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THE BEHAVIOR OF INTEREST RATES
AND REAL EXCHANGE RATES
DURING A LIBERALIZATION EPISODE:
THE CASE OF CHILE 1973-83

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The Behavior of Interest Rates
and Real Exchange Rates
During a Liberalization Episode:
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ABSTRACT

This paper analyzes the behavior of some key variables during the
recent economic liberalization reform attempted in Chile. The paper
concentrates on the behavior of the real exchange rate and nominal and real
interest rates during the period 1977-83. It is argued that as a consequence
of the liberalization of the capital account in Chile in 1979-81, dramatic
inflows of financial capital resulted. These capital inflows generated an
important increase in expenditure, and a lower relative price of tradables to
nontradables or real appreciation. Moreover, it is argued that it is the
liberalization of the capital account, and not the adoption of a preannounced
rate of devaluation, that generated the dramatic real appreciation of the
Chilean currency between 1979 and 1981. A model to analyze interest rate
behavior in a semi-open economy is also presented and applied to the case of
Chile. The results obtained suggest that during this period interest rates
responded both to open-economy and closed-economy factors. Among the former
the increase in the expected rate of devaluation was particularly important.

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INTRODUCTION

The study of Chile's modern economic history usually generates a sense of excitement and sadness. Excitement, because during the last 50 years Chile has been a social laboratory of sorts, where almost every possible type of economic policy has been experimented; sadness, because to a large extent all these experiments have ended up in failure and frustration.

The most recent of these "experiments" began in 1973, after the military overthrew President Salvador Allende. In the ten years following the coup, the military implemented deep reforms directed towards transforming Chile from an economy semi-isolated from the rest of the world, with strong government intervention, into a liberalized world-integrated economy where market forces were freely left to guide most of the economy's decisions. These liberalization reforms were carried out at the same time as a major stabilization program, aimed at reducing a 600 percent rate of inflation was being implemented. Many of the policies undertaken roughly correspond to what a vast number of economists have been advocating for developing countries -- trade was liberalized; the capital account was (partially) opened; interest rates were freed and an active domestic capital market was developed; the fiscal system was reformed with a value added tax replacing a cascading type sales tax; the social security system was reformed; and the private sector began to play a more active role in the growth and development process.

This period was characterized by acute contrasts. For example, while in 1973 Chile had the highest rate of inflation in the world (600%), in 1981

it had one of the lowest (9%). On the other hand, the rate of growth of real GDP fluctuated drastically: it was -13 percent in 1975; it then averaged almost 7 percent per annum during 1977-81; and became -15 percent in 1982. In fact, the rapid growth of real GDP in Chile during 1977-81 and the apparent success of other policies prompted some observers to (prematurely) talk about the Chilean miracle. By the end of 1981, however, the euphoria came to a sudden end, as it became evident that the growth pace of the previous years was not sustainable. The inflow of foreign capital was halted, the foreign debt could not be paid, real interest rates skyrocketed, and a severe financial crisis erupted. These events, and a drastic deterioration of the terms of trade -- which amounted to 26 percent between 1979 and 1983 --, provoked one of the worst recessions faced by the country, from which, at the time of this writing, it still has not fully recovered. In addition, a number of the reforms were partially reversed: tariff rates were hiked; capital movements were forbidden; the financial sector was plagued with bankruptcies, and was virtually nationalized. 1/

A number of economic puzzles have emerged from this experience, including the extremely high interest rates that prevailed throughout the episode and the persistence of unemployment. Also, the ultimate failure of the experiment has added considerable interest to the analysis. Here the most relevant question -- which has far-reaching policy implications for other developing countries -- is whether this failure was a consequence of the liberalization policies themselves, or if it was the result of other events, including foreign shocks and inappropriate macroeconomic policies.

In this paper, an attempt is made to provide some clues for answering this question. The analysis concentrates on some of the more controversial

aspects of the experiment -- opening of the external sector and real exchange rate appreciation, interest rates behavior, and stabilization policies in an open economy --, and tries to extract some lessons of experience that could, in principle, be applicable to other countries. This paper, then, does not provide a comprehensive account of the Chilean experiment with free market policies. This is deliberate, since at this time a number of such general interpretations are available, and the reader is referred to them. 2/ By focusing on some specific -- and especially controversial -- aspects of this experience it is hoped that a better understanding of this episode will be obtained.

The paper is organized in the following form. In Section I, the behavior of the real exchange rate and its relation to the liberalization of the capital account is investigated. A central question addressed in this section is whether, as some analysts have pointed out, having fixed th exchange rate to the U.S. dollar in June of 1979 constituted a major policy mistake. Section II deals with interest rates, and some plausible explanations for their puzzling behavior are offered. Even though exchange rate and interest rate behavior are intimately related I have decided to analyze these issues separately, so that a clearer perspective can be obtained. In Section III, some issues related to the Chilean stabilization program are discussed. In this section I compare the military's monetarist stabilization program of 1973-83 with the only previous serious monetary-type stabilization program in Chile -- the Klein-Saks Mission program of 1955-57. Finally, in Section IV, some concluding remarks are offered.

I. REAL EXCHANGE RATE AND THE LIBERALIZATION OF THE CAPITAL ACCOUNT

The behavior of the real exchange rate during the military experiment affected the developments of the Chilean economy in many important ways. 3/ Between the second quarter of 1979 and the second quarter of 1982 the (effective) real exchange rate appreciated by approximately 25 percent. This real appreciation has had a central role in most interpretations of the Chilean crisis of 1982. In fact, a number of authors have claimed that the adoption of a fixed exchange rate in June of 1979 was a major policy mistake that provoked the real appreciation and, in conjunction with other elements -- like the full indexation of wages to past inflation -- generated the subsequent crisis. 4/ In this section the behavior of the real exchange rate is analyzed, and it is argued that the main cause of the real appreciation was related to the massive capital inflows that followed the liberalization of the capital account in 1979. Some regression results reported provide support to this hypothesis. It is further argued that while the adoption of a fixed rate -- at the same time that wages were fully indexed to past inflation -- was a policy mistake, it was not a major one.

In Table 1 quarterly data on the behavior of the effective real exchange rate between 1977 and 1984 are presented. An increase in this index reflects a real depreciation, whereas a decline shows a real appreciation. As may be seen, between 1977 and the second quarter of 1979 -- in spite of the fact that the so-called tablita was in effect -- there was actually a slight real depreciation of the peso. 5/ However, starting in the third quarter of 1979, and up to the second quarter of 1982 a continuous and steep real

appreciation was observed, which at the end of the first quarter of 1982 had accumulated to 22 percent. In the second quarter of 1982, the fixed exchange rate system was abandoned and a succession of devaluations followed. The fixed rate was first replaced by a system where the exchange rate was pegged to a basket. This was soon replaced by a floating system, which in turn was quickly replaced by a crawling peg. This system is in effect at the time of this writing. Between the abandonment of the fixed parity and mid-1984 a real effective depreciation of almost 13 percent has taken place. 6/

Although the domestic capital market was reformed in early 1975 -- with interest rates being freed and the creation of new financial institutions allowed -- foreign capital flows were strictly controlled until mid-1979. In June of that year a process of liberalization of the capital account of the balance of payments was begun; restrictions on medium- and long-run capital movements were lifted. The final steps in this process were taken in April of 1980 when additional regulations regarding the maximum monthly inflow of foreign capital were relaxed. 7/ Short-term capital movements, however, were forbidden throughout most of the experiment. In July of 1982, and for a brief period of time thereafter, short-term inflows were also allowed.

Even though throughout most of the experiment only medium- and long-term capital movements were permitted, the opening of the capital account resulted in extremely large inflows of foreign capital. In 1980, capital inflows more than doubled with respect to 1979, and in 1981 the level of capital inflows doubled again. In Table 2, biannual data on net capital inflows in U.S. dollars are presented for 1977 through 1982. The most striking feature of these data is the very rapid increase in the net inflow in the period 1978-81 and equally rapid decline in 1982. Most of the increased

foreign indebtedness between 1979-81 took place through higher loans obtained by the private sector without any government guarantees. For example, in 1979 the private sector obtained 98 percent of the foreign funds imported through Article 14 of the Exchange Law. In 1980 that figure was 97 percent, in 1981 it was 98 percent and in 1982 it was 77 percent. Most of these funds were obtained by the banking sector, which in turn loaned it to the final users. Banks, however, were not allowed to take the exchange risk; all their loans financed with foreign funds were documented in foreign exchange. The final borrower was subject to the devaluation risk. These regulations generated a highly segmented credit market, where only some agents had access to the "relatively cheap" credit denominated in foreign exchange.

The massive inflow of foreign capital experienced between mid-1979 and mid-1981 was the main factor behind the real appreciation of the peso. In fact, the absorption of these foreign funds required a real appreciation. From an analytical perspective, the reason for this is that, to the extent that a fraction of the net inflowing capital is spent on nontradable goods, an incipient excess demand for this type of goods will emerge; in order to restore equilibrium, nontradable goods' relative prices will have to increase, and a real appreciation will result. 8/ This was indeed the case in Chile, where a large proportion of the newly imported foreign capital was used to finance a dramatic boom in the construction sector.

The fact that a real appreciation is actually required to absorb an increase in the level of net capital inflows, introduces an important element in the discussion of the Chilean experience. This means that the 1979-1981 real appreciation was a short-run equilibrium phenomenon. It was an equilibrium phenomenon in the sense that, given the level of the capital

inflows, the real appreciation was needed to maintain internal equilibrium in the nontradable goods sector. On the other hand, it was a short-run phenomenon, since the rate at which capital flowed into Chile between mid-1979 and mid-1981 was not sustainable in the long run. Once the nature of the real appreciation of 1979-1981 is understood in this way, it becomes clear that the adoption of a fixed rate in 1979 was not the main cause of the real apprecia- tion. Independently of the exchange rate system, the absorption of a massive inflow of capital would have required a real appreciation. This means that, if instead of having pegged the peso to the dollar in June of 1979, Chile had adopted a floating rate, the opening of the capital account carried out between June of 1979 and mid-1980, would have resulted in a nominal, as well as real, appreciation of the peso. 9/

However, it is important to notice that the rate of capital inflows is an endogenous variable which, at least in principle, will differ under alternative exchange rate systems. To the extent that these inflows respond to interest rate differentials, it is likely that their magnitude would be somewhat lower under floating or adjustable exchange rates. In the Chilean case, however, the existing evidence suggests that for the 1979-1981 period, capital inflows were not sensitive to changes in interest rate differ- entials. Sjaastad, for example, reports that between August of 1979 and December of 1980 there was a weak relationship between the rate of capital inflows the domestic and foreign interest rates spread. Between January 1981 and March 1982 this relationship, however, basically disappeared. 10/ If capital inflows didn't respond to interest rate differentials, what explains, then, the massive inflow of foreign funds? A simple explanation is based on the idea that immediately after the liberalization reforms, the perceived

profitability of domestic investment -- as seen from abroad -- increases

dramatically. This provokes a portfolio disequilibrium in the developed

countries, since investors now want to hold a significantly higher fraction of

the liberalizing country's capital stock as part of their portfolios. As a

result, immediately following the liberalization, capital inflows into the

country will jump. As time goes by, however, and the portfolio imbalance in

the developed countries is solved, the flow of foreign capital into the

country will slowly decline towards its new long-run equilibrium.

Alternatively, we can think that during the period of capital controls a large

stock disequilibrium had developed, with the desired level of foreign debt

well above its actual level. In this setting, once the capital account is

opened, there is a tendency to solve this stock disequilibrium fairly fast.

This will result in massive inflows of foreign funds in the short run. In

fact, short-run capital inflows will overshoot their new long-run

postliberalization level. This behavior of net capital inflows can be modeled

in the following form: $\Delta K = \min [\overline{\Delta K}, \theta(D^* - D_{-1})]$, where ΔK are actual

capital flows, $\overline{\Delta K}$ is the maximum amount of net capital inflow allowed every

period before the capital account liberalization. D^* is the desired or

sustainable level of foreign debt, which will depend on real permanent income,

and real wealth among other things. D_{-1} is the actual stock of debt in the

previous period and θ is a partial adjustment coefficient. Clearly, if

prior to the liberalization $\overline{\Delta K} < \theta[D^* - D_{-1}]$ the gap between desired and

actual debt will increase through time. Once the restrictions on capital

inflows are lifted, actual inflows will become equal to $\theta[D^* - D_{-1}]$. That

means that, as with the alternative interpretation discussed above,

immediately following the opening of the capital account capital flows will

jump to a fraction θ of the accumulated gap between the desired and actual
debt. As this gap is closed,the level of capital inflows will slowly be
reduced until it reaches a new equilibrium level. 11/ This was clearly the case
of Chile where during 1980-81 the inflow of foreign funds was extraordinary
and greatly exceeded its sustainable long-run level.

The existence of a fixed nominal exchange rate since June of 1979
made things even worse. First, the slow (approximate) convergence of domestic
inflation towards world inflation, after the exchange rate had been fixed,
generated additional forces towards a real appreciation. 12/ Second, and more
important, the coexistence of a fixed exchange rate and 100 percent indexed
wages made the adjustment required once capital inflows declined, extremely
difficult. The reason for this is that while the absorption of large amounts
of capital inflow requires a real appreciation, the reduction (or reversal) of
capital inflow requires a real depreciation to maintain equilibrium. As
reflected in Table 2, starting in late 1981 the rate of capital inflows
experienced a steep decline. Since the nominal exchange rate was fixed, the
adjustment of the real exchange rate required to cope with the lower rate of
capital inflows had to take place through a decline in the nominal price of
nontradable goods and of real wages. The problem, however, was that due to
the indexation mechanism incorporated into the labor law of 1979, real wages
were virtually inflexible downward. At this point it became apparent to most
observers that a fixed exchange rate and the real wages policy were highly
inconsistent, and that their coexistence represented a policy mistake. As
Sjaastad and others have indicated, these policies amounted to imposing two
mutually inconsistent numeraires in the economy. 13/ As a result of this
inflexibility in real wages, relative prices did not adjust. Instead, there

was a significant adjustment in quantities, with output and employment falling dramatically.

A traditional way to have solved the crisis, which was advocated by some analysts, was to devalue the peso. The purpose of this measure, of course, would have been to generate a real devaluation -- an improvement in the degree of competitiveness in the tradable goods sector required to reestablish equilibrium compatible with the lower rate of net capital inflows. However, due to the wage rate policy -- and in particular to the backward-looking indexation -- it is highly likely that the nominal devaluation would not have succeeded. As numerous historical experiences have indicated, when wages are 100% indexed, nominal devaluations will usually be fully translated into higher wages and prices, being self-defeating. In that regard, an appropriate policy package at this point in time would have included the simultaneous abandonment of the wage indexation scheme and of the fixed exchange rate system. The government, however reacted in a very different way. Between the second half of 1981 and the first half of 1982 a passive policy was followed. It was argued that the economy would automatically adjust to the new circumstances. 14/ In particular the economic authorities strongly rejected the idea of intervening in the labor and exchange rate markets. It was argued at the time that the macroeconomic adjustment would take place automatically and costlessly through higher interest rates, reduced expenditure and lower, and even negative, inflation. Interest rates did increase and inflation was somewhat reduced in the second half of 1981. The magnitude of the resulting adjustment, however, was clearly insufficient. The degree of real appreciation remained high and real interest rates climbed even faster. The level of domestic activity plummeted in

1982. The maintenance of a fixed exchange rate -- in conjunction with fully indexed wages -- constituted a policy mistake only at this time (1981-82), when the reduction in the level of capital flows required a real depreciation. Before late 1981, the fixed exchange rate did not constitute a serious mistake.

The interpretation of real exchange rate behavior between 1977 and 1982 presented in this paper relies heavily on the alleged existence of a negative effect of capital inflows on the real exchange rate; according to this view higher capital inflows will generate a real appreciation of the domestic currency. In order to investigate the extent of this relationship, a regression analysis was performed. Reduced form regressions using quarterly data for the period comprised between the first quarter of 1977 and the fourth quarter of 1982 were run. In addition to the (lagged) rate of net capital flows, other possible determinants of the real exchange rate like the terms of trade and real growth were also included in the regressions. The following results were obtained; where REER is the indexing of the real effective exchange rate and the numbers in parentheses are t-statistics: 15/

$$\log \text{REER}_t = 0.014 - 0.078 \log [\text{net capital flows}]_{t-1} + 0.798 \log \text{REER}_{t-1} \qquad (1)$$
$$(3.458) \quad (-3.801) \qquad\qquad\qquad (10.376)$$

$$R^2 = 0.897$$
$$D.W. = 1.887$$

$$\log \text{REER}_t = 0.016 - 0.076 \log [\text{net capital flows}]_{t-1}$$
$$(3.973) \quad (-3.521)$$

$$-0.218 \log [\text{terms of trade}]_{t-1} + 0.271 [\text{growth}]_{t-1}$$
$$(-1.935) \qquad\qquad\qquad (1.250)$$

$$+0.005[\text{devaluation dummy}]_t + 0.964 \log \text{REER}_{t-1} \qquad (2)$$
$$(0.194) \qquad\qquad (7.889)$$
$$R^2 = 0.946$$
$$\text{D.W.} = 1.753$$

As may be seen, under both specifications, the coefficient of the lagged value of net capital inflows is significantly negative as expected. However, the value of the coefficient is not very large, suggesting that it would take a significant change in the rate of capital flows -- as in Chile -- to generate large variations in the real exchange rate. 16/ It can also be seen from the results reported in equation (2) that the coefficients of the terms of trade variable is negative as expected. The coefficient for real growth, however, turned out to be positive and insignificant, suggesting that the Ricardo-Balassa effect did not play an important role in determining the behavior of the real exchange rate in Chile during this period. Finally the coefficient of the lagged dependent variable was fairly high under both specifications, indicating that after a shock the real exchange rate moved only slowly towards its new equilibrium. This is, in some sense, not surprising given that these regressions were run using quarterly data. In sum, the results presented here provide support to the hypothesis that the real exchange rate has been negatively affected by the rate of capital inflows in Chile.

One of the most important consequences of the real appreciation of the peso was that the tradable goods sector suffered an important loss of competitiveness, and that a large number of firms ran into serious financial trouble. Most of these firms faced these problems by resorting to heavy borrowing from the financial sector, exercising a significant pressure on the

demand for credit and on interest rates. As the magnitude of the real

appreciation increased, it became apparent for most economic agents that the

fixed exchange rate system was not sustainable. These beliefs fueled, towards

mid- and late 1981, expectations of a significant devaluation, which were

translated into even higher interest rates. In addition to the loss in

competitiveness generated by the real appreciation, the extremely high

interest rates and the depressed domestic demand, especially after 1981,

produced serious financial problems to most firms. 17/ The lack of government

supervision of the financial sector, and the close ownership relationship

between banks and large firms, made things even worse. In order to avoid the

firms' bankruptcy many banks made -- and rolled over -- loans that, from a

purely financial viewpoint, were highly questionable. 18/ As a result, the

portfolio of bad loans in Chilean banks grew dramatically between 1981 and the

end of 1982. Of course, these rolling-over operations were not sustainable,

and in early 1983 the financial sector collapsed. The most important banks

had to be rescued by the government, which in early 1985 directly or

indirectly controlled (or owned) more than 70 percent of the banking system.

II. MONETARY POLICY, EXPECTED DEVALUATION AND INTEREST RATES

Interest rate behavior constitutes one of the most fascinating

puzzles of the recent Chilean experience. Throughout the episode both nominal

and real interest rates were very high. In fact most analysts have pointed

out that the persistence of these high interest rates played a crucial role in

the 1982 crisis. 19/ Table 3 contains quarterly data on borrowing nominal

interest rates, inflation, foreign interest rates (LIBOR) and the rate of

devaluation for 1977 through 1983. A striking feature of these data is the fact that, even after the capital account was opened and the exchange rate was pegged against the dollar in June of 1979, there was a substantial differential between the domestic borrowing rates and the foreign (LIBOR) rate. Only a small fraction of this differential can be explained by the premium over LIBOR charged by the international financial community to Chilean borrowers. The average premium charged to loans obtained by Chile was 1.55 percentage points in 1978; 0.99 percentage points in 1979; 0.99 percentage point in 1980; 0.89 percentage points in 1981; and 0.97 percentage points in 1982. [20]/

The data on nominal interest rates presented in Table 3 refers to average borrowing rates from the banking system. Throughout the period lending rates were substantially higher. The spread between nominal lending and borrowing rates -- which averaged 22.7 percentage points in 1978, 22.4 percentage points in 1979, 9.4 percentage points in 1980, and 11.1 percentage points in 1981 and 18.2 in 1982 -- partially reflected the inefficiency of the Chilean banking system, which had a much higher cost of operations per unit of deposits than banks of comparable size in the U.S. and other industrialized countries. In Table 4 data on spreads between lending and borrowing rates between 1974 and 1983 are presented.

Until mid-1979, when the process of opening the capital account was begun, real interest rates were also extremely high. The real borrowing interest rate averaged 8.8 percent per annum in 1977, 18.9 percent per annum in 1978 and 13.2 percent per annum during the first half of 1979. The (partial) opening of the capital account and the resulting large inflows of foreign capital quickly impacted real interest rates; between the third

quarter of 1979 and the fourth quarter of 1980 borrowing real rates declined

significantly, averaging only 4.1 percent per annum. Towards the end of 1980

the situation drastically changed. In December of that year the real

borrowing rate climbed to 15 percent per annum, while the real lending rate

exceeded 20 percent per annum. Things became even worse in 1981, when the

real borrowing rate reached an annual average of 27 percent, and the real

lending interest rate averaged 37 percent. In the first half of 1982,

immediately preceding the devaluation of the peso, the real borrowing rate

averaged 37 percent, while the real lending rate reached the remarkable figure

of 43.3 percent.

Some possible explanations for the behavior of interest rates have

been offered. Sjaastad, for example, argues that regulations forbidding banks

to operate in funds denominated in foreign currencies introduced exorbitant

transaction costs. According to him these costs explain the extraordinarily

high and stable spread between interest rates for peso-denominated operations

and dollar-denominated operations. 21/ Harberger, on the other hand, has argued

that the existence of a strong and evergrowing "false demand" for credit

played a central role in the explanation of interest rate behavior. 22/ This

"false demand" consisted of the rolling-over of loans, which in turn, had

their origin in the privatization of a large number of firms (previously

nationalized during President Allende's government) during the early years of

the military regime. These firms were auctioned to private conglomerates that

had to spend significant resources in order to operate, modernize and expand

these companies. Many of these firms did not turn out to be profitable, and

increasingly resorted to additional borrowing in order to stay afloat. As

pointed out above, at the same time banks -- which had a close ownership

relation with the firms -- continued to roll over these loans in the hope that in this way their bankruptcy would be avoided. Of course, this whole operation was only possible due to the lack of supervision of the financial sector. 23/

Other observers have mentioned the role of expected devaluation and a higher country risk premium attached by the international financial community to Chile, as possible elements that would explain interest rate behavior. Still others have pointed out that the domestic monetary policy played a crucial role in the rapid increase of real rates experienced since late 1980. In particular, it has been argued that the so-called "neutral monetary" policy, which was an important ingredient of the "automatic adjustment" macro-economic approach followed by the economic authorities since late 1979, resulted in unnecessary upward pressures on the real interest rate. In connection to this it is usually mentioned that between the second quarter of 1980 and the fourth quarter of 1981 the real value of the monetary base declined by more than 18 percent. 24/ In this section a model that combines some of these explanations is presented and tested. Also, a number of analytical issues and lessons that emerge from this experience are raised.

II.1. Nominal Interest Rates

In this subsection an attempt to empirically explain the behavior of the nominal interest rate in Chile between 1977 and 1982 is made. Traditionally, empirical studies on nominal interest rates determination have made extreme assumptions regarding the degree of openness of the country under study. It has usually been assumed that the economy in question is either fully open to the rest of the world or that it is completely closed. These

extreme assumptions, of course, are not applicable to most developing countries, whose capital account is, in fact, subject to different types of controls. In that regard most developing economies, including Chile during the 1977-83 period, can be classified as semi-open economies.

A model for analyzing the process of interest rate determination in the context of semi-open economies as Chile has recently been proposed by Edwards and refined by Edwards and Khan. 25/ According to this model the behavior of the domestic nominal interest rate can be captured by the following set of equations:

$$i_t = \psi i_t^o + (1-\psi)i_t^c \qquad (3)$$

$$i_t^o = i_t^* + D_t^e + P_t \qquad (4)$$

$$i_t^c = r_t + \pi_t^e \qquad (5)$$

$$r_t = \rho - \lambda EMS_t + \omega_t \qquad (6)$$

$$EMS_t = \log m_t - \log m_t^d \qquad (7)$$

$$\log m_t^d = \alpha_0 + \alpha_1 \log y_t - \alpha_2(\rho + \pi_t^e) - \alpha_3 \pi_t^e \qquad (8)$$

$$\Delta \log m_t = \beta[\log m_t^d - \log m_{t-1}] \qquad (9)$$

where the following notation has been used:

i_t = nominal interest rate in the semi-open economy

i_t^o = nominal interest rate under the extreme assumption of fully open economy

i_t^* = foreign interest rate

D_t^e = expected rate of devaluation

P_t = risk premium

i_t^c = nominal interest rate under assumption of fully closed economy

r_t = actual real interest rate in period t

ρ = long-run real interest rate

π_t^e = expected inflation

EMS_t = excess supply for real money in period t

m_t = actual real money

m_t^d = quantity of real money demanded in period t

y_t = real income in period t

ω_t = random shock

and where ψ, λ, α and β are parameters.

Equation (3) states that the nominal interest rate in a semi-open economy can be expressed as a weighted average of the values it would take under the fully open and fully closed extremes. Parameter ψ measures the degree of financial openness of this economy; if $\psi = 1$ equation (3) collapses into the interest arbitrary condition for a fully open economy, given by equation (4). If, on the other hand, $\psi = 0$ equation (3) becomes equal to the Fisher closed equation (5). A value of ψ between zero and one reflects that this is a semi-open economy. The closer ψ is to one the more open this country will be to foreign influences on its financial sector. Equation (4) is the traditional interest arbitrage condition. It is assumed that under risk aversion there is a time varying risk premium term (P_t). Equation (6) states that the real interest rates will negatively depend on the situation of excess liquidity in the economy. With other things given, an excess supply for real money ($EMS_t > 0$) will exercise negative pressure, in the short run, on

the real interest rate. In the long run, however, EMS=0 and $r_t = \rho + \omega_t$.

Equation (8) is the demand for real money. Finally, equation (9) depicts the process through which monetary equilibrium is achieved.

Combining (3) through (9) the following expression form for the nominal interest rate in a semi-open economy is obtained:

$$i_t = \delta_0 + \delta_1(i_t^* + D_t^e) + \delta_2 \log m_{t-1} + \delta_3 \log Y_t + \delta_4 \pi_t^e + \delta_5 P_t + \varepsilon_t \tag{10}$$

where $\delta_1 \geq 0$, $\delta_2 \geq 0$, $\delta_3 \geq 0$, $\delta_5 \geq 0$ and $\delta_2 \leq 0$. 26/ The most important property of this expression is that it allows both open and closed economy factors to influence the domestic nominal interest rate in the short run. Indeed, the extremes of fully open or closed economies are particular cases of this equation. Moreover, the degree of financial openness of this country will be related to the value of δ_1. If $\delta_1 = 1$, and $\delta_2 = \delta_3 = \delta_4 = 0$ (10) becomes the open-economy interest arbitrage condition. In the Chilean case, however, it is expected that in a regression analysis both the coefficients of $(i_t^* + D_t^e)$, i.e., δ_1, and of $\log m_{t-1}$, i.e., δ_2, will be significantly different from zero; this would indicate that in Chile during the period under study both open-economy and closed-economy factors played an important role in the behavior of the nominal interest rate.

The estimation of equation (10) presents a number of problems. First data on the expected rate of devaluation have to be obtained. For the period between 1977 and June of 1979 this can be proxied by the actual rate of devaluation. 27/. Especially for the 1978 through mid-1979 period this is a fairly uncontroversial assumption, since the actual rate of devaluation was equal to the preannounced rate of devaluation determined by the tablita. On

the other hand, between July of 1979 and June of 1982, the actual rate of devaluation with respect to the U.S. dollar was zero. It is hard to argue, however, that during this period the <u>expected</u> rate of devaluation was also equal to zero. On the contrary, the available evidence indicates that the probability -- and expected magnitude -- of devaluation increased steadily throughout the period. For example, Le Fort has determined, using Bayesian methods, that the expected rate of devaluation increased from approximately 2 percent in July of 1979 -- one month after the parity was fixed -- to over 26 percent in May of 1982, just prior to the actual devaluation of June of that year. In this paper, and in order to test the relevance of the model presented above, the following simplifying assumption regarding the expected rate of devaluation during July 1979 and June 1982 was made: It was assumed that in every quarter the expected rate of devaluation can be proxied by the difference, in percentage points, between that quarter's effective real exchange rate and the effective exchange rate prevailing in the second quarter of 1979, when the peso was fixed to the dollar. This means, then, that it is assumed that the degree of real overvaluation of the peso relative to its June 1979 value provides a good proxy for the expected rate of devaluation.

Another problem related to the estimation of (10) has to do with the definition of a time series of the expected rate of inflation. In order to simplify the estimation π_t^e was replaced by π_t, the actual rate of inflation. This is a reasonable thing to do under the assumption of rational expectations. And finally, a third serious problem with the estimation of (10) is related to the risk premium term P_t. Ideally one would want to model this term, which will generally depend on the stock of outside assets of the government and on other variables affecting the degree of country risk. This,

however, was considered to be outside of the scope of this paper. Consequently it was assumed that P_t could be expressed as a constant k plus a serially correlated random term $\mu_t = \theta\mu_{t-1} + \nu_t$. This means that in the estimation of equation (10) a procedure that corrects for serial correlation should be used. Given the simplifying nature of these assumptions the results obtained from the estimation of (10) should be interpreted with caution.

In the regression a dummy variable that took the value of zero from 1977 to mid-1979 and the value of one form then onwards was introduced in order to allow for some distinction between the fixed and non-fixed rate subperiods. The estimation of equation (10) using quarterly data for period 1977 through 1982 and using OLS corrected for serial correlation, yielded the following results, where as before the numbers in parenthesis are t-statistics (see the Appendix for the exact data definitions and data sources):

$$i_t = 0.039 + 0.239(i_t^* + D_t^e) - 0.442 \log m_{t-1}$$
$$(0.418) \quad (1.965) \qquad\qquad (-2.030)$$

$$-0.153 \log y_t - 0.378\ \pi_t + 0.090\ \text{dummy} \qquad\qquad (11)$$
$$(-0.175) \qquad\quad (-1.130) \qquad (0.905)$$

$$R^2 = 0.905$$
$$DW = 1.932$$
$$N = 18$$
$$RHO = -0.378$$

These results are quite interesting. The fact that the coefficient of $(i_t^* + D_t^e)$ and of $\log m_{t-1}$ are significant at conventional levels and have

the expected signs, provides some support to the hypothesis that during the period under study the behavior of the nominal interest rate in Chile was influenced both by open economy factors and internal monetary conditions. This means that interest rate determination in Chile should indeed be modeled using a semi-open economy framework.

In spite of the estimation's shortcomings the results reported in equation (11) point out towards three basic factors in the explanation of nominal interest rates behavior in Chile: (1) nominal world interest rates; (2) expected devaluation; and (3) real liquidity. 28/ In fact, during 1981, while the world nominal interest rate and the expected rate of depreciation increased, real liquidity, in at least some of its definitions, drastically declined. These elements, then, provide an important guide for the understanding of nominal interest rate behavior in Chile. Further refinement of the model, however, should provide additional insights. In particular, a more detailed consideration of the determinants of the risk premium -- which now has been assumed to be equal to a constant plus an autoregressive term -- is a logical step towards the improvement of this model. Also, finding a better proxy for the expected rate of devaluation would result in improved estimates.

II.2 Real Interest Rates

Not only were nominal interest rates extremely high during the Chilean experiment, but real rates were also dramatically high. As mentioned, the partial opening of the capital account in mid-1979, and the resulting increase in the rate of (net) capital inflows, generated an important initial decline in real interest rates. This situation lasted for approximately 18

months, until November of 1980. Towards the end of that year, however, a sharp change was observed. During the year 1981, in spite of the fact that net capital inflows reached a record high, averaging more than 1.1 billion dollars per quarter, real interest rates experienced steep increases. The real borrowing rate was 22.9 percent in the first quarter of 1981, 26.3 percent in the second quarter, 27.9 percent in the third quarter and 32.8 percent in the fourth quarter.

What events can account for this abrupt change in the conditions in the financial market? Obviously, a number of factors can be mentioned, including the fact that this period coincided with the sharp increase in world real interest rates. Another explanation that has been advanced refers to the fact that in 1981 Chile's rate of inflation was significantly reduced. 29/ For a given nominal rate, the argument goes, a decline in inflation results in higher real interest rates. While this reasoning is evidently (tautologically) correct, it is clearly incomplete. In fact, it begs the question on why wasn't the decline in inflation in 1981 accompanied by an equiproportional drop in nominal rates? The discussion on the behavior of nominal rates presented in the preceding section provides a partial answer to this. While inflation finally came down in 1981 to the level of world inflation, at that time it became apparent that the prevailing rate of capital inflows was not sustainable in the long run. This resulted in significant expectations of devaluation which positively impacted the nominal interest rate without affecting inflation in an equiproportionate way.

An approach similar to that used to discuss the behavior of the nominal rate can be used to focus the analysis on the behavior of the real rate. Consider equations (12) through (14).

$$r_t = \theta r_t^o + (1-\theta)r_t^c \tag{12}$$

$$r_t^o = r_t^* + \dot{e}_t \tag{13}$$

$$r_t^c = \rho - \lambda EMS_t + \omega_t \tag{14}$$

Where r_t is the real rate in this semi-open economy, r^o is the real interest rate that would prevail in the extreme case of a fully open economy, and r_t^c is the real rate under the other possible extreme -- completely closed economy. θ is a parameter, equivalent to ψ in equation (3), related to the degree of openness of this economy. If $\theta=1$, equation (12) becomes equal to the open economy extreme (13); if $\theta=0$ the fully closed economy equation results. In the case of a semi-open economy, however, one would expect θ to be between zero and one. In equation (13) $\dot{e}_t$ is the expected change in the real exchange rate. The real exchange rate, in turn, is defined as $e = EP^*/P$, where E is the nominal exchange rate, P^* is the foreign price level and P is the domestic price level. Equation (14), which is the real rate equivalent to equation (6) above, is the actual real rate of interest in period t. Equation (13) is of particular interest and relevance for this discussion. 30/ It states that even under a completely open economy, with full capital mobility, real interest rates need not be equal. Moreover, according to this term if a real depreciation is expected (i.e., $\dot{e}_t > 0$) the domestic real interest rate will exceed the world interest rate. Equations (12), (13) and (14) can be combined to obtain an expression that provides some insights for the understanding of the behavior of the real interest in Chile between late 1980 and mid-1982:

$$r_t = \theta r_t^* + \theta \dot{e}_t - (1-\theta)\lambda EMS_t + (1-\theta)\rho + \varepsilon_t \tag{15}$$

According to this equation the domestic real interest rate can increase for three reasons: (1) a higher world real interest rate; (2) a higher expected rate of _real_ depreciation; and (3) the creation of a situation of excess demand for real liquidity in the economy ($EMS_t < 0$). All three elements were simultaneously present in 1981-82. First, the world real interest rate -- measured as the difference between LIBOR and the US CPI inflation -- increased by more than 7 percentage points between 1980 and 1981. Second, as Le Fort has recently established, there is no doubt that starting in late 1980 and during most of 1981 the expectations of a real devaluation increased dramatically. 31/ These expectations were fueled both by the generalized feeling that the external situation regarding capital inflows was not sustainable and by the fact that in 1981 the terms of trade began to turn dramatically against Chile. Between 1980 and 1981 the effective real exchange rate further appreciated by 12 percent. Finally, as pointed out in Section II, starting in 1981 there was a large increase in the demand for real liquidity, stemming (partially) from the bank's decision to roll over their bad loans as a way to avoid (or more accurately, postpone) firms' bankruptcy.

III. MONETARISM NOW AND THEN: THE KLEIN-SAKS MISSION VS. THE MILITARY REGIME

In this section the military government approach towards stabiliza-tion is compared to the only other sustained monetarist-type stabilization program undertaken in Chile, during 1955-57. This comparison focuses mainly on the implications of the two different programs for real exchange rate behavior. The comparison of both episodes provides interesting insights

regarding the evolution through time of monetarist thinking in Chile and Latin
America. Both experiments had a number of elements in common, and also some
key features that were radically different. In fact this comparison turns out
to be quite instructive.

In 1955 inflation in Chile had reached what at the time was
considered to be an extraordinarily high level -- 84 percent. The government
decided to seriously tackle the problem by implementing a long-term consistent
stabilization program. For this purpose a New York-based consulting firm was
hired, and in 1955 the Klein-Saks Mission began its work. The mission's terms
of reference stated that it should evaluate the causes of inflation and
external disequilibrium, and recommend a set of policies to combat these
problems. The approach taken by the mission can undoubtedly be labeled as
monetarist. It (correctly) traced the main cause of inflation to money
creation to finance the fiscal deficit, and recommended a package of monetary-
type policies that would work towards eliminating the underlying roots of
inflation. The mission's program was a qualified success. By 1957 the rate
of inflation had declined to 17 percent; the balance of payments had improved
and fiscal finances were in better shape. All in all, given the existing
political constraints, it is possible to state that the mission's achievements
were quite significant.

The similarities between the Klein-Saks Mission program and the
military program mainly refer to the diagnosis of the causes generating
inflation and the external crisis. Even though the initial conditions were
much worse in 1973 than in 1955, both programs correctly pointed out that the
creation of money to finance the fiscal deficit was the main cause of the
ongoing inflation. Both programs also emphasized Chile's weak external

position and the inability of the public sector to efficiently mobilize
resources for investment purposes. 32/

   The two stabilization programs also had some important differences.
Two of them are worth pointing out within the context of the present paper.
First, contrary to the Klein-Saks program, one of the main features of the
military experience is that after the initial period, the stabilization
program not only focused on the traditional short-run anti-inflationary
elements present in any orthodox IMF-type of program, but also emphasized
long-run institutional reforms, whose purpose was to drastically reduce the
government's role in the economy. Towards the late 1970s, the so-called
"modernization reforms," which introduced important structural changes, became
an integral part of the long-run development program, with most of these
reforms having actually been carried out by the end of 1981. 33/

   A second major difference between both monetarist experiences refers
to the framework used for formulating the stabilization programs. While the
Klein-Saks experience was basically based on a closed-economy view of the
world, the new monetarism postulated that, after the trade reform, Chile was
an open economy subject to external shocks. The military stabilization
program was highly influenced by the simplest version of the monetary approach
to the balance of payments. In particular, there was great faith that in a
small open economy the different parity conditions would hold, even in the
short run. In fact, it was the belief that in an open economy the domestic
rate of inflation rapidly converges to the world rate of inflation (plus
expected devaluation) that prompted the economic authorities to base the
stabilization programs on the preannouncement of the rate of devaluation. As
a culmination of this policy the peso was fixed to the U.S. dollar in June of

1979. However, this experience showed, once again, that the purchasing power parity condition does not hold in the short run; for several years the domestic rates of inflation were significantly higher than the rate of world inflation plus the rate of devaluation. As already argued, this plus the opening of the capital account resulted in a major real appreciation of the domestic currency, and in a significant loss of competitiveness of the domestic sector. The situation was aggravated by the adoption of a 100 percent wage indexation law in 1979. Towards late 1981, when capital inflows were substantially reduced, the adjustment of the economy required, a real devaluation of the peso and a reduction of real wages, which were precluded by the existing institutional arrangements, including the fixed exchange rate and the indexation scheme. As a result, there was a significant adjustment in quantities, with output and employment falling dramatically.

More specifically, the two experiences differed significantly with respect to the (proposed) exchange rates and wage rate policies. As has already been pointed out repeatedly, the military program opted for a fixed exchange rate and fully indexed wages with respect to past inflation. Regarding these two specific policies the Klein-Saks Mission made very different policy recommendations. The following quotations from the Mission's report clearly illustrate this point: 34/

"[T]he Mission has held that automatic and obligatory readjustments of salaries and wages are an important contributing factor in the inflation. The Mission...advocated using wage policy as one of several elements in reducing the rate of...price increases. The eventual objective of this policy was seen in the restoration of freedom of wage negotiations..."   (page 10)

Regarding exchange rates policy the Mission recommended:

"The Mission's concrete recommendations were based on the desirability of
establishing a single flexible exchange rate for all merchandise
transactions...While a free market for capital transactions was to be
maintained..."   (pages 11 and 12)

The suggestion of a dual exchange rate system, which differentiates
between financial and current external transactions is particularly
interesting in the light of the events of 1979-82, where the massive capital
inflows resulted in a steep real appreciation of the peso. In principle, this
kind of exchange rate arrangement tends to isolate the real side from real
exchange rate movements originated in the financial side of the economy. In
that regard under this type of arrangement the real appreciation resulting
from the liberalization of the capital account would have a reduced effect on
the real side of the economy. 35/

After comparing the stabilization programs of the Klein-Saks Mission
and of the military regime one is tempted to argue that if (regarding exchange
rates and wage rates) the monetarists of the 1970s had applied the policies of
the monetarists of the 1950s, the magnitude of Chile's current economic
problems would have been less severe.

IV. CONCLUDING REMARKS

What went wrong in Chile? This is a question with vast policy
implications for developing countries. In the 1970s Chile adopted a set of
policies advocated for a long time by mainstream economists for developing

countries. For a while things worked out well and a number of experts believed that Chilean approach would become the norm that developing countries would try to emulate. 36/ In 1982, however, the experiment collapsed.

A number of things went wrong. However, it can be argued that the crisis of the Chilean economy was not directly the consequence of the more basic liberalization reforms. For example, it is clear that the collapse of 1982 was not related in any direct way to the fiscal reform of 1975, or to the tariff liberalization carried out between 1975 and 1979, or to the reform of the social security system. On the other hand, there is little doubt that the way in which the financial reform was carried out -- basically with no supervision of the financial sector -- played a major role in determining the magnitude of the crisis. Also, the timing of the opening of the capital account of the balance of payments in 1979/80 -- which generated wide swings in the real exchange rate -- was ill conceived.

It is in the sphere of macroeconomic management where the more serious mistakes took place. In that respect, the reliance on an "automatic monetary adjustment" towards late 1981 was particularly harmful. Also, the combination of a fixed exchange rate with fully indexed wages created important policy inconsistencies, which became particularly serious in late 1981 when the rate of capital flows dramatically dropped. It should be' recognized, however, that foreign factors including the world recession and the drastic reduction in Chile's terms of trade between 1980 and 1982. Another area where the government policies were particularly deficient refers to the capital accumulation process. Throughout the period savings and investment was very low; in fact lower than its level in the 1960s. In that regard it was quite apparent from the early stages of the economic recovery

that the growth pace of 1977-80 was not sustainable in the medium and long
run.

APPENDIX

Data Sources for Regression Analysis

Terms of Trade: Defined as price of exports relative to imports. The data were obtained from Universidad de Chile.

Net Capital Inflows: Data obtained from Guillermo Le Fort, "The Real Exchange Rate and Capital Flows: The Case of the Southern Cone Countries." Unpublished Ph.D. dissertation, University of California, Los Angeles.

Interest Rates (i_t): Nominal borrowing rates paid by banks. Data obtained from various issues of the Boletin, Banco Central de Chile.

Inflation: Rate of change of consumer price level as corrected by Cortazar and Marshall for 1975-79. For other years, data obtained from Banco Central de Chile.

Exchange Rate: Data obtained from Banco Central de Chile.

Output: Quarterly data obtained from Universidad de Chile.

FOOTNOTES

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1/ The stabilization and reform attempts of the 1970s were carried out by a group of economists popularly known as the "Chicago boys." On the Chilean economy until 1970 see, for example, Jere Behrman, Foreign Trade Regimes and Economic Development (Cambridge, Mass.: Ballinger, 1976) and Ricardo Ffrench-Davis, Politicas Economicas en Chile 1952-70 (Santiago: Ediciones Nueva Universidad, 1973). For analyses of the Chilean economy during the military regime see, for example, Jose P. Arellano et al, Modelo Economico Chileno: Trayectoria de una Critica (Santiago, Editorial Aconcagua, 1982); Sebastian Edwards, "Stabilization with Liberalization: An Evaluation of Ten Years of Chile's Experiment with Free Market Policies: 1973-83," Economic Development and Cultural Change 33 (January 1985): 223-54; "Economic Policy and the Record of Economic Growth in Chile 1973-82" in G. Walton (ed.), National Economic Policies in Chile (Greenwich and London: JAI Press, 1985); Bela Balassa, "Policy Experiments in Chile" in G. Walton (ed.), National Economic Policies in Chile (Greenwich and London: JAI Press, 1985); and Alejandro Foxley, Neo-Conservative Economics in Latin America (Berkeley, Los Angeles and

London: University of California Press, 1983); Arnold Harberger,

"Observations on the Chilean Economy 1973-83," Economic Development and

Cultural Change 33 (April 1985): Vittorio Corbo, "Recent Macroeconomic

Developments in Chile," World Development (August 1985).

2/ See footnote 1. Note that this paper does not address other important

issues related to the reform attempt, including the tariff liberalization,

the income distribution problem, the unemployment problem and the

investments-savings process. On these issues see Edwards, "Stabilization

with Liberalization..."

3/ Arnold Harberger, "The Chilean Economy in the 1970s: Crisis

Stabilization, Liberalization, Reform" in K. Brunner and A. Meltzer (eds.)

Economic Policy in a World of Change (Amsterdam: North-Holland Publishing

Co., 1982).

4/ In June of 1979 the nominal exchange rate was fixed at 39 pesos per U.S.

dollar. This was the culmination of a process of preannouncing the rate

of devaluation of the exchange rate begun in early 1978. On the alleged

role of the exchange rate pegging on the crisis. See, for example, World

Bank, Chile: An Economic Memorandum (Washington, D.C., 1984); Juan Andres

Fontaine, "Crecimiento, Recesion y Mercado," Estudios Publicos 11 (March

1983): 73-91; Ricardo Ffrench-Davis, "The Monetarist Experiment in

Chile," World Development 11 (November 1983): 905-26; and Guillermo

Le Fort, "The Real Exchange Rate and Capital Flows: The Case of the

Southern Cone Countries," Ph.D. Dissertation, University of California,

Los Angeles, 1985.

5/ It should be noted that between 1973 and 1975 a very sharp real

depreciation took place. See Harberger, "The Chilean Economy in the

1970s."

6/ During this period the nominal exchange rate with respect to the U.S.

dollar was devalued by 135 percent.

7/ Throughout the experiment capital inflows were subject to a number of

controls. For example, there was a minimum maturity for loans to come in

freely (66 months). Loans of shorter maturities were subject to very high

reserve requirements. On this see Edwards, "Stabilization with

Liberalization;" Harberger, "Observations on the Chilean Economy;" and

Corbo, "Recent Macroeconomic Developments..."

8/ This follows from the traditional "transfer problem" in international

economics. See Rudiger Dornbusch, "External Debt, Budget Deficits and

Disequilibrium Exchange Rates" in G. Smith and J. Cuddington (eds.)

International Debt and the Developing Countries (Washington, D.C.: The

World Bank, 1985); Harberger, "The Chilean Economy...;" Edwards,

"Stabilization with Liberalization...;" and Timothy Condon, Vittorio Corbo

and Jaime de Melo, "A Simulation Analysis of the Macroeconomic Effects of

Capital Inflows and Wage Indexation in Chile 1977-81," DRD Working Paper

No. 108 (Washington, D.C.: The World Bank, 1984) where a simulation model

is used to conclude that capital inflows (treated like transfers) played

an important role in the process of real exchange rate appreciation. See

also Maurice Obstfeld, "Capital Flows, the Current Account and the Real

Exchange Rate: Consequences of Liberalization and Stabilization;" S.

Edwards and L. Ahamed in Economic Adjustment and Exchange Rates in

Developing Countries, forthcoming, 1986.

9/ In fact preliminary computations indicate that under a floating exchange

rate, in mid-1981 the nominal exchange rate would have been approximately

30 pesos per dollar.

10/ Larry Sjaastad, "The Failure of Economic Liberalism in the Southern Cone" (March 1983). Attempts to explain econometrically the behavior of the net rate of capital flows in Chile during 1977-1981 didn't produce significant results. The regressions, available from the author on request, indicate that the rate of capital was not sensible during the period to uncovered interest rate differentials. Also, given the segmentation that existed in the financial market, at every moment in time there was an excess demand for credits denominated in foreign exchange.

11/ For an extensive discussion on the subject, see Sebastian Edwards, The Order of Liberalization of the External Sector in Developing Countries, Princeton Essays in International Finance No. 156 (December 1984). See also Ronald I. McKinnon, "The International Capital Market and economic Liberalization in LDCs," The Developing Economies 22 (December 1984): 476-81.

12/ The decision to peg the peso the U.S. dollar in 1979 was based on the belief that this will result in a rapid reduction of Chile's inflation towards a level comparable to the world rate of inflation. Carlos Diaz-Alejandro, "Southern Cone Stabilization Plans" in W. R. Cline and S. Weintraub (eds.) Economic Stabilization in Developing Countries (Washington, D.C.: Brookings Institution, 1981) discusses this issue. On the relationship between domestic inflation, world inflation and the rate of devaluation in developing countries, see Sebastian Edwards, "More on Purchasing Power Parity: A Multi-Country Analysis of the LDCs' Case," Working Paper, Department of Economics, University of California, Los Angeles, 1985.

13/ Larry Sjaastad, "The Failure of Economic Liberalism." See also Vittorio

Corbo and Sebastian Edwards, "El Rol de una Devaluacion en la Economia

Chilena Actual," Working Paper, Departamento de Estudios BHC (Santiago,

Chile, 1981), Vittorio Corbo, "Recent Macroeconomic Developments" and

Sebastian Edwards, "Stabilization with Liberalization."

14/ See Sergio de Castro, "Exposicion de la Hacienda Publica, 1981" (Santiago,

Ministerio de Hacienda, 1981).

15/ D.W. is the Durbin-Watson statistic; R^2 is the coefficient of determina-

tion. These regressions were run correcting for the existence of first

order autocorrelation. Note that since lagged right-hand side variables

are used, no simultaneity problems arise from the estimation reported

here. The devaluation dummy in equation (2) takes a value of one in June

of 1979 and March of 1982, and zero otherwise. On the relationship

between real exchange rate changes and its theoretical determinants, see

Sebastian Edwards, "Exchange Rates in Developing Countries," Working

Paper, University of California, Los Angeles, 1985. See also Carlos Diaz-

Alejandro,"Latin America Debt: I Don't Think We in Kansas Any More,"

Brookings Papers on Economic Activity 2 (1984): 335-404. See Guillermo

Calvo, "Fractured Liberalism," Economic Development and Cultural Change

(this issue) for an analysis of the Argentinian experience.

16/ These results are in agreement with the simulation findings reported in

Condon, Corbo and de Melo, "A Simulation Analysis..."

17/ The devaluations of 1982 were a mixed blessing for most firms. On one

hand, they saw an improvement in their degree of competitiveness. On the

other hand, since they had incurred a significant dollar-denominated debt,

the peso value of their liabilities greatly increased. This situation was

Economy in the 1970s."

partially solved by the government decision to establish a preferential
exchange rate to pay debts denominated in foreign currency.

18/ See also Julio Galvez and James Tybout, "Microeconomic Adjustment in
Chile: The Importance of Being a Group," World Development (August 1985)
for a detailed analysis of the interaction between banks and bank-related
firms.

19/ See Harberger, "Observations on the Chilean Economy;" Corbo, "Recent
Macroeconomic Developments;" Dornbusch, "External Debt, Budget Deficits
and Disequilibrium Exchange Rates;" and Edwards, "Stabilization with
Liberalization..."

20/ These figures refer to loans received by the banking sector; see Boletin
Mensual del Banco Central de Chile. See Sebastian Edwards, "LDCs' Foreign
Borrowing and Default Risk. An Empirical Analysis, 1976-80," American
Economic Review 74 (September 1984): 726-34, for an empirical analysis of
the determinants of the spread over LIBOR for a group of developing
countries in the period 1976-80.

21/ Sjaastad, "The Failure of Economic Liberalism."

22/ Harberger, "Observations on the Chilean Economy."

23/ Harberger stresses this point in "Observations on the Chilelan Economy."
See also Sebastian Edwards, "Review of Foxley's 'Latin American
Experiments in Neoconservative Economics,'" Journal of Development
Economics (forthcoming). Galvez and Tybout, "Microeconomic Adjustment in
Chile," provide empirical evidence on this.

24/ See, for example, Fontaine, "Crecimiento, Recesion y Mercado." It should
be pointed out, however, that the different definitions of real money
behaved quite differently throughout the period. See Edwards, "Interest

Rates and Money in a Semi-Open Economy: Chile 1975-81," Working Paper, University of California, Los Angeles, 1982 and Harberger, "The Chilean Economy in the 1970s."

25/ Sebastian Edwards, "Money, the Rate of Devaluation and Interest Rates in a Semi-Open Economy," Journal of Money, Credit and Banking 17 (February 1985): 59-68 and Sebastian Edwards and Mohsin Khan, "Interest Rate Determination in Developing Countries: A Conceptual Framework," IMF Staff Papers (September 1985).

26/ See Edwards and Khan (1984) for the exact expressions of the δs in terms of the structure parameters of equations (3) through (9).

27/ James Hanson and Jaime de Melo, "External Shocks, Financial Reforms and Stabilization Attempts in Uruguay during 1974-83," World Development (August 1985) also make this assumption in their study on Uruguay.

28/ Hanson and de Melo reached similar conclusions in their analysis of interest rate behavior in the case of Uruguay. See, however, Blejer and Gil-Diaz, "The Effects of Domestic and External Factors on the Determination of the Real Interest Rate: The Case of Uruguay," Economic Development and Cultural Change (this issue).

29/ See Sjaastad, "The Failure of Economic Liberalism."

30/ Equation (13) can be derived by combining the uncovered interest condition and the Fisher equation for the domestic and foreign countries.

31/ Le Fort, "The Real Exchange Rate and Capital Flows..."

32/ On the Klein-Saks Mission, see "The Chilean Stabilization Program and the Work of the Klein and Saks Economic and Financial Mission to Chile" (Santiago, Chile, May 1958).

33/ See the analysis in Foxley, "Latin American Experiments in Neoconservative Economics." There is little doubt that the implementation of the more drastic of these reforms -- including the labor law of 1979, the mining law and the privatization of the social security system -- could only be carried out because the democratic process had been suspended. It is highly unlikely that these (and other) reforms would have been approved by a democratically elected congress.

34/ See "The Chilean Stabilization Program and the Work of the Klein and Saks Economic and Financial Mission to Chile."

35/ On the role of dual exchange rates for separating the capital and current accounts, see Rudiger Dornbusch, "Exotic Exchange Rate Adjustments," Paper presented at the NBER/World Bank Conference on Structural Adjustment and Real Exchange Rates in Developing Countries.

36/ For example, Ronald McKinnon States in his "The Order of Economic Liberalization: Lessons from Chile and Argentina" in K. Brunner and A. Meltzer (eds.) Economic Policy in a World of Change (Amsterdam: North-Holland, 1982) that "The correct order of liberalization...approximates the successful Chilean experience after 1975. Chile is to be treated as the norm or standard of reference" (page 159).