deficit.

As Table 6.3 indicates, the decline of the moderate debt ratios characteristic of the second half of the 1980s continued in the early 1990s. Since then, they have tended to stabilise. Private and public foreign debts evolved very differently, however. Indeed, the nominal increase in the external debt of Colombia throughout the decade, particularly in 1992–94, has accompanied private sector borrowing. Whereas public sector debt ratios have declined throughout the decade, those of the private sector have increased and now exceed those reached in 1986, at the end of the debt boom which had started in the late 1970s.

Important changes also have occurred in the composition of both private and public foreign debt. For the private sector, long-term external liabilities have increased fastest, notwithstanding an important increase in short-term debts, half of which took place in 1993. In the public sector, long-term liabilities have dominated throughout the decade. The rise of bond financing and the relative decline of bilateral debt have constituted the major change; among multilateral lenders, the Interamerican Development Bank has replaced the World Bank as the major source of financing.

The importance of private capital flows has made them the focus of major attention in the 1990s. As most of the literature covers periods under which exchange controls prevailed, a central issue in the discussion has involved the extent to which interest arbitrage has filtered through the service or trade accounts. Different authors have designed proxies for private capital flows, any of which may be subject to dispute. Alternatively, the link between domestic and foreign interest rates *cum* expected devaluation has been directly tested.

Table 6.3. **Colombia: External Debt**

($ million)

	1978	1986	1990	1991	1992	1993	1994	1995	1996
Private debt	1 584	3 318	3 027	2 532	3 256	5 056	7 589	9 927	11 940
Short term	1 221	1 711	1 914	1 551	2 006	3 009	3 684	4 374	4 525
Long term	363	1 607	1 113	981	1 250	2 046	3 905	5 553	7 416
Public Sector Debt	2 896	12 463	14 586	14 464	13 487	13 529	13 568	13 952	15 554
Multilateral	1 108	4 596	6 021	6 174	5 886	5 728	5 519	5 649	5 399
Bilateral	992	2 357	2 707	2 571	2 165	1 803	1 654	1 747	1 801
Commercial Banks	523	4 865	4 719	4 536	4 304	4 293	4 689	4 307	4 397
Bonds	45	46	275	359	419	776	1 083	1 733	3 450
Suppliers	228	599	864	824	713	659	623	516	507
Total	4 480	15 781	17 613	16 996	16 743	18 315	21 157	23 879	27 494
Debt as a percentage of exports									
of goods and services	139.2	296.0	248.8	226.4	230.5	246.6	253.9	233.5	254.4
Private	49.2	62.2	42.8	33.7	44.8	68.1	91.1	97.1	110.5
Public	90.0	233.8	206.0	192.6	185.7	178.5	162.8	136.4	143.9
Debt as a percentage of GDP									
at 1994 parity exchange rates	24.7	45.7	37.7	35.5	31.8	30.7	31.0	29.8	31.6
Private	8.7	9.6	6.5	5.3	6.2	8.5	11.1	12.4	13.7
Public	16.0	36.1	31.2	30.2	25.6	22.2	19.9	17.4	17.9

Source: Banco de la Republica.

Figure 6.5. **External Financing and External Debt**

a. **Sources of External Financing** (percentage of GDP at 1994 parity exchange rates)

Direct foreign investment ◻ Long term debt ◼ Short term debt ◻ Current account -----

b. **Foreign Direct Investment**

◼ Non oil ◻ Oil ----- Total as percentage of GDP
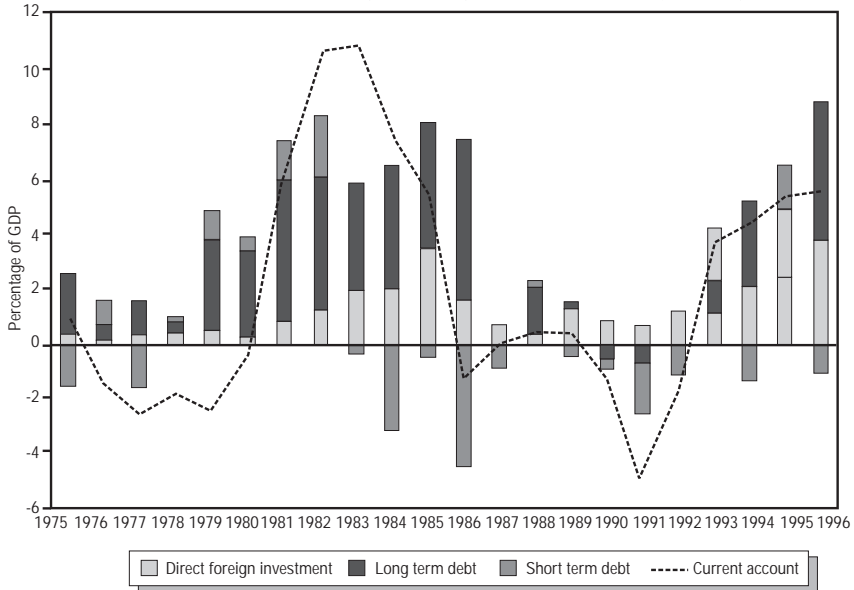
Sources: Banco de la Republica and DANE.

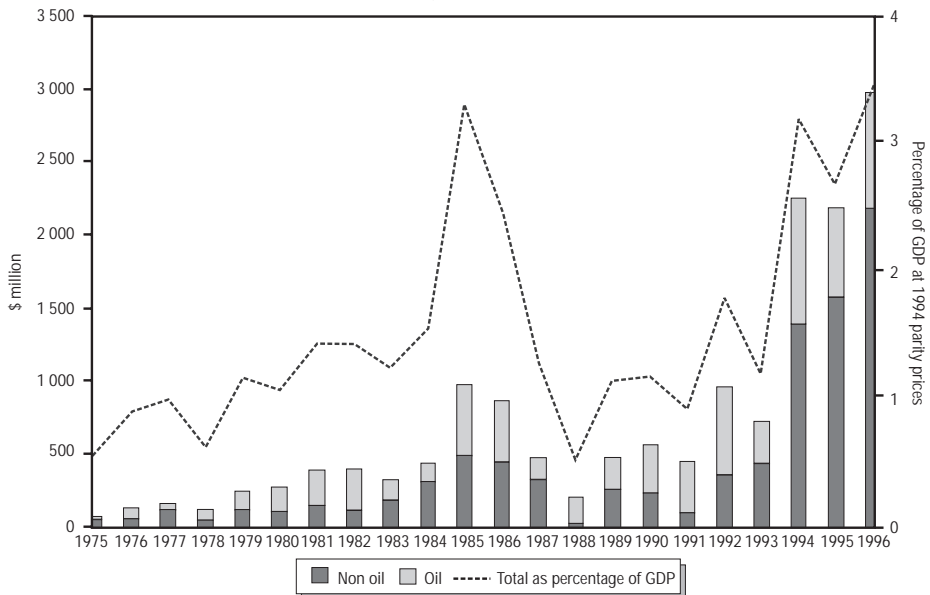Generally, all authors have found evidence of interest arbitrage and sensitivity of capital flows to interest rate differentials. As suggested by Steiner *et al.* (1993), a possible explanation for the link between domestic and world interest rates *cum* devaluation may be that economic authorities have acted as if it exists as a rule. Some studies have found the potential capital gains associated with major exchange rate misalignment (either under or overvaluation) to be a more important determinant of capital flows than simple interest rate differentials (see Herrera, 1993, and Steiner *et al.*, 1993). O'Byrne and Reina (1993) have disputed the causal link implicit in most explanations of capital flows, claiming that it runs from capital flows to interest rate differentials (including expected devaluation) rather than the contrary. The relation of drug money to capital flows has also been subject to some dispute (see O'Byrne and Reina, 1993, and Urrutia and Pontón, 1993, for opposite views).

A recent analysis of the price–based capital controls (Cárdenas and Barrera, 1997), using monthly data for 1985 to mid–1996, indicates that they have been effective in changing the composition of capital inflows for long-term maturities but casts doubts on their effectiveness in reducing capital flows in absolute terms. They base these doubts on three different statistical results: flows do not depend on interest rate differentials when those differentials are estimated using the tax equivalent for shorter–term deposits (18 and 24 months); clear signs of speculative behaviour prior to and after policy decisions are adopted, reflected in an unexpected increase in inflows captured by specific dummy variables; and the lack of any permanent effect of control measures, as reflected in the lack of significance of the coefficients for dummy variables which cover the whole periods for which specific control measures were in place. The exception to the last is a dummy which covers January 1995–June 1996, which the authors interpret as a "Tequila effect". Some of these results may support a different interpretation, as the reader will see below.

The analysis will look at the determinants of three different components of private capital flows: *a)* cash capital flows, as measured by the balance of cash foreign exchange flows (*balanza cambiaria*); *b)* commercial capital flows, as measured by the difference between import financing and net financing to buyers of Colombian exports abroad, the first measured by the difference between non–oil imports and import payments, the second by the difference between exports and export cash proceeds; and *c)* those "filtered" through the non–financial service accounts of *balanza cambiaria*. In the third case the analysis follows the procedure originally used by Correa (1984), in which interest rate differentials are used as a determinant of capital flows together with other "fundamental" determinants of the service account (domestic activity variables, the real exchange rate and the ratio of the official to the black market exchange rate, to capture foreign exchange arbitrage between the black and the official markets). Cárdenas and Barrera (1994) used a different procedure, first correlating the service account to the activity variables and using the residuals as a proxy for capital flows, which were then explained by interest rate differentials and the black market premium.

Using this methodology to analyse quarterly data for 1978–92, Cárdenas and Barrera (1994) found evidence of interest arbitrage in the cash capital flows and the residuals of the service account, but not in the case of commercial capital flows. Cárdenas and Barrera (1997) obtained a similar result for cash capital flows, but only when including the costs of deposits for medium- and long–term loans in the regressions, as well as for a global measure of capital flows, which includes cash flows, transfers and the temporary component of the non–financial services balance. In contrast, using the alternative methodology suggested here to analyse the service account, Correa (1984) did not find evidence of interest arbitrage in any of the service accounts in 1974–83, which would indicate no support for the hypothesis that they were used to hide arbitrage flows during the classical period of capital controls.

The following relations are estimated:

$K1 = K1(MK, dif)$

$K2 = K2(MK, dif)$

$NFS = NFS(Y, e, prem, dif)$

where $K1$ and $K2$ are cash and commercial capital flows, and NFS is the non–financial service balance in the cash foreign exchange accounts; imports of capital goods *(MK)* are assumed to constitute the main activity variable determining $K1$ and $K2$[9], whereas seasonally adjusted non–coffee industrial production is used as the activity variable in the equation determining the service account; e is the real exchange rate, as measured by *Banco de la República*; and *prem* is the ratio of the official to the black market exchange rate. Finally, *dif* is the interest–rate differential. In the absence of deposits:

$$dif = \{(1+i)/[(1+i^*)(1+de)]\} - 1$$

where i is the domestic deposit rate, i^* the US deposit rate and de the expected nominal devaluation; for simplicity, assume that expected devaluation equals the annualised devaluation of the past 12 months (estimates using quarterly devaluation were similar but somewhat less satisfactory, whereas those using monthly devaluation were inadequate). When deposits are in place, the interest rate differential includes the total costs of deposits (z):

$$dif(z) = \{(1+i)/(1+z)\} - 1$$

The precise expression for z is derived in the Appendix. The values of z for credits with maturities of 18 and 36 months are used in the regressions. Since deposits are always relevant for K1, *dif(z)* is used after September 1993 as a determinant of this type of flows. On the contrary, they are not relevant for *NFS*, which is thus assumed to depend only on the simple interest rate differential, *dif.* Commercial capital flows hold a mixed position, since some import and export credits are not subject to deposits; thus, both *dif* and *dif(z)* are tried as determinants of *K2*.

To test the effects of changing regulations on capital flows, assume first of all that the effects of interest rate differentials on all sorts of flows differed prior to and after September 1993, when Resolution 21 introduced the price–based capital controls. Following Cárdenas and Barrera (1997), an attempt will be made to test for the *temporary* effects of crucial policy decisions, using dummy variables which assume that the impact lasts four months. The interpretation of these effects depends on whether the decisions liberalised the capital account (February 1992, September 1993 and February–March 1996) or increased controls (March and August 1994). In the first case, a positive coefficient could represent a stock adjustment induced by the liberalisation measure, whereas in the second case it should reflect speculation against controls. Attempts to test the long-term liberalisation effects of Resolution 7 of February 1992 or Resolution 21 of September 1993 were unsuccessful.

Finally, an additional dummy captures the restrictive regulations of the August 1994–February 1996 period. There were significant debt registrations in the weeks prior to the introduction of the August 1994 regulations, however, (Banco de la República, 1995), associated with expectations that the incoming Administration would propose increased controls on capital flows to the central bank. These registrations reduced the effects of controls for some four months after the regulations were introduced. A temporary dummy captures this speculative effect, as noted in the previous paragraph. Thus, the actual dummy variable used to catch the effects of the August 1994 regulations starts only in January 1995. This dummy, which covers December 1995–January 1996, resembles that used by Cárdenas and Barrera (1997) to measure the "Tequila effect", which, according to their statistical results, had a negative effect on capital flows. The alternative interpretation used here, that the dummy should reflect the effects of controls, is warranted because alternative evidence (premiums on Colombian bonds in international markets) suggests that the Tequila effect itself was weak in Colombia.

Figure 6.6 presents the basic data for interest rate differentials and private cash capital flows. Figure 6.6.a indicates the presence of major incentives for interest arbitrage from the second quarter of 1991 through mid–1992, from the third quarter of 1993 through the second quarter of 1995, and in the second semester of 1996. Yet the deposit system quite effectively reduced incentives to borrow in foreign currencies after March 1994 and eliminated them altogether after introduction of the August 1994 regulations. Global incentives to borrow abroad actually turned negative when devaluation accelerated in the third quarter of 1995. The joint effect of regulations and faster devaluation (and, maybe, a partial "Tequila effect") explains the sharp interruption of cash capital flows in 1995. Liberalisation of controls in February–March 1996, together with revaluation, led to a new wave of capital inflows in the second semester of 1996. Commercial capital flows and the balance of non–financial service accounts (not shown) have a very different pattern, apparently unrelated to interest rate differentials.

Figure 6.6 **Interest Rate Differentials and Capital Flows**

a. Interest Rate Differentials
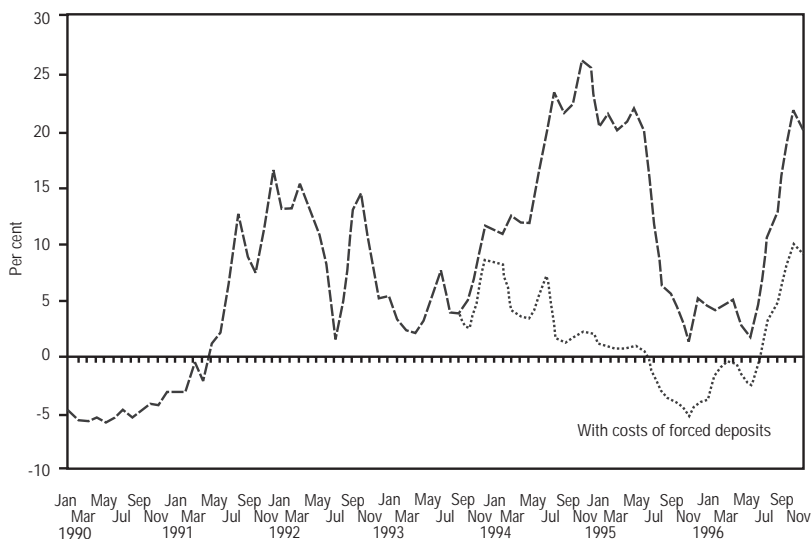
b. Cash Capital Flows

Definitions: See text.

Table 6.4 summarises the econometric results, using monthly data for 1990–95. The effective costs of borrowing at maturities of 18 and 36 months are used alternatively in the regressions for cash capital flows. Using the longer–term data, the results indicate strong evidence of sensitivity of private cash capital flows to interest rate differentials after September 1993, with the coefficient positive and statistically significant prior to that date as well. Using the shorter–term cost of borrowing, the coefficient is

Table 6.4. **Short-term Determinants of Capital Flows, January 1990-June 1996**

t-statistics

OLS Estimates	Cash Capital Flows			Commercial Capital Flows	Non-Financial Service Balance		Mean Value of Independent Variable
Constant	-50.7 (-2.75)	-67.0 (-3.42)	-81.3 (-2.90)	-39.8 (-0.77)	-428.0 (3.32)	464.1 (4.23)	
Imports of capital goods	0.427 (4.54)	0.483 (6.31)	0.538 (5.31)	0.448 (2.77)			271.8
Industrial production					-3.366 (-2.82)	-3.755 (-3.71)	109.4
Black market premium					756.9 (2.19)	808.8 (2.41)	0.030
Interest rate differentials (18 months credits)							
January 1990 - September 1993			233.7 (1.31)				0.020
October 1993 - December 1995			463.1 (0.70)				-0.013
Interest rate differentials (36 months credits)							
January 1990 - September 1993	276.0 (2.13)	261.3 (2.04)			223.4 (1.44)	247.2 (1.67)	0.020
October 1993 - December 1995	1 131.9 (3.16)	1 302.3 (4.51)					0.004
Dummies							
March 1992 - June 1992	42.0 (1.32)	43.5 (1.38)	51.3 (1.27)				
October 1993 - January 1994	46.4 (1.22)		74.0 (1.70)	18.5 (0.23)	-28.2 (-0.88)		
April 1994 - July 1994	33.6 (0.97)				-55.9 (-1.88)		
September 1994 - December 1994	159.7 (4.50)	140.7 (4.41)	150.8 (3.36)		-2.5 (-0.08)		
January 1995 - January 1996	-43.3 (11.54)	-55.1 (-2.31)	-76.5 (-1.86)				
February 1996- June 1996	20.7 (0.59)				-10.5 (-0.31)		
First - order autocorrelation					0.452 (4.01)	0.387 (3.54)	
R^2	0.69	0.69	0.66	0.29	0.58	0.56	
DW	1.78	1.73	1.98	1.97	1.98	1.97	
Memo: Mean value of dependent variable	76.4	76.4	76.4	90.3	83.1	83.1	

positive but not statistically significant after September 1993. This gives a sign that price–based capital controls actually turned the costs of short–term credits prohibitive (see Figure 6.4)[10]. No evidence appears of statistically significant interest–rate arbitrage for commercial capital flows and the non–financial service account. Actually, a wrong sign came out in the estimates for that variable for the post–September 1993 period using the two definitions of the interest rate differentials; these negative coefficients are not shown in Table 6.4. A positive coefficient for the interest rate differentials appears only for non–financial services prior to September 1993.

Table 6.5 presents, for representative phases in the period's history of capital controls, the estimated effects of interest–rate differentials on capital flows and the net reduction of such differentials generated by the deposit system. In the absence of the deposits, cash capital flows would have boomed during the period of price–based capital controls: $127 million per month in October 1993–March 1994 and more than $200 million per month after March 1994. The costs of deposits reduced those flows to $79 million in October 1993–March 1994 and $55 million in April 1994–August 1994, and turned them slightly negative in the period following the drastic August 1994 regulations.

The tests for the temporary effects of different policy decisions indicate important stock adjustments following the February 1992 and the September 1993 liberalisations. They also indicate a strong speculative wave following the August 1994 decision (additional inflows of $151 million per month) which had generated record registrations prior to the control measures. The August 1994 decision also had a lagged direct effect which reduced capital inflows by $77 million a month. Since this effect lasted longer than the initial speculative wave, its net result reduced capital flows by $391 million during the 17 months included in the regression analysis.

The effects of these dummy variables are not very significant for commercial flows and non–financial services. In the latter case, the expected sign was the opposite of that for direct capital flows, on the assumption that this account is used to hide capital flows. Thus no evidence appears that the September 1993 liberalisation reduced hidden transactions, or that the August 1994 controls increased such flows.

Finally, activity variables emerged as the major determinants of commercial capital flows and the non–financial services balance. Exchange rate arbitrage also served as a determinant of the non–financial service account. In contrast, this account is not very sensitive to the real exchange rate (this variable actually has the wrong sign in the estimations, and it is thus excluded from the results shown in Table 6.4).

These results confirm that Resolution 21 effectively liberalised the capital account. Its main effect increased the sensitivity of cash capital flows to interest rate differentials. The price–based capital controls also effectively reduced the *amount* of capital inflows, both by making short–term borrowing prohibitive and by increasing the costs of longer–term credits. The strict August 1994 restrictions also had additional effects, with a lag. This probably reflects that the supply of lending decreased when regulations on the minimum maturity of loans became stricter, as the demand decreased due to the

Table 6.5. **Estimated Effects of Interest Rate Differentials over Cash Capital Flows**

Monthly average

	Jan. 1990- Feb.1992	Mar. 1992- Sep. 1993	Oct. 1993- Mar. 1994	Apr. 1994- Aug. 1994	Sep. 1994- Jan. 1996	Feb. 1996- June 1996
Interest Rate Differentials (percentages)						
Excluding deposits	1.1	7.0	9.8	16.4	15.2	3.5
Including deposits			6.1	4.2	-0.8	-1.3
Net effect of deposits			3.7	12.2	16.0	4.8
Estimated Effects of Interest Rates Differentials ($ million)						
Excluding deposits	2.9	18.3	127.2	213.5	197.9	45.6
Including deposits			79.4	55.3	-10.6	-16.8
Net effect of deposits			47.8	158.2	208.5	62.5

higher exchange rate risks involved in longer term loans. The results also indicate temporary stock adjustments following the February 1992 and September 1993 liberalisations, and strong speculative behaviour prior to the August 1994 restrictions.

Parallel evidence suggests that controls also have been effective in determining the *term structure* of private debts. Table 6.6 presents data on registrations of new debts contracted with foreign financial institutions in 1994–96. Maturities clearly increased as a result of the March and August 1994 regulations, which raised the minimum maturity for deposit–free loans from 18 months to three years and then from three to five years. The return to a three–year minimum maturity in March 1996 had the opposite effect. Most of the short–term debt (less than six months and some export financing in the 7–18 month range) relates to import and export financing which is either free from deposit requirements or has had smaller ones since March 1996.

Capital Flows, Savings and Investment

A Brief Survey of the Literature

The literature on the determinants of saving and investment in Colombia has been extensively surveyed by one of the authors in previous papers, which also include several econometric exercises on these determinants (Ocampo, 1989; Ocampo *et al.*, 1985 and Ocampo *et al.*, 1990). These papers serve as references to survey the Colombian literature prior to the 1990s, complemented by references to recent contributions to the analysis.

The literature on saving has shown the strong relation between saving and income distribution. It indicates that the government and public as well as private firms have a high propensity to save, with a low propensity to save labour income. In time series analysis, this appears in the positive association of private savings with the share of capital income. The evidence also shows a significant correlation between external variables and domestic savings: the terms of trade and the export ratio have positive effects, whereas external savings have negative effects on domestic savings. Detailed analysis of the latter effect indicates a strong substitution of both private and public sector domestic savings for external financing, which may indicate the liquidity constraints faced by domestic economic agents; for some (private firms), however, evidence appears of complementarity between saving and external financing in the 1970s and 1980s (Ocampo, 1988 and 1989; Ocampo *et al.*, 1990).

Whereas some authors have found support for the permanent income hypothesis, others have claimed a tendency, in fact, for the private sector to overconsume transitory income. No evidence appears for any interest–rate sensitivity of private savings but some does for the "forced savings" effects of inflation. Some evidence suggests adverse effects of taxation on private saving but positive effects on total saving due to the high propensity to save government revenues. There is no clear evidence of any "Ricardian" effect of fiscal deficits on private savings.

Recent contributions confirm the high concentration of household savings in the high deciles of the income distribution (Ramírez, 1992). López (1994) has presented a strong case against the rational expectations permanent income hypothesis, which he interprets as a confirmation of the liquidity constraints faced by private consumers. Whereas Ramírez (1992) confirms the absence of any positive link between private savings and interest rates, López *et al.* (1996*b*) get some evidence that household savings and real interest rates are correlated in the long run but not in the short run. López *et al.* (1996*b*) also find indications of precautionary household saving associated with the instability of labour income, plus weaker evidence of complementarity between public and private consumption and of the positive effect of lower demographic dependency ratios on household saving. They find, on the other hand, no direct evidence of the impact of financial liberalisation (as measured by the ratio of domestic credit to GDP) on household saving, but some effects through the greater liquidity of wealth generated by domestic credit availability.

Sánchez *et al.* (1996) show the strong substitution of saving by private firms for domestic and external financing (somewhat stronger for the latter). They also find very clear evidence that the domestic and external financial boom of the first half of the 1990s was largely responsible for the reduction of saving by private firms, particularly those which had been rationed in credit markets up to 1991. Overall, data presented by these authors indicate that easier access to domestic and external credit largely accounted for the fall in the ratio of savings by private firms to profits from 50 per cent in the 1980s to 20 per cent in 1994. The substitution of external for private domestic savings has also been confirmed by *Misión de Estudios del Mercado de Capitales* (1996) for 1970–94, which also finds substitution between private and public sector savings and positive effects of inflation on private saving.

López (1996) and López *et al.* (1996a) have estimated new savings data, which correct the national accounts series for capital gains. They find that the traditional series underestimates savings in the 1990s, as capital gains associated with real exchange–rate appreciation were substantial in the early part of the decade. They nonetheless confirm the significant reduction in private savings in 1988–93, which they ascribe to three factors: *a)* the fall in disposable income due to higher taxation; *b)* the significant reduction in savings by firms in the early 1990s, partly due (up to 1993) to the reduction in profits associated with trade liberalisation; and *c)* only secondarily, higher household consumption.

Carrasquilla and Rincón (1990) conclude that the strong version of Ricardian equivalence cannot be accepted, but that some weaker versions can. López (1994) has severely criticised this work. Gaviria (1993) has confirmed the positive link between the terms of trade and savings, and Echeverry (1996) that between exports and savings.

There is overwhelming support for the accelerator hypothesis[11] for private investment. Among the different components of user costs, strong evidence supports the effects of the relative price of capital goods on private investment, with indications that the corresponding elasticity has increased over time, but generally none supports the interest–rate sensitivity of investment. There is also weak support for the negative

Table 6.6. **Gross Registrations of Private Debts with Foreign Financial Institutions, by Maturities**
($ million and percentage of total registrations)

		0-6 months	7-18 months	19-36 months	37-60 months	More than 60 months	Total
VALUE (Average monthly registrations, $ million)							
1994	January-March	3.1	1.2	345.6	83.9	8.6	442.4
	April-August	12.6	22.2	52.2	170.7	33.9	291.6
	September-December	13.0	12.2	9.3	13.7	179.5	227.6
1995	January-December	48.2	27.3	9.2	8.5	277.6	370.7
1996	January-March	13.6	15.9	8.4	9.6	219.2	266.7
	April-June	59.4	18.3	6.4	113.6	120.3	318.0
% of TOTAL							
1994	January-March	0.7	0.3	78.1	19.0	2.0	100.0
	April-August	4.3	7.6	17.9	58.5	11.6	100.0
	September-December	5.7	5.3	4.1	6.0	78.9	100.0
1995	January-December	13.0	7.4	2.5	2.3	74.9	100.0
1996	January-March	5.1	6.0	3.1	3.6	82.2	100.0
	April-June	18.7	5.8	2.0	35.7	37.8	100.0

Source: Banco de la República.

effects of real wages on investment. Some authors have shown links between the internal funds of firms and their investment performance[12] and between the availability of domestic financing and construction activity, but there has been extensive controversy over the latter. A negative link between private and public sector investment may signal "crowding out" effects of the latter; but a better interpretation is simply that, due to the accelerator mechanism, private investment is procyclical, whereas public sector investment has historically behaved countercyclically (Cárdenas, 1991; Ocampo, 1989).
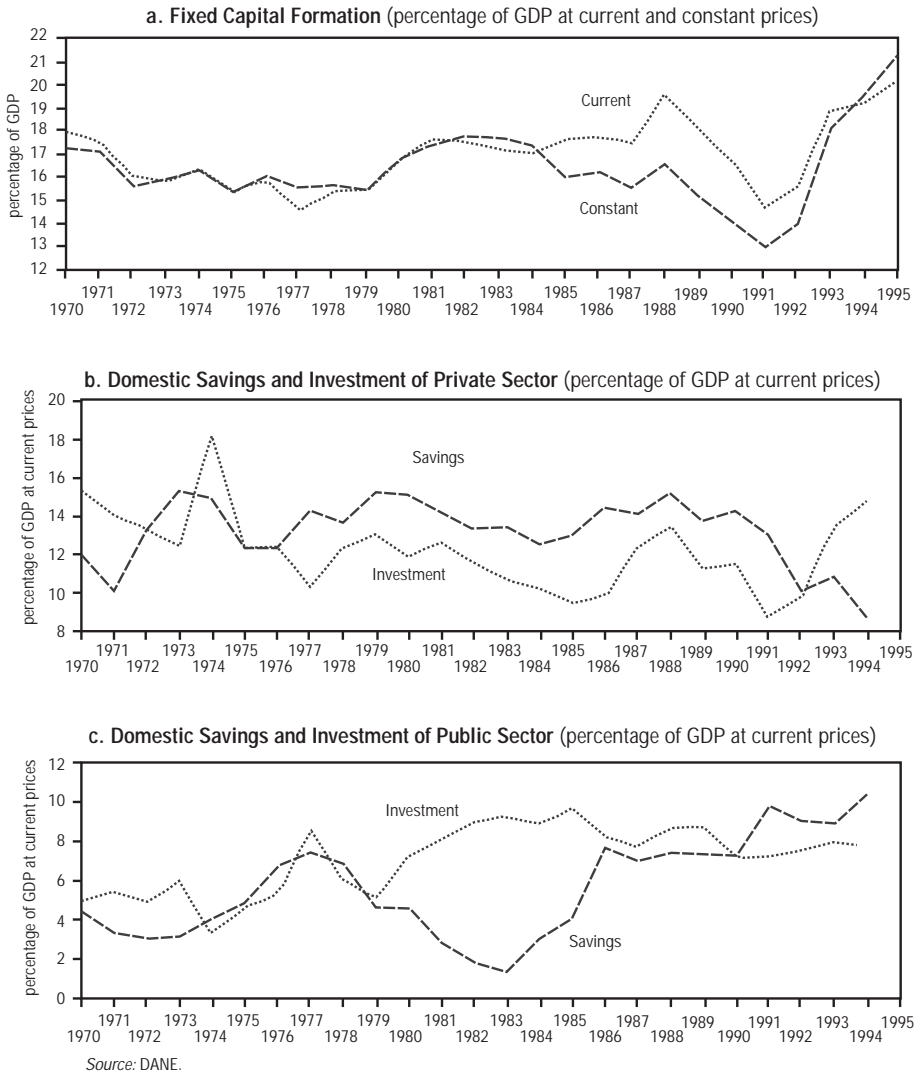
Among external variables, there is strong evidence for the link between the real exchange rate and the relative price of capital goods (machinery and equipment in particular); this implies that investment booms tend to coincide with periods of real exchange–rate appreciation. On the other hand, import controls apparently adversely affected investment in machinery and equipment in the past. Several papers have shown the positive effects of external financing on public sector investment from the 1950s to the 1970s; but this link disappears on inclusion of more recent data. Other evidence does show positive links between external financing and private investment for the 1970s as well as for the 1980s.

Among recent contributions, Cárdenas and Olivera (1995) and *Misión de Estudios del Mercado de Capitales* (1996) confirm the links between investment, economic activity and the relative price of capital goods; they also present some evidence for the interest rate sensitivity of private investment, but no sign of the effects of taxation on this variable. More importantly, they indicate that the price sensitivity of investment may have increased in the 1990s, which the authors interpret as evidence of the effects of trade liberalisation[13]. The latter work, as well as Partow (1996), indicate that the instabilities of GDP[14], inflation and real exchange rates have adverse effects on private investment. Sánchez (1994) has shown positive effects of infrastructure on the profitability of private capital and thus on private investment. Sánchez *et al.* (1996) find that domestic and particularly external financing have positive effects on investment by private firms.

Saving and Investment in the 1990s

The evolution of saving and investment in the 1990s appears in Table 6.7 and Figure 6.7. Three major trends stand out. *First,* investment, particularly private investment, has had a sharp cycle. The real investment ratio (relative to GDP) reached a three–decade minimum in 1991 but then increased sharply and in 1995 hit a three–decade peak. *Second,* the cycle has more sharply affected real rather than nominal investment, indicating strong fluctuations in the relative price of capital goods. Appreciation of the *peso* and reduced tariffs on capital goods have led to a strong reduction of the relative prices of machinery and equipment since 1992. The investment ratio at current prices — seen as the savings effort required to finance private investment — has *not* been particularly high in recent years. The nominal private investment ratio has had values similar to those in the late 1970s and 1980s and significantly lower than the peaks of the early 1970s. This indicates that high private investment ratios at constant prices basically reflect the reduction in the relative price of capital goods or, the equivalent, a massive transfer of resources towards private capital accumulation associated with the real appreciation of the *peso* and lower tariffs.

Figure 6.7. **Savings and Investment**

a. Fixed Capital Formation (percentage of GDP at current and constant prices)

b. Domestic Savings and Investment of Private Sector (percentage of GDP at current prices)

c. Domestic Savings and Investment of Public Sector (percentage of GDP at current prices)

Source: DANE.

Third, despite some recent deterioration in public sector savings, they remain high by historical standards[15] and the consolidated public sector deficit continues to be moderate. The increase in private investment, however, has coincided with a sharp fall of private savings. As a result, the private sector's consistent surpluses since the mid–1970s, which peaked at 4 per cent of GDP in 1991, fell dramatically thereafter, turning to a record quarter–century deficit of 6 per cent of GDP in 1994; according to preliminary figures, this deficit improved slightly in 1995 and 1996. Colombian economic history offers no comparable deterioration in the private sector balance. It occurred in both households and firms. The continued downward trend in household

Table 6.7. **Savings – Investment Balances**

(Percentage of GDP at current prices)

	1970-74	1975-79	1980-82	1983-86	1987-90	1991-94	1990	1991	1992	1993	1994
Private Sector											
Savings	12.99	13.47	14.10	13.27	14.22	10.14	14.14	12.95	9.98	10.73	8.60
Investment	14.59	12.02	11.99	9.75	12.06	11.81	11.41	8.71	9.70	13.24	14.68
Balance	-1.60	1.45	2.11	3.52	2.16	-1.67	2.73	4.23	0.29	-2.51	-6.08
Households											
Savings	8.09	8.83	8.39	8.00	6.95	6.58	6.56	9.13	6.54	5.98	6.12
Investment	5.21	5.12	4.94	6.27	5.27	5.03	4.57	4.04	5.26	5.20	5.40
Balance	2.88	3.71	3.45	1.73	1.68	1.97	1.99	5.09	1.28	0.78	0.72
Private Firms											
Savings	4.90	4.64	5.71	5.27	7.27	3.56	7.58	3.82	3.44	4.75	2.48
Investment	9.39	6.90	7.05	3.72	6.79	6.78	6.84	4.68	4.43	8.04	9.28
Balance	-4.49	-2.26	-1.34	1.55	0.48	-3.22	0.75	-0.86	-0.99	-3.29	-6.80
Public Sector											
Savings	3.60	6.11	3.09	4.04	7.22	8.86	7.22	9.73	9.02	8.82	10.35
Investment	4.91	5.93	8.07	8.99	8.07	7.48	7.14	7.24	7.50	7.94	7.70
Balance	-1.31	0.18	-4.98	-4.95	-0.85	1.38	0.08	2.49	1.52	0.87	2.65

Source: D.A.N.E. National Accounts.

savings since the 1980s led to disappearance of households' structural surpluses of previous decades. A rising trend in the savings ratio of private firms, quite noticeable in the second half of the 1980s, fell sharply in the early 1990s and has not recovered. Thus, contrary to the pattern of the early 1980s (and, indeed, in previous economic cycles), saving–investment imbalances have not stemmed in the current decade from public sector finances but rather from those of private agents, particularly firms. This process accompanied one of the most spectacular financial booms in Colombian economic history, one associated with both domestic and external financing.

Table 6.8 summarises the financial accounts of households and (private and public) firms. Net lending by households (which includes small enterprises) reached a quarter–century minimum in 1993–94, a pattern also evident in the acquisition of stocks and other property rights. At the same time, household borrowing (particularly on a long-term basis) has increased very rapidly, as reflected on the other side of the balance sheet in a peak of investments in liquid assets that exceeds by a wide margin that reached during the 1980–82 financial boom. The downward trend of savings has thus coincided in the 1990s with a boom in household financial investments, fuelled by increased borrowing in the financial markets. This process represents a financial deepening on both sides of the balance sheet.

Increasing funds for firms have also come from short–term and long–term borrowing. Funds secured by the issue of stocks and other property rights (funded mainly by the government and foreign firms, not by households) have not increased and have gone increasingly to purchase property rights in other firms. Thus borrowing basically funded the increase in funds available for investment, which reached a peak in 1993–94 similar to that of 1980–82. Although financial investments have also increased, they have been more than compensated by reduced commercial lending. This clearly indicates that the financial boom has allowed financial intermediation to replace direct commercial lending by firms.

On the whole, the significant reduction in private savings in the early 1990s became consistent with a private investment boom (more impressive at constant than at current prices) through increased borrowing by households and firms, which for the private sector as a whole basically came from abroad. Increased external financing has thus been determined by trends opposite to those which private savings and investment have shown over the decade. Increased demand for liquid assets has enhanced financial needs, particularly for households.

Determinants of Saving and Investment

What has determined this contrasting evolution of private savings and investment? To answer this question, the analysis here uses a series of econometric exercises on the determinants of savings and investment ratios (proportions of GDP at current prices) by economic agents in 1970–94. Following previous work on the subject, the estimated functions for the savings rates of households and private firms are:

<div align="center">

Table 6.8. **Financial Accounts of Households and Firms**

(Percentage of GDP at current prices)

</div>

	1970-74	1975-79	1980-82	1983-86	1987-90	1991-92	1993-94	1990	1991	1992	1993	1994
HOUSEHOLDS												
Sources												
Short-term borrowing	0.80	0.75	0.81	0.59	0.81	0.59	1.40	0.96	0.36	0.82	0.95	1.85
Long-term borrowing	1.78	1.31	1.54	2.08	1.44	2.58	5.35	1.16	0.91	4.24	4.64	6.06
Net lending to other agents	3.01	4.12	4.20	2.72	1.94	3.59	0.90	2.73	5.50	1.67	1.40	0.40
Uses												
Means of payments	1.32	1.77	0.98	1.12	0.90	1.17	1.17	0.77	1.06	1.28	1.23	1.11
Liquid assets	1.14	1.79	3.04	2.33	1.67	2.97	7.10	2.20	1.80	4.14	5.95	8.24
Property rights	2.08	1.16	1.17	0.94	0.79	0.86	0.05	0.89	1.48	0.24	0.05	0.05
Net commercial credits	-0.18	0.33	-0.18	0.14	0.09	-0.48	0.92	0.07	0.11	-1.07	-1.04	0.80
Forced labour savings[a]	1.04	1.20	1.21	1.02	0.90	0.93	0.95	0.74	0.77	1.09	0.99	0.91
Other (net)	0.19	-0.07	0.36	-0.21	-0.16	1.21	-0.68	0.17	1.53	0.89	-0.18	-1.19
FIRMS												
Sources												
Property rights	3.92	2.55	3.05	3.24	2.56	3.44	2.78	2.54	4.24	2.63	1.94	3.62
Short-term borrowing	1.78	3.32	4.56	1.74	2.54	1.27	3.58	2.28	0.72	1.82	4.08	3.09
Long-term borrowing	3.02	3.34	3.06	4.10	2.45	1.86	4.96	1.92	1.01	2.70	5.00	4.93
Forced labour savings[a]	0.43	0.62	0.71	0.45	0.32	0.30	0.38	0.21	0.09	0.52	0.43	0.34
Uses												
Means of payments	1.46	0.66	0.91	0.91	0.84	1.20	1.07	0.88	1.07	1.34	0.98	1.15
Liquid assets	0.51	0.66	1.34	1.01	1.53	1.59	3.25	1.40	0.89	2.29	2.37	4.14
Property rights	0.37	0.51	0.56	0.69	0.89	1.51	2.62	1.23	0.96	2.07	2.09	3.18
Net commercial credits	1.62	3.34	2.01	1.08	1.71	-0.15	-0.85	-1.82	-0.17	-0.14	1.21	-2.91
Other (net)	0.20	0.59	0.41	1.01	0.09	0.82	-0.03	-0.21	1.50	0.14	-0.08	0.02
Available for investment	5.99	4.07	6.15	4.82	2.79	1.89	5.65	5.47	1.81	1.97	4.88	6.41

a.   Labour payments by firms which according to Colombian law must be saved. They can be withdrawn for housing or in case of unemployment.

Source: Banco de la Republica.

$$Sh = Sh(Yk, g, i, dp, Th, Kp)$$

$$Sf = Sf(Rp, g, i, Tf, Kp)$$

Common determinants of both savings functions are the growth of GDP, g, to capture a procyclical savings pattern associated with high savings out of perceived temporary income; the real interest rate, i; and private capital flows, Kp, to capture the effects of external financing on savings. Savings also depend on household capital income, Yk, due to the higher propensity to save out of capital income, and on profits of private firms, Rp. They also depend on taxes, which in the case of households, Th, include direct and indirect taxes, and in the case of private firms, Tf, only direct taxes. Finally, domestic inflation, dp, is included as a determinant of household savings, to determine the "forced savings" effect of inflation.

The inclusion of the growth in domestic credit in the regressions did not give satisfactory statistical results. An attempt to discern the effects of different sources of private external financing (short- and long-term debt, and FDI) on savings and investment also met no success. A trade liberalisation index, L, which includes the overall average tariff and the tariff equivalent of quantitative import restrictions, was also tried as a determinant of household savings, to capture the effects of trade liberalisation on private consumption, but it had no significant effect. There is, however, a possible indirect effect of trade liberalisation on savings, as the share of profits in GDP has a positive association with the level of protection of domestic economic activities.

Table 6.9 summarises the results of the estimations of these functions. Both capital income and profits appear as important determinants of private savings. There is very strong substitution between household saving and external financing, but this does not hold for saving by private firms. There is also evidence of adverse effects of taxation on private savings. The influence is smaller, and its statistical significance weaker, in the case of households, whereas for private firms the estimated coefficient is not statistically different from –1, which indicates a full substitution of taxes for savings; in one equation, the coefficient is forced to adopt that value. Interest rates have positive effects on household saving; if included among the determinants of savings by private firms, however, they have an estimated negative effect and hence are excluded from the results shown in Table 6.9. The same result appears for saving functions for the private sector as a whole. Savings by both households and private firms have a weak procyclical pattern, with evidence of the forced–saving effect of inflation on households.

Table 6.9. **Determinants of Savings, 1970-94**

(t-statistic in parenthesis)

OLS Estimates	Households		Private Sector Firms			Public Sector	
Constant	-0.0700	-0.0790	-0.0187	-0.0098	-0.0007	-0.1171	-0.1043
	(-0.97)	(-1.59)	(-1.40)	(-0.95)	(-0.73)	(-5.85)	(-5.14)
Income from capital[a]	0.3109	0.3102	0.3935	0.4881	0.3670	0.2947	0.4326
	(3.41)	(3.30)	(4.14)	(6.66)	(5.88)	(2.27)	(2.38)
GDP Growth	0.2816		0.0994				
	(1.71)		(1.10)				
Real Interest Rate	0.2081	0.1293					
	(3.00)	(2.35)					
Inflation	(0.1626)	0.1009					
	(2.78)	(2.07)					
Taxes[b]	-0.3412		-1.1622	-1.2520	-1.0000	1.1534	1.0107
	(-1.52)		(-5.49)	(-6.73)		(8.05)	(6.62)
External Capital Flows	-0.3938	-0.3905	0.0792			-0.1630	
	(-3.02)	(-2.94)	(0.73)			(-1.33)	
AR1							0.4076
							(1.67)
Lagged Dependent Variable				0.32590		0.2768	
				(1.88)		(1.92)	
R²	0.66	0.59	0.76	0.74	0.73	0.89	0.89
DW	1.67	1.44	1.80	1.67	1.76	1.54	2.08

a. Households: non-wage income; Private Sector firms: profits; Public Sector: profits of public sector enterprises.
b. Households: direct and indirect taxes; Private Sector firms: direct taxes; Government total taxes.

For the public sector, a simple savings function is:

$$Sg = Sg(T, Rg, Kg)$$

Public sector savings depend on total taxes, T, profits of public sector firms, Rg, and net external borrowing by the public sector, Kg. Table 6.9 shows only weak evidence of substitution of external lending for public savings, with very high propensities to save out of taxes (not significantly different from one) and from profits of public sector firms. Together with the results on private savings, these results amount to strong evidence for the high propensity to save taxes, private and public sector profits and household capital income, confirming the effects of the domestic income distribution on saving.

For private investment, the estimated functions include the traditional accelerator and user–capital components, together with the effects of financial variables:

$$Ih = Ih(g, i, ph, Kp, Cd)$$

$$If = If(g, i, pf, Kp, Cd, Sf)$$

As the dependent variables are investment ratios, the estimations already assume an accelerator mechanism in which investment and GDP are related by a unitary elasticity. Thus, the procyclical effects of GDP growth on investment may be called the strong accelerator hypothesis. User–cost variables include the real interest rate and the relative price of capital goods purchased by households, *ph* (housing), and firms, *pf* (machinery and equipment). Financing determinants include external capital flows in both functions and savings by private firms in the case of their investment.

The estimations shown in Table 6.10 indicate the strong effects of relative prices on investment. As the dependent variable is the nominal investment ratio[16], the estimated negative coefficient indicates that investment by both households and firms is elastic to relative prices. The other basic component of user prices, interest rates, exercises no significant influence on investment. Also, although the effect of economic growth on investment is positive in both investment functions, its statistical significance is weak; thus the strong accelerator hypothesis remains unconfirmed[17]. External financing has strong effects on investment by private firms and a weaker effect on that of households. Saving by private firms also has an important effect on their investment. Through its effects on saving by private firms, taxation may have a negative effect on their investment[18]. Finally, domestic financing has no significant effect on private savings.

Table 6.10. **Determinants of Investment, 1970-94**

(t-statistic in parenthesis)

OLS Estimates	Households		Private Sector Firms		Public Sector	
Constant	0.1264	0.1242	0.1735	0.1957	0.0411	0.0231
	(3.50)	(3.49)	(2.06)	(2.33)	(3.66)	(1.81)
GDP Growth	0.0720		0.2309		-0.4440	
	(0.72)		(1.00)		(-3.62)	
Real Interest Rate			-0.0211			
			(-0.22)			
Relative prices[a]	-0.0756	-0.0703	-0.1462	-0.1644		
	(-2.11)	(-2.02)	(-1.69)	(-1.92)		
External Capital Flows	0.2165	0.2057	0.6483	0.7357	0.2167	0.0386
	(1.58)	(1.52)	(2.38)	(2.89)	(1.36)	(0.20)
Savings			0.5446	0.6416	0.1449	0.0049
			(1.32)	(1.77)	(1.33)	(0.03)
AR1			0.5603	0.6463		
			(2.35)	(3.63)		
Lagged Dependent Variable					0.5369	0.6739
					(4.00)	(4.13)
R^2	0.19	0.17	0.51	0.49	0.70	0.49
DW	1.72	1.66	1.68	1.79	1.93	2.19

a. Households: relative price of housing construction; Private firms: relative price of machinery and equipment.

For the public sector, a simple investment function is:

$Ig = Ig(Kg, Sg)$

Table 6.10 shows no evidence of the effects of either capital flows or savings on public sector investment, which basically has an inertial pattern. When GDP growth is included in the estimations, it has a statistically significant *negative* coefficient. This confirms the anticyclical management of public sector investment in Colombia.

Table 6.11 uses the estimated regressions to explain the evolution of savings and investment in the 1990s. These results indicate the crucial role that external private capital flows played in the evolution of private saving and investment in the first half of the decade. The external capital boom increased the private sector deficit through its adverse effect on household savings and its positive effect on investment by private firms. The latter effect more than compensated the adverse effect of reduced savings by private firms on their investment.

Increased taxation of the private sector reduced private saving, particularly by firms, but it increased public sector saving. For private firms, this effect appears only for the period 1990–94 as a whole, because direct taxes paid by these agents increased in 1991 as the result of the 1990 tax reform, and then declined. Overall, however, the net effect of higher taxation on savings was positive, although it had significant domestic distributive effects.

Reductions in the profits of private sector firms and, to a lesser extent, in household capital revenues (in 1991–94 only), probably associated with increased competition induced by trade liberalisation, also played a role as a determinant of the reduction in private savings. Falling inflation also had adverse effects on household savings, compensated by higher real interest rates. The reduction in the relative prices of machinery and equipment arising from exchange rate appreciation and tariff reduction strongly encouraged investment by firms; the effect would obviously be more important with real rather than nominal investment as the dependent variable. The increase in the relative price of housing construction had the opposite effect on household investments. Other variables (GDP growth, interest rates in the investment functions, and public sector external financing) played a secondary role.

Conclusions

The evidence presented in this chapter indicates that external financing had a crucial role in the evolution of saving and investment in Colombia in the 1990s. Economic policy was an essential determinant of private capital flows. Partial liberalisation of the capital account, particularly in September 1993, led to a boom in external financing. Interest rate differentials, associated with the joint effect of monetary and exchange rate policies, also played an important role. Nonetheless, Colombia's significant price–based controls on shorter term flows effectively reduced the *amount* of external financing and induced a debt structure with longer maturities.

Table 6.11. **Estimated Effects of Explanatory Variables on Savings and Investment during the 1990s**

	1990-94				1991-94			
	Change in Explanatory Variable	Households	Private Firms	Public Sector	Change in Explanatory Variable	Households	Private Firms	Public Sector
SAVINGS								
Change in dependent variable		-0.44	-5.10	3.12		-3.01	-1.34	
Income from capital								
Non wage income	1.56	0.48			-2.11	-0.66		
Profits of private firms	-2.83		-1.38		-2.10		-1.02	
Profits of public firms	-1.26			-0.37	-0.72			-0.21
GDP growth	1.26	0.36			3.54	1.00		
Real interest rate	8.57	1.78			4.92	1.02		
Inflation	-9.78	-1.59			-4.23	-0.69		
Taxes								
Direct and indirect	2.89	-0.99			2.92	-1.00		
Direct	1.13		-1.41		-0.82		1.03	
Total	4.12			4.75	2.18			2.51
External capital flows								
Private	5.39	-2.12			6.03	-2.38		
Public	-0.61			0.10	3.37			-0.55
Residual change		1.63	-2.31	-1.36		3.37	-0.66	-2.77
INVESTMENT								
Change in dependent variable		0.83	2.44			1.36	4.60	
GDP growth	1.26	0.09	0.29		3.54	0.25	0.82	
Real interest rate			-0.18		4.92		-0.10	
Relative prices								
Housing construction	12.79	-0.97			16.77	-1.27		
Machinery and equipment			3.02		-15.17		2.22	
External capital flows								
Private	5.39	1.17	3.49		6.03	1.31	3.91	
Private firms savings			-2.78		-1.34		-0.73	
Residual change		0.54	-1.40			-0.29	-1.51	

Increased capital flows partially substituted for household savings and encouraged investment by private firms. This, together with the effects of higher taxation on private savings, explains the sharp increase in the private deficit in the first half of the 1990s; at an aggregate level, however, increased taxes had a positive effect on savings, through their effect on public sector savings. Trade liberalisation may have played an indirect role in the evolution of private savings, through the adverse effects on private incomes characterised by high propensities to save (profits of private sector firms in particular). Revaluation and trade liberalisation reduced the relative prices of machinery and equipment, which had a strong positive effect on investment by private firms.

To the extent that they were accompanied by a large private imbalance reflected in increasing current account deficits, macroeconomic policies during the private investment boom were unsustainable. This warranted the adjustment policies adopted since 1994. Nonetheless they overshot somewhat, as the Colombian economy reflected in 1996. A more balanced policy mix, including moderate controls on capital flows, is thus the clue to the renewal of economic growth in the near future.

Notes

1. It was claimed at the time that the announced tariff reduction generated incentives to postpone imports. Contrary to this explanation, Ocampo (1993) has argued that this factor was secondary to domestic recession in affecting the demand for imports.

2. Interventions take place whenever the exchange rate reaches the upper or lower limits of a fluctuating "mini-band". The rules of intervention, including the design of the "mini-band", are set by the Board of *Banco de la República* but are not made public.

3. The course of inflation in 1996 reflects both strong inertia and the evolution of education and public utility prices, associated with increased wages in the first case and gradual reduction of subsidies in the latter.

4. Indeed, there is a *positive* statistical correlation between capital flows and interest rate margins for all groups of financial intermediaries, even if flows are lagged several months. This is true also for investment banks (*corporaciones financieras*) which serve that part of the corporate sector with easier access to international capital markets.

5. Since 1991, prior approval is required only for direct foreign investment in utilities, large mining activities, investment funds and banking; in banking domestic investors also face the same requirement. There are no restrictions on remittances by foreign companies. Some restrictions were introduced in 1994 on the purchase of real estate by foreigners.

6. This implies that for every $100 effectively used by the borrower, he had to deposit $47 at the Central Bank.

7. This requirement was in addition to the deposit which the borrower had to make for loans with less than the minimum maturity.

8. Indeed, during this speculative wave, some financial intermediaries increased their net foreign exchange assets using their *peso* funds.

9. As there have been strong regulations on import payments for consumer and intermediate goods, which restricted financing for those imports to 4-6 months over the period of analysis, it is expected that the imports of capital goods were the major activity variable determining foreign borrowing. Indeed, statistical estimates did not confirm a significant coefficient for total imports, when that variable (rather than imports of capital goods) was used in the regressions.

10. This is actually the opposite explanation from that used by Cárdenas and Barrera (1997), according to which the lack of statistical significance of the coefficient for interest rate differentials reflects the lack of effectiveness of controls. Actually, the opposite is probably true, as we argue here.

11. A notable exception is Fainboim (1990).

12. This association can be interpreted in the sense that good investment opportunities may increase retained profits.

13. A basic flaw in these results, however, is the high levels of inventory accumulation implicit in the post-1992 data in constant prices; this may be due to deficiencies in the deflators used to calculate them.

14. This variable is responsible, according to Partow (1996) for the instability of the marginal productivity of capital, which she includes as a determinant of private investment.

15. This is more clearly so if public sector savings are estimated including the capital gains from real exchange rate appreciation. See López (1996) and López *et al.* (1996*a*).

16. The nominal rather than the real investment ratio is used in the regressions, as there are no investment accounts by economic agents in constant prices (*ph* and *pf* are estimated indirectly from the original series, which refer to prices for housing and machinery), and as the deflators for inventories tend to overestimate the real investment ratios in recent years (see footnote 13).

17. An attempt to include estimates of capacity utilization rather than GDP growth in the regressions was equally unsatisfactory. Both results may be associated with the stability of economic growth in Colombia.

18. The use of tax revenues may be important. If they are used to expand infrastructure, the indirect effects may be positive, as the results of Sánchez (1994) indicate. The same may be true of investments in education, although probably with a significant lag.

Costs of Borrowing in Foreign Currencies with Deposits

Since deposits are dollar–denominated, the present value of their cost, per dollar borrowed *(Cd)*, is:

(1) Cd = d {1 – [(1+de)/(1+i)]}^td

where *d* is the deposit rate, *td* the time they have to be held, *de* the rate of devaluation and *i* the domestic interest rate.

Since the deposit and credit periods do not necessarily coincide, it is easier to estimate the future value of the loan *(Lf)*, including the future value of deposits:

(2) Lf = [(1+i*)(1+de)]^tc + Cd(1+i)^tc

where *i** is the external interest rate and tc the credit period. From (2), one can obtain the total annual costs of the loan *(z)*:

(3) z = Lf^(1/tc) – 1

The precise expression for *z* can be derived from equations (1) to (3).

Finally, the tax equivalent of deposits (TD) can be defined as:

(4) TD = {(1+z)/[(1+i*)(1+de)]} – 1

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VII

Capital Inflows and Investment Performance: Mexico

Ignacio Trigueros

ABSTRACT

This chapter analyses some features of the relationship between capital inflows and resource allocation in Mexico during 1990-94. The analysis begins with a characterisation of the capital inflows mix received by Mexico. This identifies the type of risk that the Mexican economy faced as a result of the level and composition of inflows. The identification of the risks highlights some weaknesses of the economic policy setting that prevailed at the time of the inflows. The author proceeds with an account of how capital inflows affected the allocation of domestic resources, highlighting the roles that structural reform and financial intermediation played in that process.

Introduction

The Mexican economy received large amounts of capital from abroad between 1990 and 1994. This episode coincided with a period of modest economic growth, after eight years of stagnation associated with the debt crisis. It also preceded Mexico's strongest economic contraction since 1932. It is hard to ignore the relationship between the dynamics of capital inflows and such contrasting performance of the Mexican economy. Questions remain about the specific aspects of capital inflows that led to such a dismal outcome. To enhance our understanding of the links between capital inflows and economic performance, this paper attempts to characterise how the interaction between capital inflows and various aspects of the economic policy setting affected the allocation of domestic resources.

This chapter has five sections. The first analyses the structure of the liabilities items of the capital account, to characterise the nature of capital inflows according to their maturity and to how they were linked to investment projects; it also discusses the extent and the type of risk that the mix of capital inflows posed for the performance of the Mexican economy. The next section discusses the economic policy setting that prevailed at the time of the capital inflows, mainly to identify the set of factors that may have attracted foreign capital to Mexico. An analysis of the economic policy setting also provides valuable elements for understanding the nature of the inflows, their link to investment performance and the problems arising from their large volume. The third section analyses the effects of the inflows on the allocation of domestic resources, assessing how they affected the structure of aggregate demand and the allocation of factors of production between tradable and non-tradable activities. The analysis focuses mainly on identifying the factors behind what appeared as a mild response of investment expenditures and poor production performance for tradable goods. It also addresses the extent to which these factors may have affected the sustainability of the inflows. The penultimate section deals with how some capital inflows were intermediated to their final users, and the final section summarises a set of results regarding the links between capital inflows and investment performance in Mexico.

The Nature of Capital Inflows

Table 7.1 presents the relevant figures on the liabilities structure of Mexico's capital account between 1989 and 1995, as reported quarterly by *Banco de Mexico*. They clearly show the strong surge in capital inflows — mainly private flows — that began in 1990 and ended in 1994. Although private sector flows dominated, portfolio investment in domestic currency securities issued by the public sector accounted for a significant fraction of the total[1]. This item, along with foreign direct investment (FDI), portfolio investment in the stock market and commercial banks' credits and deposits, accounted for more than 75 per cent of the capital inflows registered from 1990 to 1994. Indeed, the importance of commercial banks' credits and deposits could have been greater but for the introduction of some restrictions on this type of inflows during

Table 7.1. **Structure of Capital Inflows to Mexico**

($ million)

	1989	1990	1991	1992	1993	1994	1995
Public Sector	847.2	6 489.0	4 930.0	5 831.4	8 501.3	473.3	13 563.4
Credits and Deposits	996.2	6 212.0	-140.5	-3 990.4	-3 383.4	-1 564.2	24 784.7
Development Banks	-299.3	4 809.9	1 650.5	1 174.8	193.6	1 329.3	958.6
Banco de Mexico	1 676.6	-365.1	-220.0	-460.0	-1 174.9	-1 203.2	13 332.9
Other	-381.1	1 767.2	-1 571.0	-4 705.2	-2 402.1	-1 690.3	10 493.2
Portfolio Investment	-149.0	277.0	5 070.5	9 821.8	11 884.7	2 037.5	-11 221.3
Foreign Currency Securities	-149.0	277.0	1 674.8	1 552.1	4 872.0	3 979.8	2 569.3
Domestic Currency Securities	.0	.0	3 395.7	8 269.7	7 012.7	-1 942.3	-13 790.6
Private Sector	3 499.0	10 374.2	21 009.6	15 312.1	27 509.0	19 780.9	6 505.5
Credits and Deposits	76.9	4 647.5	8 576.1	2 577.2	6 085.6	2 663.7	-1 541.0
Commercial Banks	980.0	4 250.4	6 195.1	448.7	3 253.5	1 470.7	-4 982.0
Other	-1 156.9	397.1	2 381.0	2 128.5	2 832.1	1 193.0	3 441.0
Portfolio Investment	500.3	3 093.4	7 672.0	8 342.1	17 034.6	6 144.7	1 082.2
Commercial Banks	.0	.	.0	.0	1 345.0	100.0	874.0
Other Foreign Cy. Securities	7.0	1 099.0	1 340.0	3 559.0	4 580.0	2 244.0	-242.0
Domestic Currency Securities	.0	.0	.0	.0	393.0	-283.0	-69.0
Stock Market	493.3	1 994.4	6 332.0	4 783.1	10 716.6	4 083.7	519.2
Direct Foreign Investment	3 175.6	2 633.3	4 761.5	4 392.8	4 388.8	10 972.5	6 964.3
Total	**4 346.2**	**16 863.2**	**25 939.6**	**21 143.5**	**36 010.3**	**20 254.2**	**20 068.9**
Memo Items:							
Net Assets	-1 170.2	-8 699.5	-999.6	5 551.9	-3 602.5	-5 670.0	-5 956.8
Errors & Omissions	3 040.9	2 520.4	-2 166.8	-960.7	-3 142.4	-3 313.6	-3 805.2
Net Inflows	6 216.9	10 684.1	22 773.2	25 734.7	29 265.4	11 270.6	10 306.9

Source: Banco de México.

1992[2]. Throughout the period under study, no other restrictions applied to short-term capital movements. The prominence of portfolio investment in domestic currency securities and commercial banks' credits and deposits suggests that "risk-adjusted interest rate differentials" may have played an important role in motivating capital inflows. The high levels of FDI and portfolio investment in Mexican stocks point up, however, that other types of factors, like Mexico's growth prospects, may also have had a significant part.

Table 7.2 shows the basic statistics which describe quarterly time series data for the capital inflows reported in Table 7.1. It covers both the period of strong capital inflows and an extended sample that includes four quarters after the exchange rate crisis that took place in December 1994. Comparison of the two samples proves useful to assess the volatility of different types of capital inflow. The figures confirm the importance of the four types mentioned above in 1990–94, but notice how, in the extended sample, the share in the total of portfolio investment in domestic currency securities issued by the public sector declines to an almost negligible level. This highlights the strong and fast reversal of this type of inflows following the exchange rate crisis. Similar although less dramatic change occurred in the credits and deposits of commercial banks, also a highly volatile flow.

The coefficients of variation provide some additional insights on volatility[3]. As expected, FDI flows remained remarkably stable, even after the crisis. Something similar occurred with portfolio investments in Mexican stocks (both new and outstanding issues), foreign-currency securities issued by noncommercial-bank private firms (NBF) and NBF credits and deposits — although all these inflows showed more volatility than FDI. FDI and NBF credits and deposits also played a major role as marginal sources of funds, measured — as suggested by Classens *et al.* (1995) — by the slope coefficient of single regressions of the change in total inflows against different capital inflow items.

The stability of investments in securities issued by NBF and of the foreign credits they received responds partly to their maturity structures. For the former, the share of long-term securities (an average maturity of more than five years) in total foreign investment in this type of assets was 65.8 per cent in 1992, 77 per cent in 1993 and 101.3 per cent in 1994. The stability of portfolio investments in Mexican stocks can find a rationale in the argument that although the possibility of almost immediate liquidation would suggest volatility, the potential capital losses may induce the contrary. This line of reasoning would also imply that, to some extent, the degree of vulnerability of a country to short-term capital inflows might be associated with exchange-rate management. A commitment to exchange rate stability may attract short-term foreign investments in monetary assets, ready and able to fly when that commitment is perceived to be waning. Conversely, under a flexible exchange rate regime the possibility of incurring large capital losses at any time might discourage this type of investment.

Table 7.2. **Basic Statistics on Quarterly Time Series of Capital Inflows**

	1990-I to 1994-III			1990-I to 1995-IV		
	Mean ($ million)	Share on Total Inflows (%)	Coefficient of Variation (%)	Mean ($ million)	Share on Total Inflows (%)	Coefficient of Variation (%)
Public Sector						
Credit and Deposits						
Development Banks	408.61	6.33	209.04	421.53	7.21	197.85
Banco de Mexico	-170.49	-2.64	-205.88	412.90	7.06	514.06
Other	-435.08	-6.74	-261.96	78.83	1.35	2 083.71
Portfolio Investment						
Foreign Currency Securities	680.29	10.54	93.40	621.88	10.64	156.80
Domestic Currency Securities	1 424.21	22.07	81.54	147.26	2.52	1 718.95
Private Sector						
Credit and Deposits						
Commercial Banks	783.38	12.14	128.63	443.18	7.58	282.26
Other	481.72	7.46	95.83	515.53	8.82	94.81
Portfolio Investment						
Commercial Banks	257.50	3.99	140.58	210.82	3.61	146.16
Other Foreign Cy. Securities	663.63	10.28	89.63	524.17	8.97	128.50
Domestic Currency Securities	33.60	0.52	509.45	4.10	0.07	2 906.27
Stock Market	1 488.57	23.07	97.55	1 184.54	20.27	120.31
Direct Foreign Investment	1 338.19	20.74	63.43	1 421.38	24.32	55.57

Source: Banco de Mexico.

Some items reported in Table 7.2 show a sharp increase in the coefficient of variation when one moves from the shorter to the extended sample, indicating high volatility in these types of inflows. Such is the case for portfolio investments in domestic currency securities issued by the public and private sectors, and for commercial banks' credits and deposits. Before the exchange rate crisis, Mexico received close to $47 billion or 38 per cent of its total capital inflows through these sources. Other public-sector capital inflows also showed instability; for these inflows it might have arisen from specific aspects of economic policy management (discussed in more detail below). Especially relevant here are the large swings in the public sector's cash flow because of the privatisation process and the emergency loan negotiated with the US Treasury and the IMF during 1995.

Despite the great variability shown by some items reported in Table 7.2, total inflows maintained a rather stable profile during 1990–95 (their coefficient of variation is just 60 per cent)[4]. This suggests some substitutability between different categories of capital inflows. A simple test based on the sign and the magnitude of the correlation coefficient between different types of inflows, however, reveals no reasonable systematic substitution between them[5].

From the features of the different capital inflow items reviewed so far, close to 60 per cent of total foreign capital entering Mexico during 1990-94 does not appear to have been easily reversible. The non-negligible fraction of inflows that were volatile, however, posed some important problems, especially to the extent that international reserves did not fully back it[6]. In fact, from the beginning of 1990 to the third quarter of 1994 accumulated short-term inflows amounted to at least $40 billion while the increase in international reserves was close to $10 billion[7]. Thus, by the fourth quarter of 1994, the equivalent of at least 6 per cent of that year's GDP had been invested in short-term securities not backed by international reserves. The foreign payments situation of the Mexican economy before the December 1994 exchange rate crisis thus reflected a situation not unlike that described in the literature on bank runs, with the Mexican economy accumulating an increasing amount of short-term obligations that most certainly could not be honoured on demand. With no explicit or implicit guarantee on the country's foreign liabilities, the possibility of a run against financial assets issued in Mexico became increasingly imminent. Some signs of that type of reaction appeared during the first half of 1994, when as a result of political turmoil a sharp contraction of foreign investment in Mexican money market instruments took place. That reaction might easily have turned into a major run but for the response of the Mexican financial authorities. They covered foreign investors' exchange-rate risk through the issuance of dollar-denominated money-market government securities, known as *Tesobonos*. Nevertheless, that scheme did not last and by the end of 1994 a run of major proportions was well under way.

Before the issuance of *Tesobonos*, one of the risks posed by short-term inflows had to do with the possibility of maintaining a stable exchange rate. Because most short-term inflows were invested in peso-denominated securities, a run against them would clearly have resulted in a sharp depreciation of the Mexican peso. This possibility

reflected itself as, at various times before the exchange rate crisis, domestic interest rates exceeded levels that should have obtained based on non-covered interest arbitrage and the currency band then in place (Feliz and Welch, 1994; Hernández,1995). These high interest rates may have jeopardised an allocation of domestic resources consistent with the servicing of larger capital inflows. In their presence[8], defective regulation of financial intermediaries might easily have induced excessive risk taking under which the additional flows of hard currency needed to service an increased amount of foreign obligations could hardly appear.

Another risk had to do with the possibility of an unstable pattern of domestic absorption and economic activity. Even if an exchange-rate adjustment would have prevented a net outflow in the event of a run, lower inflows would have called for a sudden reduction in domestic expenditure and therefore in economic activity. Runs against peso-denominated securities occurred in March, June and November of 1994 (see *Banco de Mexico* 1995*a*), but they were faced partly by running down international reserves and partly by covering investors' exchange-rate risk with *Tesobonos*. These measures prevented a sharp and sudden adjustment in domestic expenditure but left the foreign payments situation more vulnerable. With the issuance of *Tesobonos*, solvency risk added to exchange rate risk. A large stock of short-term securities denominated in foreign currency implicitly exposed Mexico, in the event of a run, not only to a sudden interruption of capital inflows but also to their reversal, which could in turn trigger a situation of insolvency. This made the country extremely vulnerable to the sort of political events that in fact preceded the December 1994 exchange rate crisis[9].

Some of the capital inflows between 1990 and 1994 were linked directly to investment activities that would eventually service them. This clearly applied to FDI and probably, to a lesser extent, to the long-term transactions of private firms. Nevertheless, a non-negligible amount of foreign funds — close to 60 per cent of total capital inflows — had final destinations decided by domestic financial intermediation. These funds included not only the increase in commercial banks' foreign liabilities and other short-term transactions, but also some foreign resources invested in Mexican stocks through the secondary market, which typically liberated significant amounts of liquid funds. In this respect, a defective process of financial intermediation might have made problematic the surge in portfolio flows of the early 1990s.

The Economic Policy Setting

One can rationalise the surge of capital inflows in terms of a combination of domestic and external factors. Externally, as shown by Calvo *et al.* (1993), the behaviour of international interest rates, especially their low levels during 1992 and 1993, played a prominent role. Some regulatory reforms introduced in the US capital market also favoured the surge[10]. Domestic factors included various aspects of the economic policy setting in 1988-94 that may have had some bearing on the amount and structure of capital inflows as well as the effects of those inflows on resource allocation. Probably

the most relevant of them included a major rescheduling of Mexico's foreign debt under the Brady scheme; the implementation of an ambitious privatisation programme; the adoption of an exchange rate regime with a strong commitment to nominal exchange rate stability; and the implementation of a host of deep structural changes encompassing mainly trade liberalisation, deregulation of many areas of the Mexican economy and a free trade agreement with the United States and Canada. These policies and the way in which they might have been linked to the capital inflow episode require brief comment.

The Debt Agreement

In July 1989 the Mexican Government reached an agreement with most of its foreign creditors under the Brady scheme. The agreement encompassed a long-term settlement between Mexico and its creditors and a reduction, amounting to about one per cent of GDP, of transfers abroad related to public foreign debt. The deal had an almost immediate and significant effect on Mexico's country risk. It opened the possibility of increased access to foreign financial resources for both the public and the private sectors. The date of the debt agreement coincided closely with the start of the capital inflow episode.

The Privatisation Programme

Between 1988 and 1994 about 400 public-sector enterprises were privatised, liquidated or merged with other entities. The proceeds from privatisation of public-sector assets during that period amounted to about $25 billion. The privatisation programme affected capital inflows through three main channels: first, it attracted both resources of domestic residents held abroad and foreign resources to acquire privatised assets; second, it opening a host of investment opportunities previously reserved to the public sector; and third, the resources obtained by the government in the process permitted a large amortisation of public debt, as domestic public debt went from 19.5 per cent of GDP at the end of 1989 to just 5.4 per cent at the end of 1994. This public debt reduction played an important role in the expansion of bank credit during 1989–94, and therefore in the way in which a fraction of foreign savings was allocated to different activities.

The Exchange Rate Regime

Beginning in 1988, the Mexican financial authorities used different schemes that in one way or another encompassed a strong commitment toward nominal exchange rate stability. During 1988 the exchange rate remained fixed against the US dollar as a key part of the stabilisation programme. A modestly rising sliding peg followed, which eventually (in November 1991) turned into a currency band. This band was widened gradually until it had a difference of about 15 per cent between ceiling and floor before

the exchange rate regime collapsed in December 1994. Until February 1994, however, the Central Bank had pursued active inframarginal interventions within a narrower band, keeping the exchange rate practically fixed at an average level of 3.1 pesos to the dollar.

Exchange rate stability, along with a relatively tight fiscal policy — under which public expenditure expanded only to the extent that the decline in the public debt burden arising from amortisation's allowed for non-deficit financing — constituted the backbone of an ambitious stabilisation programme. Under it, the inflation rate declined over six years from three-digit to one-digit levels, an achievement that soon became a landmark for the Mexican financial authorities at that time. Exchange rate stability thus came to be taken almost for granted, helping to attract large amounts of foreign funds to peso-denominated short-term securities.

Once short-term assets held by foreigners reached a critical level, however, exchange rate management started to face constraints beyond those strictly related to promoting price stability. Fine tuning of the exchange rate became almost impossible. Any perception of exchange rate flexibility might have triggered a run against domestic currency assets held by foreigners and therefore a sharp adjustment of the exchange rate to avoid a solvency problem. In fact, the imminence of such a situation produced the *Tesobonos*. Before that action, the Mexican peso had already depreciated by 8 per cent against the US dollar within the band. This depreciation related closely to an increase in US interest rates and, more importantly (Leiderman and Thorne, 1996), to considerable political turmoil associated with the assassination of the ruling party's presidential candidate. The resultant uneasiness of foreign investors gradually provoked the substitution of *Tesobonos* for domestic currency assets in their portfolios. Once this substitution had taken place, the foreign payments situation became extremely vulnerable, leading eventually to an exchange rate crisis. The consequences for economic activity and welfare call into question the extended use of exchange rate management as an instrument to promote price stability.

Structural Change

Sweeping trade liberalisation in 1988, which encompassed a contraction of the average tariff rate from 22.7 per cent to 11 per cent, a reduction in the share of tradable output covered by import licensing from 35.8 per cent to 23.2 per cent and a continuous further deregulation effort thereafter, may have affected capital inflows in various ways. Perhaps the most important had to do with the idea that these structural changes produce a reduction in current output — as previously protected sectors contract — along with the prospect of higher economic growth because of increased productivity. The combination of these factors results in a situation in which desired expenditure exceeds current output, thus increasing the demand for funds from abroad. The opening of new investment opportunities typically enhances this trend. Additionally, the commitment to structural change favourably affects the assessment of country risk, which also increases the supply of foreign capital. High levels of FDI and foreign

investments in Mexican stocks since 1991, with a sharp increase in FDI during 1994 and 1995 even in the face of a non-recessionary environment in the US economy underscores the importance of domestic factors during Mexico's recent capital inflows surge. The implementation of NAFTA was especially relevant to the extent that it related closely to the surge in FDI after 1993.

Capital Inflows and Resource Allocation

This section reviews the main trends of the effects of capital inflows on resource allocation in 1990-95. It looks at how capital inflows were allocated between domestic consumption and domestic capital formation and how they affected the productive structure of the Mexican economy, with emphasis on the allocation of resources between the tradable and non-tradable goods sectors. These aspects of the resource-allocation process may provide useful insights into several issues such as the sustainability of the current account deficits that accompanied capital inflows and the contribution of foreign savings to economic growth.

The Dynamics of Capital Formation

Table 7.3 presents data relevant to the effects of increased foreign savings on the structure of domestic absorption. To highlight the effects of increased capital inflows, information for the ten years that preceded 1990–94 looks separately at the periods before and after the debt crisis. During the first of these periods capital inflows were obviously strong.

Table 7.3. **Structure of Domestic Absorption (Current Prices)**
(Period averages of GDP ratios, in per cent)[a]

	Private consumption	Government consumption	Gross fixed capital formation	Total gross capital formation
1980-81	64.73	10.40	25.57	27.27
	(0.35)	(0.37)	(0.81)	(0.11)
1982-89	65.51	9.09	19.11	20.54
	(3.37)	(0.58)	(1.58)	(1.27)
1990-94	70.63	9.89	19.74	23.28
	(0.40)	(1.15)	(0.71)	(0.81)

a.	Figures in parenthesis represent standard deviations.
Source:	INEGI.

Even measured at constant prices, the reaction of domestic investment to increased capital inflows in 1990-94 looks small, considering that during the adjustment period that followed the debt crisis capital formation explains about two-thirds of the contraction in the absorption-GDP ratio. Bear in mind, however, that a spurt of public sector investment projects was one of the forms taken by the lack of fiscal discipline before the debt crisis. Thus, the adoption of austerity measures to cope with the crisis might explain the strong contraction of capital formation after 1981. This feature is confirmed because, measured at either constant or current prices, the ratio of private investment to GDP was higher during the capital inflow episode of the early 1990s than in the years before the debt crisis (see Tables 7.3 and 7.4).

Table 7.4. **Structure of Domestic Absorption (Constant Prices)**
(Period averages of GDP ratios, measured at 1980 prices, in per cent)[a]

	Private consumption	Government consumption	Gross fixed capital formation			Total gross capital formation
			Total	Public	Private	
1980-81	64.62	10.10	25.60	11.32	14.27	27.95
	(0.45)	(0.06)	(0.84)	(0.66)	(0.17)	(0.79)
1982-89	62.71	11.30	17.53	6.19	11.34	17.54
	(0.76)	(0.42)	(1.82)	(1.56)	(0.88)	(1.86)
1990-94	66.35	10.80	20.35	4.52	15.83	20.72
	(0.54)	(0.05)	(1.06)	(0.33)	(1.35)	(1.21)
1995	62.45	11.11	16.06			14.30

a.   Figures in parenthesis represent standard deviations.
Source: INEGI.

The increase in foreign savings during 1990–94 had an important crowding-out effect on the domestic saving rate, as explained below. Because average public-sector saving showed a slight increase, the crowding out affected private saving especially strongly (Table 7.5).

Table 7.5. **Gross Savings**
(Period averages of GDP ratios measured at current pesos, in per cent)[a]

	Total domestic	Private domestic	Public domestic	Foreign
1980-81	24.87	n.a.	n.a.	2.4
	(0.03)	n.a.	n.a.	(0.18)
1982-89	25.4	22.05	2.99	-4.86
	(3.27)	(2.79)	(2.88)	(3.16)
1990-94	19.47	16.28	3.19	3.81
	(0.98)	(1.58)	(2.24)	(1.72)

a.   Figures in parenthesis represent standard deviations.
Source: INEGI.

The composition of investment expenditure reveals some additional insights on the effects of capital inflows on capital formation. The relevant figures are presented in Table 7.6, which shows that most of the contraction of fixed capital formation between the period before the debt crisis and the early 1990s is associated with a decline in public sector construction activities. For investment in machinery and equipment the contraction is mild, with an increase, much stronger for private investment, during the recent period of strong capital inflows. This reaction highlights the importance of modernisation efforts by domestic firms because of the major structural reforms during that period[11].

Table 7.6. **Composition of Fixed Capital Formation**

(Period averages of GDP ratios, measured at 1980 pesos, in per cent)[a]

	Total			Private	
	Construction	Machinery and equipment	Transport equipment	Construction	Machinery and equipment
1980-81	14.21	7.86	3.53	6.34	7.93
	(0.44)	(0.34)	(0.40)	(0.09)	(0.33)
1982-89	11.06	4.24	2.23	6.18	5.17
	(1.13)	(0.72)	(0.28)	(0.25)	(0.75)
1990-94	10.89	6.51	2.94	7.17	8.66
	(0.44)	(0.83)	(0.26)	(0.68)	(0.89)

a.   Figures in parenthesis represent standard deviations.
Source: INEGI.

Based on this evidence, one might argue that although domestic investment reacted weakly to increased capital inflows, an increased availability of foreign funds helped to upgrade the country's capital stock. Increased private investment in machinery and equipment suggests the introduction of better production techniques, while typically the contraction in public investment involved the suspension of undertakings with low social productivity. Nonetheless, the strong reaction of private consumption gives rise to questions about both the sustainability of the current account deficits associated with the increase in capital inflows, and the effects on economic growth of these inflows.

The sharp increase in domestic consumption between 1990 and 1994 has been rationalised (see for instance *Banco de Mexico* 1995b) in terms of: (1) a wealth effect arising from structural change policies; (2) the presence of credit constraints before the capital inflows episode; (3) the credit allocation practices of commercial banks; and (4) the presence of a Ricardian-equivalence type of response to the strengthening of the public sector's financial position. The discussion here concentrates on the first, the wealth effect. Its magnitude will set a reference for determining the importance of developments in the credit market and other events in explaining private consumption's increase. The Ricardian-equivalence type of response should have played a minor role, considering that the bulk of the fiscal adjustment dates back to the first years of the debt crisis. After that, as mentioned above, almost all the reduction in public debt

service attained through the privatisation process went to increase government consumption. Thus, an evaluation of the wealth effect would give, as a residual, a reasonable measure of the effect of banks' credit practices, liquidity constraints and perhaps other factors on the expansion of private consumption.

The nature of the wealth effects can be understood from the context, in which per-capita GDP remained practically constant during 1982-88 and registered a 1.1 per cent average annual growth rate from 1989 to 1994. Real wages in the formal sector of the economy increased by 30 per cent from 1987 to 1993, after a dip of approximately 40 per cent during the years of the debt crisis. These two sets of figures suggest that, from the point of view of Mexican consumers, the economic policy programme implemented since 1988 worked for their good, implying increased levels of current and future income and therefore higher consumption expenditure. Furthermore, as discussed in more detail below, because the incidence of structural change policies on different productive activities might well have led to a slow start for economic growth, a consumption-smoothing argument could rationalise a sharp increase in the private consumption-GDP ratio during the early 1990s.

To evaluate the magnitudes involved in this type of reasoning, various simulation experiments were run on a permanent-income current-account model (see, for instance, Blanchard, 1983; or Sachs, 1982), calibrated to resemble the structure of Mexico's aggregate demand during the period before the episode of high capital inflows[12]. The aim of the experiments was to obtain figures for the path of domestic consumption once the underlying conditions of the economy changed from stagnation to economic growth. The slow growth of the Mexican economy between 1989 and 1994 implied annual growth in per-capita GDP of 1.5 per cent to 2 per cent.

The figures describing the path of domestic consumption obtained from these experiments depend critically on the assumptions made with respect to capital formation dynamics and to the degree of consumption smoothing. For the former, the exercise assumed the economy to have a balanced growth path in which the capital-output ratio remains constant; this implies for the calibrated model gross capital formation of either 24.3 per cent or 25.5 per cent of GDP, according to whether per-capita GDP grows at 1.5 per cent or 2 per cent per year.

Consumption smoothing involved experiments with different formulations. A well-known theoretical result asserts that extreme consumption smoothing (introduced through the assumption of constant per-capita consumption through time) can give rise to extremely strong increases in current consumption expenditure once an economy moves from stagnation to economic growth (see, for instance, Blanchard, 1983). Considerably higher levels of future income allow this type of result without jeopardising the representative individual's intertemporal budget constraint. This assumption also gives rise to extremely large current account deficits, however, and therefore to levels of foreign indebtedness that defy the limits of the imagination. Thus some growth in per-capita consumption is necessary to induce reasonable predictions regarding foreign indebtedness.

The rate of growth in per-capita consumption can in turn be obtained through the Euler equation of a detailed aggregate general-equilibrium growth model of a small, open economy. Limited to simple growth models, this becomes quite awkward. For instance, assuming a constant rate of time preference, in a model which explains economic growth by labour-augmenting technological progress, the only way to obtain growth in per-capita consumption for the type of exercise of interest here is either to assume an absurd drop in the capital-output ratio or to get an unrealistic response of the supply of labour. On the other hand, with the rate of growth in per-capita consumption determined exogenously, it is hard to pin down the value that it should take. A sufficiently low value for that parameter could easily explain the observed increase in the ratio of consumption to output registered in the Mexican economy during the capital inflow episode, but it also produces a strong increase in the ratio of foreign debt to output, hard to justify in terms of Mexico's borrowing record.

Introducing a rate of time preference that varies according to the growth process, as suggested in Blanchard (1983), gives reasonable paths for the ratio of foreign debt to GDP, but the increase in the consumption-GDP ratio captures only the output shortfall attributable to a slow start in economic growth after structural reforms. This increase explains only between 11 per cent and 15 per cent of the ratio's observed expansion during the capital inflow episode.

These figures make it hard to rationalise the entire increase in the ratio of consumption expenditure to GDP based only on a wealth effect arising from more favourable perspectives about economic growth. This is especially true if one considers that the model's predictions may exaggerate the actual response of consumption expenditure to growth prospects, considering that uncertainty about these prospects should have resulted in a milder increase in consumption. This exercise therefore leads to the conclusion that factors other than higher permanent income arising from structural reforms should explain a fraction of the increase in consumption expenditure during 1990-94. Among them, liquidity constraints probably played an important role. Commercial banks' drive to capture the high interest margins associated with household credit surely had a key influence as well.

The Issue of Real Appreciation

Another important aspect of the resource allocation process arose because during the period under review Mexico's exchange rate against the US dollar registered a real appreciation of about 22 per cent. Thus, as shown in Table 7.7, a rough distinction between tradable and non-tradable productive activities (construction and services form the latter category) suggests that real appreciation discouraged, in relative terms, the production of tradable goods. Just as with the allocation of expenditure between consumption and investment, the rough facts deserve further clarification.

Table 7.7. **GDP by Sector**

Table 7.7. **GDP by Sector**

(GDP ratios in per cent, 1980 prices)

	1980-81	1982-89	1990-94
1. Agric. Livestock Forestry and Fishing	8.29	8.35	8.27
2. Mining	2.81	4.40	1.97
3. Manufacturing Industry	21.87	23.65	21.14
4. Construction	6.69	4.50	4.57
5. Public Utilities	0.95	1.08	1.47
6. Commerce, Restaurants and Hotels	27.79	27.78	23.00
7. Transportation and Communications	6.42	6.94	9.42
8. Financial Services	8.67	8.05	13.53
9. Other Services	17.59	16.34	18.93
Tradable Goods = (1)+(2)+(3)	32.97	36.40	31.38

Source: INEGI.

Consider, for instance, the sustainability of current account deficits. In this context, note that the growth of the financial services industry explains most of the increase in the share of non-tradable productive activities in GDP. Therefore, given the favourable effects that financial intermediation presumably has on the allocation of resources, it is not clear, at least in principle, whether the expansion in the production of services compromised the foreign payments situation of the economy. As matters finally turned out, financial intermediation did not have a clear favourable effect on the allocation of domestic resources, but this outcome seems only marginally related to real appreciation.

Another aspect of the resource allocation process that may have some bearing on sustainability is that during 1990–94 the change in productive structure within the manufacturing sector was perhaps stronger than that between tradable and non-tradable activities. This would make the fall in the share of manufacturing in GDP attributable to the gradual decline in various productive activities that followed the trade liberalisation measures, and not to a long-lasting weakening in the country's tradable output.

Table 7.8 presents some information on this issue, comparing the rates of growth of some specific activities within the manufacturing sector in 1990-93. The figures clearly show that, in spite of real appreciation, some tradable activities managed to achieve a significant expansion. Simultaneously, the strong contraction of other activities points to a dramatic transformation within Mexico's manufacturing sector. This scenario might help to rationalise the absence of a relation between capital inflows and economic growth identified by some authors for Mexico (Gruben and McLeod 1996), along a different line than that associated with sticky prices and real appreciation proposed by Dornbusch and Werner (1994).

Based on the information in Table 7.8 one can also estimate the amount of capital resources absorbed by the manufacturing sector from 1990 to 1993. Using figures on capital-output ratios for the level of disaggregation shown in the table[13], an estimate of gross fixed capital formation in the expanding sectors can be obtained from the figures on GDP growth. Taking an annual depreciation rate of 6 per cent, the estimate shows that close to 50 per cent of gross fixed capital formation during 1990–93 went to the expanding activities within the manufacturing sector. This suggests a problem of real appreciation not terribly adverse for the performance of the manufacturing sector. Clearly, real appreciation acted as a catalyst to wipe out the most backward firms that remained before the capital inflow episode, but it might also have hurt others that would have survived and grown with a higher real exchange rate. Thus, a difficult dilemma arises: while some firms might have survived with lower capital inflows, others would have not been able to expand without higher capital resources from abroad. The solution of this dilemma lies well beyond the scope of this paper — but the presence of some special factors during the capital inflow episode suggests that the perils of the Mexican economy associated with it find explanation outside a mechanical association between real appreciation and economic performance. By themselves, the vulnerability posed by short-term inflows, mentioned above, and a poor performance in the intermediation of some inflows, discussed in more detail below, were problematic enough to raise some additional concern with real appreciation.

Table 7.8. **Annual Growth Rate in Selected Manufacturing Activities, 1990-93**
(Period averages in per cent)

Winners		Losers	
Office machinery	19.8	Textile products	-2.8
Automobiles	25.0	Shoes & leather products	-2.6
Milk & milk products	8.7	Sisal products	-31.3
Petrochemicals	9.2	Sawmills	-2.3
Engines & auto parts	9.4	Railroad equipment	-16.9

Source: INEGI.

The Intermediation of Foreign Savings

As mentioned in the first section, the nature of capital inflows to Mexico during 1990–94 suggests that the final destination of a large fraction of them depended on domestic financial intermediation. Some capital inflow found its way into the Mexican financial system when residents substituted their holdings of financial assets sold to foreigners for other commercial bank liabilities. The large amortisation of public domestic debt that also took place set up the conditions for an extraordinary expansion of credit to the private sector. In fact, from December 1989 to December 1994 commercial bank credit to the non-financial private sector expanded by a factor of 3.5 in real terms. Thus, in one way or another, a large fraction of the financial resources coming from abroad found its way into the banking system.

It is to some extent natural to expect that such a rapid increase in bank-issued credit went hand in hand with a poor assessment of the creditworthiness of bank debtors. Three other factors make the case much more likely. One has to do with the idea that before the capital inflow episode a large fraction of commercial bank credit went to the public sector, leaving capabilities for assessing credit to private sector borrowers in short supply when needed. Another relates to the privatisation of commercial banks that started in June 1991. Before that date the public sector managed commercial banks, under a nationalisation decree issued in September 1982. By the last quarter of 1992 they all had been privatised. Both the long period of public-sector administration and the change in management that followed privatisation imply that commercial banks' information base might have not been the most appropriate to engage in a strong expansion of credit. A final factor involves commercial bank regulation: the implicit, unlimited deposit-insurance scheme might have left the assumption of excessive risk by the banks unchecked. Thus, a large fraction of the financial resources intermediated through the banking system may actually have been poorly allocated. This by itself probably has great importance for understanding the sustainability of Mexico's current account deficits and the growth effects associated with capital inflows[14].

To get an estimate of the magnitudes involved in this problem, consider for instance that the real flow (i.e. the change in the real stock) of commercial banks' credit to the private sector from 1990 through 1994 amounted to about 6.3 per cent of GDP, or one-third of gross capital formation during that same period. A large fraction of that credit went to the market segments with higher intermediation margins, i.e. small and medium-sized firms and households. The fraction of household credit to total credit increased from 9.6 per cent in December 1989 to 26.7 per cent in November 1994. Meanwhile, high domestic interest rates and financial margins pushed the lower-risk projects of large firms to search for funds on international markets.

Further support for the idea that credit allocation was not always appropriate lies in (1) the extraordinary increase in consumption expenditure, and (2) the jump in the banking system's non-performing loans in those four years from an almost negligible amount to about $15 billion, close to 9 per cent of the banks' total loans. These figures may underestimate the actual amount of non-performing loans to the extent that, according to Mexican standards, banks classify as non-performing only past-due payments, not the entire value of loans in difficulty.

With these orders of magnitude, it is not hard to attribute an important contribution by financial intermediaries to the poor growth performance of the Mexican economy during that period, and to the persistence of current account deficits. The sharp expansion of credit to the private sector likely accounts for the prominence of consumption expenditure in the expansion of aggregate demand. Excessive risk taking by commercial banks could add strength to this argument. Thus, for a fraction of capital inflows, the sources of hard currency necessary to service them were not being created, producing both persistent current account deficits which turned increasingly harder to finance, and only mild economic growth.

The weakness of the banking system also likely obstructed some aspects of macroeconomic policy management. Under certain circumstances, monetary policy might turn out to be too loose with non-performing loans increasing, especially in the presence of an implicit, unlimited deposit-insurance scheme, such as that prevailing in Mexico during the early 1990s. In fact, according to some analysts, this factor played an important role in shaping the collapse of the peso in December 1994 (see Sachs *et al.*, 1995).

Concluding Remarks

Considering the sharp contraction that the Mexican economy registered during the first two quarters of 1995 (on a seasonally adjusted basis, real GDP fell at an annual rate of 8.2 per cent), Mexico's capital inflow episode turned out to be problematic. According to the facts reviewed in this paper, it seems that mainly (1) a considerable fraction of volatile inflows; (2) the prevalence of a strong commitment toward nominal exchange rate stability; and (3) defective regulation of domestic financial intermediaries, interacted with each other to produce such a dismal outcome.

Volatile capital inflows exposed the economy to considerable exchange rate and solvency risks which fed into the behaviour of domestic interest rates, jeopardising stronger investment expenditure. The exchange rate regime helped to attract a large amount of volatile funds, which eventually imposed considerable constraint on the management of macroeconomic policy. Poor regulation of domestic financial intermediaries, along with high domestic interest rates, led to an inappropriate allocation of a fraction of capital inflows; that made current account deficits persistent and limited the economic growth effects of those inflows.

Significant positive aspects associated with capital inflows can be overlooked in an assessment of Mexican economic performance based on a look at broad aggregates. Even if the reaction of investment expenditure to capital inflows was perhaps mild, the mix between public and private investment, and that between investment in machinery and equipment and construction, suggest an upgrading in the quality of capital formation. An important fraction of domestic investment went to tradable goods activities, which showed strong growth despite considerable real appreciation. These investments might also explain the extraordinary performance of Mexico's manufacturing exports (a 26 per cent annual average growth rate in value terms) after the exchange rate crisis. On the other hand, mild economic growth during the period of large capital inflows is explained in part by a process of recomposition within the manufacturing sector arising from trade liberalisation and real exchange rate appreciation.

At the policy level, the recent Mexican experience suggests that the extended use of the exchange rate as a nominal anchor does not constitute an appropriate tool for a country that looks for unrestricted integration into the world capital markets. It also shows that sound regulation and supervision of domestic financial intermediaries effectively takes advantage of such integration. The Mexican experience points out that capital inflows often effectively contribute to enhancing the country's productive capacity. Had the regulation and supervision of financial intermediaries been more appropriate, those instances would have multiplied.

Notes

1. The increase in foreigners' holdings of domestic currency securities issued by the public sector in no way related to the financing of the fiscal deficit during that period. In fact, from 1990 to 1994 annual average PSBR, including revenue from the privatisation of public sector entities, amounted to -1.2 per cent of GDP. Thus, capital inflows intermediated through those securities correspond with either sterilisation operations carried on by the Central Bank or portfolio shifts by domestic residents from government securities to other assets.

2. Commercial banks were restricted with a 10 per cent limit on foreign liabilities with respect to total liabilities, and a requirement to place 15 per cent of foreign currency liabilities in low risk assets.

3. The analysis also included the persistence, impulse response and ability-to-predict tests suggested by Classens *et al.* (1995) in order to assess the temperature of different types of capital inflows. The results were rather disappointing to the extent that, with the benefit of hindsight after the exchange rate crisis of 1994, the degree of volatility identified by these tests was almost exactly the opposite of what the occurrence of the crisis suggests.

4. This low value for the coefficient of variation is explained to a great extent by the emergency loan mentioned above. As a result of the loan, capital outflows took place only in the last quarter of 1994, and were on the order of $2.5 billion, i.e. less than 50 per cent of the mean of total quarterly capital inflows from 1990 through 1995.

5. For instance, one finds a large negative correlation between commercial bank and *Banco de México* credits and deposits. There is in fact a clear negative relation between these two types of inflows during the first quarter of 1995, when part of the emergency loan was used to finance the liquidation of short-term foreign liabilities of commercial banks; but *Banco de México* credits and deposits seem to follow their own pattern and during the period under study public sector inflows played no role as marginal sources of funds. Therefore, other than that specific episode it is hard to imagine any explanation for a negative relation between those types of inflows.

6. The prominent role played by this factor in the generation of Mexico's balance-of-payments crisis in December of 1994 has been extensively mentioned in the literature. See for instance Calvo and Mendoza (1995) and Sachs *et al.* (1995).

7. For a time during the capital inflows episode the accumulation of international reserves was in fact higher, reaching a peak of $22 billion in February of 1994, but a set of political events after that date led to capital outflows and to the figure on international reserves accumulation reported in the text.

8. Ex-post annual real interest rates on commercial banks' money market securities in fact reached levels above 15 per cent at some dates during 1993 and 1994.

9. In the literature on Mexico's exchange rate crisis, there is often the argument that sterilisation of capital outflows also contributed to the weakening of Mexico's foreign payments position (see, for instance, Sachs, Tornell and Velasco, 1995; or Calvo and Mendoza, 1995). In the author's view, this argument is not entirely correct. Sterilisation of capital outflows should be understood as a necessary step to avoid major disruptions in domestic financial markets that would have resulted from a sharp contraction in the supply of base money as a consequence of the outflows. The disruption would come about because it is hard to expect that in a matter of a few days, the demand for base money, which at that time was composed almost entirely of cash holdings out of the banking system, will show any significant reaction to an increase in interest rates. Thus, the sterilisation of the outflows seems justifiable, and to the extent that it was carried on only to accommodate the economy's cash needs, its contribution to the weakening of the country's foreign payments situation should certainly have been minor.

10. Of which the introduction of rule 144a was perhaps the most important.

11. This evidence goes counter to the assertion in Dornbusch and Werner (1994) which, in order to strengthen the argument that low economic growth after Mexico's economic reform was associated with a misalignment of the real exchange rate, mentions, without providing the relevant data, that much of investment expenditure during the early 1990s was in residential and business structures.

12. The specific assumptions implicit in the calibration exercise are that the gross annual return on capital is 14 per cent, with 6 per cent annual depreciation. These figures, along with the ones on the structure of aggregate demand and the assumption of no growth in per-capita GDP (consistent with the situation prevailing before the capital inflows episode) imply that the capital output ratio is 2.5.

13. The figures on capital-output ratios correspond to 1989 and were taken from Hernández-Laos (1993).

14. McKinnon and Pill (1995) highlight the role of financial intermediation in the collapse of the Mexican peso in December of 1994.

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VIII

Capital Flows and Investment Performance: the Case of Peru

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ABSTRACT

This chapter analyses capital flows to Peru in the early 1990s, in the context of the radical stabilisation and reform programme undertaken by the Fujimori government. The needs of reducing inflation combined with the surge of capital inflows led to a rapid overvaluation of the currency. Together with rapidly rising output, this led to a large increase in the current account deficit. This implied an important source of balance–of–payments vulnerability, especially as a relatively large share of capital flows was potentially volatile. This potential vulnerability of the Peruvian economy was clearly perceived as it occurred just after the Mexican peso crisis. Adjustment took place emphasising expenditure–reducing policies, which implied a significant reduction of growth. The alternative of relying at least in part on expenditure–switching policies, which would have been less costly in terms of reduced growth, was not used.

Introduction

The Peruvian economy performed very badly in most respects from the mid–1970s to 1990. Since 1990, the Fujimori government has pursued a radical programme of stabilisation and market reforms. The programme has contributed to many significant improvements, particularly in reducing inflation, raising the investment ratio and increasing growth. Yet the rapid growth of the current account deficit became a potential Achilles' heel, particularly as a fairly large part of it was financed by relatively short–term capital flows. Adjustment carried out by the economic authorities has reduced the current account deficit with relative success, but has implied a significant reduction in output growth. This happened because, to an important extent, the measures taken have emphasised expenditure–reducing policies (*via* a tighter monetary and fiscal stance) and not used expenditure–switching policies such as measures to encourage a depreciation of the currency. The latter could have achieved a similar reduction in the current account deficit with a smaller decline in output. Expenditure–switching measures would have been particularly effective in the Peruvian economy, as the large current account deficit emerged at a time when the economy was still well below its production frontier.

The first section analyses the overall context of the Peruvian economy with a focus on macroeconomic policies. It also emphasises the recent increase in the level of investment. The second examines the sources and composition of foreign capital inflows between 1990 and 1995. Foreign direct investment (FDI) flows receive a careful analysis, evaluating the extent to which they likely will contribute to increased output in tradables. This section notes that portfolio flows account for a far smaller share of flows than in many Latin American countries, and recognises the rapid growth of short–term capital flows. It stresses the importance of the old debt overhang, another feature rather specific to Peru within Latin America. The third section analyses in depth the use of capital inflows, emphasising the increase in the investment ratio and the explanation of the current account deficit by the gap between private investment and saving. A final section concludes and draws policy lessons.

The Overall Context

The overall growth performance of the Peruvian economy in 1970–90 was very poor, with per capita GDP in 1990 well below its 1970 level — and indeed still below that level in 1995 despite important GDP growth since 1993. Serious macroeconomic problems characterised the 1980s and led to hyperinflation at the end of that decade. As a result of these problems, investment (particularly private investment) fell. According to Paredes (1995), private investment fell from an average of 20.2 per cent of GDP in 1960–75 to 16.3 per cent in 1976–89. The poor performance of the Peruvian economy worsened serious poverty. By 1990, more than a third of Peru's population lived in extreme poverty.

The ICOR grew from a level of around three in 1950–75 to above eight during 1975–89, which implied that the efficiency of investment declined significantly. To an important extent, this related to low levels of capacity utilisation. A sharp decline in total factor productivity, particularly marked in the industrial sector and with an especially negative effect on exports, accompanied this lower efficiency of investment. According to the World Bank's 1993 *World Development Report*, the growth of Peruvian exports during 1980–91 reached only one–fifth of the average export growth in lower middle income countries (the category to which Peru belongs) during that period. Peru exported 30 per cent less per capita in 1989 than in the first half of the 1970s.

Taking a longer view, i.e. looking at 1950–95, the Peruvian economy had two different growth phases. Between 1950 and the mid–1970s, it grew at a stable rate of 5.4 per cent, with an annual inflation of 9.5 per cent. During the second phase, from 1976 to 1995, GDP grew by a mere 0.8 per cent annually, which implied that per capita GDP fell on average by 1.4 per cent per year; inflation reached incredibly high levels, averaging 705 per cent for the period (Table 8.1).

Table 8.1. **Peru: Economic Evolution**
(average annual percentage changes)

	GDP	Savings	Investment	Inflation
1950-95	3.4	5.8	6.0	309.5
1950-75	5.4	7.8	8.8	9.5
1976-95	0.8	3.1	2.3	704.9

Source: INEI, *Compendio Estadístico*, several years; González, Levano and Llontop (1996).

Different trends in the growth of savings and investment can partly explain this evolution. Both were high (7.8 per cent and 8.8 per cent annual growth rates) during the phase when the Peruvian economy grew rapidly, and much lower during the phase of declining per capita GDP (1976–95). As González *et al.* (1996) emphasise, the variability rates of GDP, savings and investment increased significantly between 1950–75 and 1976–95.

In 1990, the election of President Fujimori led to a sharp change in economic policy with the adoption of a very stringent programme of stabilisation, a strategy for re–establishing relations with the international financial community, and a programme of radical and simultaneous structural reforms. The reforms included, among other policies, practically simultaneous liberalisation of foreign trade (which rapidly reduced both tariff and non–tariff barriers), the capital account and domestic capital markets, along with massive privatisation, establishment of clear rules for domestic and foreign investment and the deregulation of the labour market.

The Fujimori programme included from the beginning the return of Peru to the international financial community. As a result the World Bank and the IDB supported it from the start with major loans. Peru successfully finished a Rights Accumulation Programme (1991–92) with the IMF (which required it to clear up arrears with the IMF, World Bank and the IDB while observing IMF quarterly performance criteria), followed by two Extended Fund Facilities (1993–95 and 1996–98). Furthermore, Peru has reached two agreements with the Paris Club, and one with commercial banks (Brady). The second section below looks at the more detailed implications of these developments for the balance of payments.

The programme of stabilisation led to a sharp fall in inflation, which had peaked at a monthly rate of 60 per cent in July 1990 (it reached 400 per cent during the first month of the stabilisation plan). By 1995, its annual rate had dropped to just over 10 per cent (see Table 8.2).

Table 8.2. **Peru: Selected Economic Indicators**

	1990	1991	1992	1993	1994	1995	Jan–March 1996
	Annual percentage changes						
Real GDP	-3.8	2.9	-1.8	5.6	13.0	6.9	-1.6
Consumer prices (end of period)	7.650	139.0	57.0	40.0	15.0	10.0	5.0
	Per cent of GDP						
Domestic savings	13.4	14.7	12.5	14.5	17.2	17.5	

Source: Banco Central de Reserva del Perú, *Nota Semanal*, various issues.

One important element in the anti–inflationary strategy was the reduction of the combined public sector deficit which according to IMF figures fell significantly from 7.6 per cent of GDP in 1990 to 2.7 per cent in 1993. Public finances remained tight during the first half of 1994, but weakened somewhat from then until the end of 1995, reflecting increased social and capital spending as well as wage increases. Part of this deterioration was linked to the political cycle.

A tight monetary policy, along with increasingly large capital inflows, caused the exchange rate to strengthen. Machado (1997) has estimated from a simulation based on the results of co–integration regressions that capital inflows were the main cause of exchange rate appreciation. The estimates show that, defining a current account deficit of 3 per cent of GDP as sustainable (instead of the 5.2 per cent actual deficit in 1990–95), the exchange rate would have appreciated by only half of the actual appreciation. Short–run inflows (including errors and omissions) fully explain this excess appreciation in 1990–95.

The exchange rate policy pursued by the economic authorities throughout the period has involved a floating rate with interventions by the central bank. They appear to have broadly welcomed the stronger exchange rate as a valuable instrument for lowering inflation. During periods of strong pressures towards additional overvaluation due to large capital inflows (the first quarter of 1992 and the second half of 1993 as

well as part of 1994), however, the central bank intervened actively. Yet such intervention was not entirely successful in resisting the strengthening of the new sol; between December 1991 and March 1992, it appreciated by 19 per cent. Measurement of the extent of overvaluation depends crucially on the base period taken. It seems reasonable to take the average for 1990 (when the stabilisation programme started); with that average as 100 for the real exchange rate, it strengthened to 67.6 on average for 1991 and 65.6 for 1992, then weakened somewhat to 72.2 in 1993 but strengthened again to 66.5 in 1994 and 64.8 in 1995 (authors' calculations, based on central bank data for the multilateral real exchange rate). Thus by 1995 the average real exchange rate was *35 per cent greater* than in 1990.

A recent estimate of the real equilibrium exchange rate (Moguillansky, 1995) concludes that by 1994 the Peruvian exchange rate was 30 per cent overvalued in relation to an "equilibrium" exchange rate; this study provides a useful benchmark, as it is based on a model of intertemporal equilibrium developed by Edwards (1988) but incorporates the impact of external capital flows and trade liberalisation.

A major cause of the high level of overvaluation of the sol was the large capital inflows between the end of 1990 and early 1992 (for detailed discussion see the next section). Particularly during this period, the economic authorities gave greater priority to reducing inflation than to defending a competitive exchange rate. This policy pattern is fairly common to other stabilisation programmes, whose initial aim is rapid reduction of hyperinflation (Cardoso, 1996). As Agosin and Ffrench–Davis (1995) have pointed out, an appreciation of the exchange rate undermines one of the key aims of import liberalisation, to eliminate the anti–export bias linked to import protection. Simultaneously, it may weaken domestic producers' ability to compete with foreign goods, which become cheaper due both to tariff reductions and to exchange–rate overvaluation. Thus, an overvalued exchange rate — harmful under any circumstances — is particularly so if it occurs during or immediately after import liberalisation as in Peru in the 1990s. In this sense the Peruvian economic authorities, like their Argentinean and Brazilian colleagues, have faced a particularly difficult task in the 1990s because their trade liberalisation occurred at the same time as a large surge in capital inflows. This contrasts with Chile (Agosin, 1997, in this volume) where the economic authorities in the 1990s did not have to deal simultaneously with undertaking reforms and coping with a capital surge; Chile already had experienced — and seriously mishandled — both rapid reforms and a surge in capital inflows in the late 1970s and early 1980s

During 1993–95, the central bank increased its intervention in the foreign exchange market in an attempt to diminish the pressures on the currency to appreciate due to the large capital inflows; it also increased its sterilisation efforts to compensate for monetary effects, *via* open market operations. The stock of Central Reserve Bank Certificates of Deposit rose from $12 million in December 1993 (0.7 per cent of base money) to $1 085 million in September 1995 (35 per cent of base money). The central bank also established non–remunerated reserve requirements on both domestic and foreign currency deposits in November 1993.

Although estimates differ on the exact extent of overvaluation, very rapid growth of the current account deficit to a large figure in 1995 implied that the exchange rate was overvalued and/or that levels of absorption in the Peruvian economy were inconsistent with the balance of payments restriction. The deficit reached between 7.5 per cent and 9.5 per cent of GDP in 1995 (depending on how GDP is measured, a matter currently in debate in Peru, particularly as the national accounts are being revised). The deficit's high level as well as its increasing trend until late 1995 were widely seen as a potential Achilles' heel of what on the whole has been a rather successful economic programme since 1990 because it has led to sharp falls in inflation and (from 1993 to 1995) very rapid economic growth, albeit from very depressed levels.

The government responded to the growing current account deficit mainly by attempting to slow down the economy, using measures such as cutting government spending and tightening monetary policy, in the context of IMF programmes. This did lead to a reduction in the deficit. According to official figures, it fell from $4.3 billion in 1995 to $3.6 billion in 1996, still much higher than the $2.7 billion registered in 1994 and the $2 billion registered on average in 1991–94.

The economic authorities have not taken measures to restrict short–term capital inflows, measures which could have reduced the pressure towards strong overvaluation. It seems asymmetrical that the central bank has rightly put reserve requirements of 45 per cent on deposits in foreign currency for both prudential and other reasons but not done so for short–term credits in foreign exchange. This opens some room for "round–tripping" to avoid the reserve requirements on dollar deposits, which have great importance because the Peruvian economy is heavily dollarised (mainly as an after–effect of the hyperinflation, even though inflation was only 10 per cent in 1995); over two–thirds of both deposits and loans of the banking sector are denominated in dollars.

The dollarisation of the economy restricts more than in other countries the effectiveness of monetary policy, particularly as a weapon to reduce the current account deficit. Tightening monetary policy does lead to slower growth of domestic credit, but banks respond by increasing their borrowing in foreign currency which they can then on–lend, also in foreign currency, to the private sector. As described below, this is exactly what happened, especially in 1995 when foreign credit shot up. Furthermore (as Dancourt and Mendoza, 1996, argue), it produces an increased demand for deposits in *soles*, which become relatively more attractive than dollar deposits as the *soles* interest rate increases; and this pushes the exchange rate towards further revaluation.

Thus, the net effect of the monetary tightening seems to be a trend towards further strengthening of the currency and a substitution of foreign credit expansion (which can then continue to finance imports) for domestic credit expansion. As a result, given the policy stance of openness with respect to financial inflows, monetary tightening is not particularly effective in Peru to reduce the current–account deficit. If the intention is to reduce the deficit by cutting aggregate demand, tighter fiscal policy offers a far more effective way. Indeed, under the new Extended Fund Facility from the IMF the government committed itself to reduce the consolidated public sector deficit from 2.6 per cent of GDP in 1995 to zero in 1998. Nevertheless, although

a certain tightening of the fiscal stance can play a positive role in these circumstances, excessive tightening could have problematic effects: on the one hand it may imply a crucial reduction of essential government spending (e.g. in education), and on the other it can slow growth significantly.

Output has evolved between 1991 and 1995 both very favourably and far better than in the previous 15 years (although as pointed out above, per capita GDP has not yet recovered its 1970 level). Particularly high in 1993–95, growth peaked in 1994 at 13 per cent. The restrictive monetary and fiscal policies during 1995 to slow aggregate demand and reduce the current account deficit, however, not only slowed growth but turned it negative in December 1995, when GDP fell by 1.9 per cent, and in January–March 1996, when it fell by 1.6 per cent (Table 8.2).

A crucial element for understanding the impact of capital inflows on the recipient economy in the medium term is to assess the extent to which it has resulted in an increase in investment, whether this investment is efficient, and — especially — what proportion of that additional investment goes into tradables (Griffith–Jones *et al.*, 1992). The progress of investment in Peru has been particularly noteworthy. It grew by 12.9 per cent in 1991, fell slightly in 1992 (by 2.6 per cent), and then increased by 11.8 per cent in 1993, 29.2 per cent in 1994 and 20.1 per cent in 1995. As a result, the investment to GDP ratio (at current prices), which had averaged only 16.3 per cent in 1976–89, grew systematically from 16.7 per cent in 1991 to 22 per cent in 1994 and 24.2 per cent in 1995 (Table 8.3). Most of this has been private sector investment, which grew from 12.2 per cent of GDP in 1990 to 19.3 per cent in 1995. The rapid growth of the economy, increased credibility of policy and the success of sharply curbing Shining Path guerrilla activity all explain this rapid increase in private investment. Public investment also grew during this period, reaching 4.1 per cent of GDP in 1995. Although the increase in private investment has been very large, most of it has gone into construction, which grew very rapidly from 9.2 per cent of GDP in 1991 to 15.4 per cent in 1995. The increase in the share of GDP going to private investment in machinery and equipment, has been somewhat smaller, from 2.7 per cent in 1990 to 3.9 per cent in 1995; all the growth took place in 1994 and 1995.

These figures support the following conclusions:

— Gross domestic investment has grown very sharply during the 1990s, from 16.7 per cent of GDP in 1991 to 24.2 per cent in 1995, i.e. by 7.5 per cent of GDP. This is the main reason for the rapid growth of the current account deficit, as domestic savings — although they increased between 1991 and 1995 by an estimated 2.8 per cent (Table 8.2) — grew significantly less than gross domestic investment;

— Most of the growth of investment has been private;

— The largest part of the growth of private investment has been in building, which increased its estimated share of GDP by 6.2 per cent between 1991 and 1995;

— Although investment in machinery and equipment has grown rather fast, it started from such a low base that the increase between 1991 and 1995 corresponds only to an estimated 1.4 per cent of GDP.

Table 8.3. **GDP by Type of Spending, 1989-95**

(current prices)

	1989	1990	1991	1992	1993	1994	1995
Private consumption	72.1	76.7	79.3	79.0	77.7	73.6	72.4
Public consumption	7.0	6.1	5.8	6.6	6.6	7.3	8.3
Government	5.7	4.9	3.8	4.6	4.4	5.1	5.9
Others	1.9	1.2	2.0	2.1	2.2	2.3	2.4
Gross domestic investment	17.8	15.7	16.7	16.5	18.5	22.0	24.2
Fixed investment	16.8	14.9	14.5	15.2	16.8	21.0	23.4
Public	3.6	2.7	2.7	3.1	3.4	3.9	4.1
Central government	1.9	1.3	1.3	1.6	1.7	2.3	2.5
Others[a]	1.9	1.4	1.4	1.5	1.7	1.7	1.6
Private	13.2	12.2	11.7	12.0	13.4	17.1	19.3
Building	10.7	9.5	9.2	9.4	10.7	13.9	15.4
Machinery and equipment	2.5	2.7	2.5	2.6	2.7	3.2	3.9
Changes in stocks	1.0	0.8	2.3	1.3	1.8	1.0	0.8
Exports	14.4	13.2	10.0	10.8	10.7	11.4	11.6
Imports	11.3	11.7	11.8	13.0	13.5	14.3	16.5
GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a.   Includes state companies.
Source: Banco Central de Reserva.

These trends would indicate a positive development — the increase in investment — that explains the increasing and large current account deficit, an outcome far more positive than the Mexican experience in the early 1990s where rapidly growing consumption inflated the current account deficit; yet the high proportion of the increase in private investment in construction would seem to indicate that the output it generates will tend to go more into production of non–tradables, which would be rather worrying (see Griffith–Jones *et al.*, 1992; and Devlin *et al.*, 1995). A related problem: investment in building, mainly in local currency, tends to lead to higher real exchange rate appreciation than investment in machinery and equipment (the latter has a far higher foreign–exchange component). Furthermore clear empirical evidence (De Long *et al.*, 1991) shows that growth is much more strongly associated with investment in machinery and equipment than with other components of investment, implying a greater increase in productivity generated by investment in machinery than in building. Construction has a fairly intensive impact on employment during the first stage, but is fairly limited in generating jobs once buildings are finished; the reverse applies to machinery and equipment.

A focus on imports yields a somewhat more positive evaluation of trends in investment in machinery in the first part of the 1990s. Data on imports are reportedly somewhat more reliable than the national accounts data[1]. As Table 8.4 shows clearly, imports of capital goods have increased at a fairly high rate, reaching an average annual growth of 23 per cent in 1990–95, with very rapid growth increases of 50 per cent in 1994 and 40 per cent in 1995. This indicates a relatively important increase in investment in machinery and equipment (even if it still represents a very low proportion of GDP). A fairly important part of this investment could be going into tradables (a point taken up in the next section's look at FDI in mining). Among capital goods

Table 8.4. **FOB Imports According to Use and Economic Destination**[a]

($ million)

	1990	1991	1992	1993	1994	1995	Average annual growth rate 1990-95
I. CONSUMER GOODS	338.3	754.6	903.8	879.3	1 315.5	1 755.0	44.6%
Non-durable consumer goods	300.1	454.4	492.1	498.8	653.8	910.6	
Durable consumer goods	38.2	300.2	411.7	380.5	661.7	844.4	
II. INPUTS	1 333.4	1 514.1	1781.0	1 846.7	2 331.2	3 225.6	19.9%
Fuels, lubricants and others	305.0	367.9	395.7	321.4	321.4	593.7	
Raw materials (Agriculture)	83.9	78.9	107.0	114.2	134.1	162.2	
Raw materials (Industry)	944.5	1 067.3	1278.3	1 411.1	1875.7	2 469.7	
III. CAPITAL GOODS	885.8	934.8	1062.7	1 130.5	1 691.8	2 363.2	23.0%
Construction materials	36.2	46.0	59.3	68.1	113.7	205.9	
Capital goods for agriculture	40.1	10.8	13.5	37.2	31.5	35.7	
Capital goods for industry	567.8	560.8	569.9	695.8	1 005.9	1 466.4	
Transport equipment	241.7	317.2	420.0	329.4	540.7	655.2	
IV. OTHER GOODS[a]	364.3	392.0	253.9	193.1	236.8	344.4	3.3%
V. TOTAL IMPORTS (FOB)	2 921.8	3 595.5	4 001.4	4 049.6	5 575.3	7 688.2	22.2%

a.   Includes the donation of goods, inflows of goods under financial leasing and other goods not classified.

Source: BCRP; own calculations. Thanks go to Teresa Lamas and Renzo Rossini, who kindly provided up-dated and disaggregated information.

imports, the highest growth rate appears in construction materials for the building sector. Furthermore, consumption goods had the highest annual import growth rate in 1990–95, an average of 44.6 per cent, significantly faster than imports of capital goods. A major part of this increase occurred in 1991 (123 per cent that year), but such imports also grew significantly in 1994 (50 per cent) and in 1995 (33 per cent). Thus, although consumption as a share of GDP has fallen somewhat, the share of imported consumption goods in total consumption increased rather sharply. Taking all of these trends together and adding two other causal factors — the rapid appreciation of the real exchange rate and fairly rapid trade liberalisation — total imports grew fast in 1990–95, at an average rate of 22 per cent, with highs of 38 per cent in both 1994 and 1995.

Sources and Composition of Foreign Capital Inflows, 1990–95

Table 8.5 highlights six main features of the evolution of the balance of payments, based on recent central bank estimates. *First*, the current account deficit rose rapidly, to $4.3 billion in 1995 from $1.2 billion in 1991. Despite the quite impressive increase in exports of goods and services, imports of goods and services have grown far faster. *Second*, because capital inflows have been even larger than the current account deficit, net foreign exchange reserves have increased throughout the period, from $105 million in July 1990 to $2 billion in December 1992 and $6.6 billion in December 1995; the last is equivalent to around ten months of total imports. About one–third of these reserves correspond to the proceeds of the 45 per cent reserve requirements on dollar deposits[2]. *Third*, FDI takes a very high proportion of capital inflows. *Fourth*, portfolio investment accounts for a relatively small share. *Fifth*, short–term inflows (including errors and omissions) are important and climbing rapidly. *Sixth* and finally, the balance-of- payments figures in Table 8.5 reflect Peru's not yet completely regularised debt servicing situation. The four final points in this list receive further analysis below.

FDI Flows

A crucial element for understanding the potential sustainability of current account deficits relates to the nature of the capital inflows. Many of the features of capital flows to Peru differ from those going to the rest of Latin America in the first half of the 1990s. An apparently positive feature of those to Peru is the very high proportion of FDI — in 1994 and 1995 but not earlier, in 1991–1993. Given that long–term considerations motivate FDI, it is traditionally considered as a more stable, less volatile source of financing. Turner (1991), for example, carried out empirical tests for the volatility of capital flows to industrial countries for 1975–89, with results that allowed him to draw a clear "hierarchy of volatility" of different categories of flows, starting with the most stable and finishing with the least stable. The ranking is: (1) long–term bank flows; (2) direct investment; (3) investment in bonds; (4) investment in equities; and (5) short–term bank lending. Claessens *et al.* (1995) have somewhat surprisingly

Table 8.5. **Summary of the Balance of Payments**[a]
($ million)

Concept	1991	1992	1993	1994	1995
I. Current Account Balance	1 215	-2 038	-2 128	-2 698	-4 348
A. Goods (Trade Balance)	-139	-556	-570	1 107	-2 117
1 FOB Exports	3 391	3 534	3 515	4 555	5 482
2 FOB Imports	3 529	-4 090	4 084	5 661	-7 600
B. Services	-314	-598	-586	-519	-813
3 Exports	870	868	895	1 125	1 284
4 Imports	1 184	-1 466	1 481	1 644	-2 097
C. Factor Payments	1 208	-1 366	1 455	1 575	-1 853
5 Public	1 152	-1 244	1 301	1 337	-1 410
6 Private	-56	-122	-154	-238	-443
D. Current Transfers	446	482	484	502	435
II. Financial and Capital Account	-78	949	1 413	3 109	3 092
II.1 Financial Account	-26	979	1 492	3 126	3 056
E. Public Sector	-154	-404	546	-379	-75
7 Long-term loans	-154	-404	546	-379	-75
Disbursement	872	387	1 509	630	780
Amortisation	1 026	-791	-963	1 009	-855
8 Bonds	0	0	0	0	0
F. Private Sector	108	253	639	3 205	2 398
9 Long-term loans	115	108	46	329	177
10 Direct investment	-7	945	371	2 326	1 617
11 Portfolio investment	0	0	222	550	604
G. Short-term capital	20	1 130	202	364	683
II.2 Capital Account[b]	-52	-30	-79	-17	36
III. Net errors and Omissions	1 028	411	579	321	1 014
IV. Balance Financing	-379	-691	197	1 468	-173
H. Net reserves flows of BCRP (12-13)[c]	-837	-695	-747	-3 037	1 209
12 Variation in the balance of net reserves[c]	-773	-697	-741	-2 975	-1 141
13 Price effect and gold monetisation	64	-2	6	62	68
I. Exceptional financing	1 216	1 386	550	1 569	1 382
14 Refinancing	5 529	672	1 313	705	679
15 Debt forgiveness	12	53	7	138	20
16 Net arrears	-4 325	661	-770	726	683
MEMORANDUM					
Net external financing of the public sector	1 062	982	1 096	1 190	1 307
Privatisation incomes (direct investment)	0	6	160	2 086	691

a. Financial cost of the public debt service in arrears is included.
b. Unrequited private transfers are included.
c. Minus sign indicates increases in net reserves.

Source: BCRP, MEF, ADUANAS and enterprises; Banco Central de Reserva del Perú *Memoria Anual* for short-term capital flows (II.I.G.) and net errors and omissions (III).

found some evidence that the holding periods of foreign direct investors are no longer than those of investors in short–term capital; their paper seems to have methodological shortcomings, however (see Reisen, 1996). It is true as well that domestic political shocks can also affect FDI. Back on the positive side, Chuhan, Peréz–Quirós and Popper (1996) provide econometric evidence that short–term flows respond more than FDI to disturbances in other capital flows and in other countries. Another recent study (Frankel and Rose, 1995) provides empirical evidence that the higher the share of direct investment in total capital flows, the lower the likelihood of a foreign exchange crisis in a developing country. Therefore, the international evidence does offer some comfort for the high share of capital inflows to Peru *via* FDI.

A very high proportion of FDI flows to Peru (particularly in 1994 and to a lesser extent in 1995) went to purchase companies being privatised (Table 8.5, last line). Practically all ($2.1 billion) of the $2.3 billion of FDI in 1994 was for privatisation; for 1995 the share was $600 million in a total of $1.7 billion. Note in these figures that FDI *not* for privatisation rose to just over $1 billion in 1995 from around $200 million in 1993 and 1994.

FDI for privatisation is a source of concern for the future in that it has an important once–for–all effect as the massive privatisation programme will finish in the next few years. Another somewhat problematic feature: it does not by itself lead to an increase in productive capacity because basically it purchases existing capacity, although several of the privatisation deals in Peru have implied important commitments to future expansion of productive capacity. The government estimates that these additional commitments reached $4 billion, much of which has been invested. The privatisation process may also imply productivity and production gains even if new investment is not carried out. Another source of possible concern involves future impacts on the current account: a large share of the companies privatised is mainly in the non–tradable sector. Of the large foreign inflow for privatisation in 1994, a very sizeable proportion went to privatise the telephone company, sold for $1.4 billion (CONITE, 1995), with additional investment commitments of an estimated $1.8 billion largely fulfilled. Although some of those transactions in telecommunications will generate foreign exchange directly or indirectly *via* greater production of tradables, their main effect will increase the scale and productivity of non–tradable services.

Table 8.6 gives a detailed breakdown of total FDI stocks (including those for privatisation). The largest increase is in telecommunications, with rapid FDI growth in mining as well, more than doubled from $420 million in 1990 to $960 million in 1995; in energy, which leaped from $564 000 to $850 million; in industry, from $440 million to $640 million; and in finance, from $110 million to $470 million. Additional output generated by the investment in mining will go mainly to exports. That in energy and industry will go either to increases in domestic absorption or to import substitution. In telecommunications and in finance, production will consist mainly of non–tradable services, although FDI may have some, mainly indirect impact on the production of tradables. On balance, around half the FDI entering Peru in 1990–95 involved investment in tradables.

Table 8.6. **Stock of Foreign Direct Investment Registered According to Sector, 1988-95**

($ million)

SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
Agriculture	3.2	3.2	4.2	4.2	4.8	4.8	4.8	4.8
Trade	187.2	190.6	192.4	193.6	196.9	206.9	227.7	241.3
Communications	0.0	0.0	0.0	0.0	0.0	0.1	2 002.3	2 002.3
Construction	1.9	1.9	2.1	1.6	1.9	3.4	3.5	7.0
Energy	0.6	0.6	0.6	0.6	0.5	0.6	361.9	850.5
Finance	82.9	87.2	110.5	115.5	143.5	200.3	244.3	470.3
Industry	419.9	423.3	439.6	454.7	468.1	499.7	548.3	639.1
Mining	413.9	422.5	419.8	427.8	547.2	556.0	867.3	960.9
Fishing	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Petroleum	58.5	58.6	58.8	58.8	58.8	58.8	58.8	59.1
Services	35.9	37.0	37.7	38.8	38.7	41.2	42.0	43.3
Forestry	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Transport	4.5	4.5	5.2	5.4	4.8	30.6	30.9	30.9
Tourism	10.3	10.3	10.3	10.3	12.4	12.4	17.5	19.5
Housing	15.4	15.9	17.7	18.7	19.7	19.8	20.1	20.1
TOTAL	1 234.7	1 257.3	1 300.6	1 331.7	1 499.0	1 636.3	4 431.1	5 350.8

Source: CONITE (1995).

Table 8.7. **Probable Evolution in the Peruvian Mining Investment**

($ million)

	Total 1994-96	1997	1998	1999	2000	2001	2002	2003	Total 1994-2003
Prospecting-Exploration	700	300	200	150	150	100	100	100	1 800
Addition to Existing Capacity	1 161	457	161	131	60	60	60	60	2 150
Projects and Prospecting	692	722	717	755	546	650	350	300	4 732
Total	2 553	1 479	1 078	1 036	756	810	510	460	8 682

Source: Ministerio de Energía y Minas (1994).

In mining, not only will a very high share of output go into exports but also important new projects are planned; if they materialise, they should have a large impact on GDP and future exports. As a consequence, the paragraphs below examine in some detail planned investment in mining and its likely impact on output and exports. This approach seems valuable here; given the predominance of very large projects in mining, it is more useful to analyse these large projects than to use econometric or other projections based on past trends.

A useful base from which to start is the December 1994 *Plan Referencial de Mineria*, *1994–2003*, prepared jointly by the Ministry of Energy and Mines and the World Bank. As Table 8.7 shows, this document projects $4.3 billion of investment in mining for 1997–2000 and $6.1 billion for 1997–2003. This assumes large investments in projects like Quellaueco, Toromocho, La Granja and Michiquillay, as well as expansion of existing mines like Cerro Verde, Centromin, SPCC and Yanacocha. Based on the output projections from these investment plans, should they all materialise, and what seemed fairly realistic projections of prices at the time, the *Plan Referencial* projects a rather rapid increase in mining exports to $4.8 billion in the year 2000.

Some of the investment projected is reportedly too optimistic, however, as several of the projects assumed to take place in 1996–2000 may not do so, for reasons such as lack of sufficient feasibility studies, difficult geological conditions and other features which may make them unattractive. In fact, delays in starting many projects have already occurred, due in part to debate and negotiation under way between the government and entrepreneurs' representatives. Nevertheless, an important part of the projected investment apparently will take place, particularly if the investment environment in Peru remains favourable (no major political or economic shocks). According to expert estimates, a more likely maximum figure for investment in mining in 1996–2003 is $5.6 billion, 25 per cent less than the *Plan Referencial* projections. Of this, a fairly large proportion, $1.2 billion, is assumed to go to investment in exploration and $4.4 billion for expansion of existing projects and development of new ones, with most of it going into the latter. Long–term optimism on Peruvian mining exports is supported by the high bid made by a Canadian consortium for the huge Antamina copper deposit. If completed, this would become by far the largest single mining investment ever made in Peru. Developments in the gold sector, Peru's most visible success story over the past three years, also boost optimism. Continuous expansion of the Yanacocha mines is expected to continue to boost output and exports further.

Maintaining the same price assumptions as the *Plan Referencial* would imply an expansion of mining exports to around $3.7 billion in the year 2000. Given the level of Peruvian exports, this fairly significant increase could help reduce the current account deficit and compensate for declining inflows due to the end of privatisation and projected higher debt service (see below). The same benefits could well develop from FDI in energy, based on a very significant agreement between the Peruvian government and the Shell/Mobil consortium on an investment estimated at over $2.5 billion to develop the natural gas and hydrocarbon deposits in Camisea.

Development of Camisea, according to official forecasts, would allow Peru to become a net exporter of oil and hydrocarbons from around 2001; currently, net fuel imports are around $350 million a year.

Portfolio Flows

The relatively small share of portfolio flows in the total (Table 8.5) contrasts Peru with many Latin American countries, where portfolio flows have had a large share of capital inflows in the 1990s (Ffrench–Davis and Griffith–Jones, 1995). These portfolio flows are secondary purchases by foreigners of already–issued Peruvian shares on the Lima stock exchange; no primary issues of shares are traded to foreigners and primary ADRs are very limited, as are bonds placed on the international markets. Peruvian entrepreneurs have no tradition of funding increases in their companies' capital by primary issues of shares[3]. A further obstacle to primary equity issues, especially on the international markets, involves insufficient effort to meet the strict accounting and other requirements needed for issuing ADRs, for example. De la Puente (1995) reports a rather poor level of analysis of Peruvian companies, made not just by local banks and brokers but also by foreign ones, especially compared with bigger markets in Latin America such as Mexico, Argentina or Brazil.

Foreign investors have a very large role in secondary purchases on the Peruvian Stock Exchange, however. In December 1995, 60 per cent of securities registered in CAVAL (the Lima Stock Exchange service for securities deposit and settlement) were foreign share holdings. The value of such holdings reached $1.6 billion in that month, a huge increase over the $27 million held in December 1992. The largest investors in December 1995 were by far the United States ($880 million) and the United Kingdom ($330 million), with all others (such as Luxembourg and Panama) far less important (Bolsa de Valores de Lima, 1995 and Piazzon, 1995)[4].

The large stock and flows of foreign purchases of Peruvian shares make up an important factor (though clearly not the only and possibly not the main one) in the rapid rise in the prices of Peruvian shares. In nominal terms, the general index of the Lima Stock Exchange increased by 1 300 per cent between December 1991 and December 1994 (Banco Central de Reserva del Perú, May, 1995). Deflated by the consumer price index, the index rose by 460 per cent in the same period, with the rise in dollar terms even higher due to the appreciation of the currency.

Because practically all portfolio flows to Peru go into the secondary market, they do not have the positive effect of funding increases in productive capacity and lowering the cost of capital (a major beneficial effect from primary issues). Their main impact is to help push up the prices of stocks; this has a positive wealth effect that will tend to increase consumption and decrease savings, so that productive investment may even fall. Large flows into secondary purchases of shares may exacerbate the volatility of share prices, as illustrated by the impact of the Mexican peso crisis on prices on the Lima Stock Exchange. As in other Latin American countries

they fell, although the drop in Peruvian shares began slightly later than in other Latin America markets. The causes were various. At the time foreign investors had very positive perceptions of the Peruvian economy. Peru was a "recently emerging market" where recovery was more recent. The Peruvian market also is shallow and illiquid, which makes it harder for foreign investors to sell and keeps price/earnings ratios lower than in other Latin American countries[5].

Short–term Capital Flows

An important and rapidly growing category of flows, short–term capital inflows (and errors and omissions) reached $1.7 billion in 1995 and averaged around $1.2 billion in 1991–95 (Table 8.5). Until recently, short–term capital inflows and errors and omissions unfortunately were not separated in the statistics published by the central bank, which made analysis and policy making very difficult. Thus it is to be welcomed that the central bank has just started separating short–term capital inflows from errors and omissions in its weekly publication, *Nota Semanal*. Nevertheless, the figures estimated for total short–term capital flows — $238 million in 1994 and $690 million in 1995 (Banco Central, May 1996) — seem somewhat low and somewhat inconsistent with other central bank data, as well as with recent, higher IMF estimates. Errors and omissions in the older statistics (see Table 8.5) include categories like illegal income from exports of cocaine and poppy seeds (estimated to be at least around $500 million for 1995 although they were probably higher in previous years)[6], plus, reportedly, some workers' remittances.

One source of imprecision must be that for several categories of capital flows in Peru, no recording takes place at the moment capital crosses the borders. As a result, the central bank and other economic authorities rely on methods such as bi–annual surveys and registry of custodian arrangements at the Lima Stock Exchange. Even FDI bears no obligation or deadline to declare the inflow. The somewhat imprecise data thus gathered must be complemented by information from newspapers. This contrasts sharply with a country like Chile, which systematically records all capital inflows and outflows. The economic authorities in Peru give this lack of information as a reason why it would be more difficult to apply reserve requirements on short–term capital inflows as is done in Chile and Colombia.

Nevertheless, even when items such as coca exports and workers' remittances are subtracted, short–term capital flows hold an important share of total capital inflows. This implies a potential source of vulnerability for the Peruvian balance of payments. That a significant share of these short–term flows reportedly finances trade probably makes them potentially less volatile. Yet the Mexican peso crisis (Griffith–Jones, 1996) showed again that short–term credit lines, particularly to banks, are very vulnerable to non–renewal if the balance–of–payments situation becomes critical. During the crisis it was not just *Tesobonos* (Treasury Bills) that were difficult to place, but all short–term credit (particularly to banks) became very difficult to roll over, which accentuated the crisis significantly.

The relatively rapid growth of short–term credit in recent years implies that the share of short–term debt in total debt has grown. Total short–term credit (public and private) has gone from US $1.6 billion in 1990 (Ugarteche, 1996, based on Central Bank data), or less than ten per cent of total external debt, to $4.7 billion in September 1995, over 20 per cent of the total[7]. This was a rather worrying trend. Of the total short–term debt in 1995, $1.8 billion corresponded to short–term interbank credit, up from a mere $69 million in 1990. The portion of the total which corresponds to an increase in trade credit is largely welcome.

Debt Service

Peru, unlike most countries in Latin America, has not yet fully regularised its debt servicing situation, although the Fujimori administration has made very important progress in normalising relations with creditors. Progress came first with multilateral creditors, followed by several deals with the Paris Club. For commercial bank debt, there is an agreement for a Brady deal. The choices of options for banks within the Brady package are estimated[8] to imply that additional debt–service cash flow as a result of the deal would reach around $400 million annually in 1997–2001 and increase further to an estimated $640 million in 2002–2007.

The official bilateral debt also represents a very significant amount ($9.6 billion in mid–1995), because significant arrears had accumulated in previous periods. The future servicing of Paris Club debt will also increase somewhat. Both these two items and the increases in servicing of the commercial bank debt once the Brady deal is finalised will put additional pressure on the balance of payments. Increased debt service also puts more pressure on the fiscal accounts as the government has to find additional *soles* to feed the increased dollar debt service, particularly because a very high proportion of Peru's external debt is public: over 90 per cent of Peru's medium–term and long–term debt is public or publicly guaranteed.

For Paris Club debt, Peru has arranged with its creditors (particularly Switzerland, Canada and Germany, with similar transactions with Finland, Holland and others) several interesting debt–for–development and debt–for–environment deals, which have implied some (although not very much) debt reduction. It would be desirable to continue implementing such schemes, particularly for large creditors such as the United States. To the extent that this is feasible, it would provide valuable additional debt relief to the government to help fund increased social and/or environmental spending, both sectors which urgently need it.

Particularly because of large borrowing in the past and a prolonged period of arrears, but also due to new borrowing in recent years (see above and Table 8.5) Peru has a high debt burden by international standards. According to IMF estimates, Peru's debt/GDP ratio in 1995 was 55 per cent, above the 40 per cent considered internationally as a prudent maximum (Williamson, 1995); the debt–to–exports ratio also lies well above the 200 per cent considered prudent. Peru's high level of potentially volatile non–debt liabilities makes the country even more vulnerable.

Use of Capital Inflows

The level and composition of GDP are debated figures in Peru and the national accounts currently are being rebased and re–estimated. Available figures show a significant increase in investment as a proportion of GDP in recent years, from 16.4 per cent in 1992 to an estimated 21.5 per cent in 1994 and 23.7 per cent in 1995. The domestic savings ratio has also grown, but less than investment, from 11.6 per cent in 1992 to an estimated 16.3 per cent in 1995. Table 8.8 clearly reveals how the growing gap in 1992–95 between investment and domestic savings (which is equal to external savings) arises increasingly from the growing private–sector savings deficit. By 1995, the gap between investment and domestic saving reached 7.5 per cent of GDP, of which 6.1 per cent of GDP (over 80 per cent) came from investment in excess of saving in the private sector.

Table 8.8. **Investment and Savings (Current Prices)**

(Per cent of GDP)

		1992	1993	1994	1995
1	Investment	16.4	18.6	21.5	23.7
2	Domestic saving	11.6	13.3	16.2	16.3
3	External saving	4.8	5.2	5.2	7.5
4	Private investment	13.3	15.2	18.1	20.1
5	Private domestic savings	10.3	11.5	13.6	14.0
6	Private sector savings deficit	3.0	3.7	4.5	6.1

Note: Some of the figures are slightly different from previous tables, due to methodological differences.
Source: Banco Central de Reserva del Perú; several publications; interview material. Own calculations. Thanks go to Renzo Rossini who provided the information for lines 1, 2 and 3.

At one level, trends in Peru in the 1990s differ from those in much of Latin America in the early 1990s, particularly Mexico, because in Peru the growing private–sector savings deficit was caused by a very sharp increase in private investment, not sufficiently covered by a fairly important but significantly smaller increase in private savings. In Mexico and in much of Latin America (except Chile) private savings actually fell, which was one of the main counterparts of growing current account deficits (Uthoff and Titelman, 1997, in this volume).

Somewhat less benign in the Peruvian case, as discussed above and shown in Table 8.3, most of the increase in private investment seems, at least according to national accounts figures, to have gone into construction rather than machinery and equipment. As there is evidence that the latter contributes more to expansion of output and particularly that of tradables, this seems a source of concern. The analysis of imports, however, indicated somewhat higher growth of investment in machinery.

That such a large proportion of the growing current account deficit in Peru stemmed from the private sector savings deficit reveals a partial, somewhat worrying parallel with the Mexican situation in the early 1990s, where the large current account deficit arose entirely from private sector dissaving. One of the lessons learned (or

rather relearned) from the Mexican peso crisis is that the scale of the current account deficit and how it is funded (short vs. long term flows) is what matters, and not — as so many wrongly thought, in what became the "Lawson doctrine" — whether the current account deficit originates in the public or private sector (see Begg and Griffith–Jones, 1996).

Conclusions

One important question for the future concerns how much and how quickly increased investment will generate increased production in tradables, to help lower the high current account deficit and compensate both for higher debt service, as the Brady deal on commercial debt is finalised, and for declines in FDI related to the end of privatisations. An analysis of recent trends and likely future investment in mining gives a fairly optimistic picture of export prospects resulting from those investments[9]. Support also comes from likely large projects in sectors like energy, which can lead to significant import substitution once Camisea becomes operational, although there must be some concern about timing here, as in mining. The issue is not just expected growth of exports and import substitutes, but how soon. Investment in sectors like mining takes a long time to realise (with pre–investment phases such as feasibility studies also taking much time); unexpected delays due to geological or other factors are quite common, and this in fact is happening. As a result, both the level and the timing of export projections must be treated with caution.

The more immediate issue, of course, involves how much and how the very high current account deficit recorded in recent years needs to be cut. As regards "how much", the analysis is somewhat complex. The key aim is to avoid a deficit that could become unsustainable, i.e. to maintain one which can be externally financed while avoiding, especially, any major balance–of–payments crisis that would disrupt growth and confidence as well as damage employment, real wages, etc.

Take a concrete example. Defining a target external debt/GDP ratio of 40 per cent, noting that Peru's ratio currently lies fairly significantly above that level, and assuming that the Peruvian economy will grow on average at around 5 per cent would suggest a sustainable current account deficit for Peru at not much above 3 per cent of GDP[10]. Because Peruvian exports are likely to grow quite fast, a deficit on current account of around 4 per cent would seem "safe". This comes very close to the figure estimated by Reisen (1996), 3.8 per cent of GDP, as the steady–state current account deficit sustainable by Peru over the long term if the debt ratio remains constant and desired reserves are raised in proportion to import growth. If the goal were to cut the external debt/GDP ratio to 40 per cent, according to Reisen, the current account deficit as a proportion of GDP should be lower than 4 per cent. Encouragingly, these figures emerge not too much below the target agreed with the IMF for a new EFF programme for 1996–98 — a current account deficit of less than 5 per cent for 1998. It may be a source of some concern that this "safe" level would be achieved only in 1998, thus making the economy more vulnerable during the transition, but the very fact of active policies to reduce the deficit systematically should bring quite a lot of comfort.

As regards the "how", the economic authorities should place relatively greater emphasis than they currently do on policies that will weaken the overvalued exchange rate and not seek solely a reduction of aggregate demand, although clearly that has to play some role. Such a strategy would allow lowering the current account deficit with a smaller decline in growth than one based only on reducing aggregate demand. Relatively high growth is essential both to enhance domestic and foreign investors' confidence and commitment, and to retain popular support for the structural reform programme. Regardless of the nature and quality of the reforms, historical experience (for example in Chile in the 1980s) shows that their fruit can be obtained only if key macroeconomic variables (particularly the exchange rate) rest not too far from their "medium–term equilibrium" levels.

One policy measure that may be helpful to depreciate the exchange rate would discourage excessive surges in short–term capital inflows (such as occurred in 1995) with measures such as reserve requirements, as applied in Chile and Colombia, or taxes, as in Brazil. Such a measure would seem particularly appropriate for Peru as it would imply symmetry with the existing 45 per cent reserve requirements on foreign exchange deposits which have been implemented mainly for prudential considerations but which Peruvians can circumvent by borrowing abroad against their own assets[11]. As in other countries (including the successful East Asian ones), discouraging excessive short–term inflows also has the additional virtue that it lowers the stock of short–term assets in the country, thus reducing the danger of large outflows if perceptions of the sustainability of the balance of payments deteriorate.

The Peruvian economic authorities are reluctant to use this policy measure and have reportedly even resisted suggestions by the IMF to do so, for two reasons. The first is a practical one, that such a measure would be difficult to implement in Peru because not all capital flows are recorded. Yet it would seem very useful to record capital–flow transactions for other important reasons such as precise monitoring of trends as a basis for the design of overall macroeconomic policy. Therefore such recording would seem appropriate even if reserve requirements were not applied. Within the European Union and at the request of the emerging European central bank (the European Monetary Institute), more detailed recording of capital flows is under discussion with several European countries like the United Kingdom to achieve greater consistency with the more detailed recording done by countries like Germany and France. The second reason why Peruvian economic authorities seem unwilling to consider reserve requirements on excessive surges of short–term capital flows lies in fears that this could be associated, particularly by the Peruvian private sector, with a return to past interventionist policies. Such fears are misplaced because reserve requirements are a classic central bank policy instrument; their extension to certain types of capital inflows basically implies a small tax on those inflows. Tax policy is an integral and accepted part of the package of policy tools normally used in market economies.

Another source of concern, in Peru as elsewhere, involves the interaction between large capital inflows — a major part of which the banking system intermediates — and potential fragility of the system, particularly if flows change direction abruptly and/or a large depreciation occurs. In Peru the solvency of the banking system seems to have improved in recent years. The Superintendency of Banks and Insurance has a continuing programme to assure that financial institutions have adequate levels of provisioning and properly evaluate risks. Especially encouraging, the ratio of non–performing loans to total outstanding loans reportedly declined from 11.7 per cent in 1993 to 6.1 per cent in mid–1995; simultaneously, the ratio of bank provisioning to total outstanding non–performing loans increased from 60 per cent at end–1993 to close to 80 per cent in mid–1995 One must still worry, however, about the high level of dollarisation of credit in the banking system and the extent to which the risks arising from it are fully accounted for. Should a large depreciation occur, significant difficulties could arise on payments of credits in foreign currency granted by banks based in Peru to domestic users. This is not strictly exchange rate risk, but credit or default risk, often not fully appreciated in typical risk assessment (it was a serious problem in the Mexican case). Therefore, it is important that both banks and regulatory authorities recognise such potential risks in the design of risk evaluation and regulatory systems.

A final question relates to the existing level of investment and its sustainability as the current account deficit diminishes, particularly if this comes mainly through restrictive policies. The risk to avoid is that constraints originating in the balance of payments restrict growth of investment, which will become increasingly crucial to sustain rapid growth of output, particularly if existing capacity is exhausted. Until 1995 this risk did not seem great as the average rate of capacity utilisation in industry was still not very high, 66.5 per cent overall and 66 per cent for consumption goods, 73 per cent for intermediate inputs and only 34 per cent for capital goods (Banco Central de Reserva del Perú, February 1996). Peru thus remained below its production frontier in the mid–1990s, even if far closer to it than in 1990 (Pontificia Universidad Católica del Perú, July 1995). To the extent that FDI continues to play a large role after privatisation finishes, it will help to overcome risks that existing capacity will be exhausted. Yet it will also require increased levels of complementary investment in physical infrastructure, training, education, etc., most of which must come from public investment.

Peru differs from Mexico and Argentina in the early 1990s because they had little spare capacity and reduction of their current account deficits had to an important extent to come *via* reduction of aggregate demand. Peru, with plenty of existing spare capacity, had far more room (than was used) for expenditure-switching policies and in particular for exchange rate policy. As a consequence, the outcome could have implied a change in the structure and a smaller fall of aggregate demand to achieve the same drop in the current account deficit. Growth could have been higher.

Notes

1. Interview material.

2. Interview material.

3. Interview material.

4. The figures are at market prices.

5. Interview material.

6. Estimates based on interview material.

7. Central bank, *Nota Semanal*.

8. Interview material.

9. Incidentally, unlike in countries such as Chile, local entrepreneurs in Peru play a relatively important role in mining investments, partly because geological conditions support more relatively small mining projects.

10. This calculation of a "sustainable current account deficit" is based on Williamson's (1995) "rule of thumb" that the steady–state current account deficit (as a percentage of GDP) cannot exceed the rate of growth of nominal income in foreign currency multiplied by the maximum "safe" debt–income ratio; the latter is normally defined to be around 40 per cent; Cline (1995) justifies the choice of 40 per cent of GDP for external debt by the tendency in the historical record for countries that go beyond this level to get into serious debt difficulties.

11. Interview material.

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