DISCUSSION PAPER

DRD132

THE USE OF THE EXCHANGE RATE FOR STABILIZATION PURPOSES:
THE CASE OF CHILE

by

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World Bank
and
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August 1985

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Abstract

The purpose of this paper is to evaluate the role of the pre-announced exchange rate policy in the recent macroeconomic evolution of Chile. Three effects of the policy are analyzed: that on inflation dynamics and the real exchange rate; that on capital flows and aggregate expenditures; and that on the macroeconomic evolution in the period 1978-82.

Three main conclusions can be drawn from Chile's experience. First, the liberalization and stabilization reforms implemented during the early years of the military government, in spite of the unfavorable external shocks of 1975, succeeded until late 1978, except that the rate of unemployment and real interest rate remained stubbornly high.

Second, the second stabilization attempt, undertaken when inflation was down to 35% a year -- a level similar to the average for the 1960s -- worked at cross-purposes with the export-led growth being generated by the liberalization of trade. Indeed, the use of the exchange rate to stabilize the economy created not only a temporal short-term real appreciation of the peso, it also encouraged external borrowing at a time when the restrictions on capital inflows were being lifted and the capital markets were very liquid.

Third, contrary to what the authorities thought, the large spread between the domestic and foreign interest rates was as much a problem of imperfect asset substitution as it was a problem of control of the inflows of capital. Thus the intensity of the opening up of the capital account should not have been governed chiefly by the spread in interest rates.
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# Table of Content

<table>
<thead>
<tr>
<th>Section</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>II. Initial Conditions and Main Policy Reforms</td>
<td>3</td>
</tr>
<tr>
<td>III. Devaluation, Inflation and the Real Exchange Rate</td>
<td>9</td>
</tr>
<tr>
<td>IV. Exchange Rate Preannouncement, Portfolio Adjustment and the Endogeneity of Capital Inflows</td>
<td>13</td>
</tr>
<tr>
<td>V. The Macroeconomic Effects of the Preannouncement Policy</td>
<td>20</td>
</tr>
<tr>
<td>VI. Conclusions</td>
<td>28</td>
</tr>
<tr>
<td>Appendix: Principal Reforms: Chronological Synthesis</td>
<td>30</td>
</tr>
<tr>
<td>Commercial Policy</td>
<td>30</td>
</tr>
<tr>
<td>Price Liberalization</td>
<td>30</td>
</tr>
<tr>
<td>Labor</td>
<td>31</td>
</tr>
<tr>
<td>External Capital Markets</td>
<td>31</td>
</tr>
<tr>
<td>Domestic Financial Markets</td>
<td>33</td>
</tr>
<tr>
<td>Foreign Exchange Policy</td>
<td>34</td>
</tr>
<tr>
<td>References</td>
<td>35</td>
</tr>
<tr>
<td>Tables:</td>
<td></td>
</tr>
<tr>
<td>1. Annual Macroeconomic Indicators, 1960-82</td>
<td>4</td>
</tr>
<tr>
<td>2. Quarterly Indicators</td>
<td>6</td>
</tr>
<tr>
<td>Figures:</td>
<td></td>
</tr>
<tr>
<td>1. The Effect of a 50% Devaluation</td>
<td>11</td>
</tr>
<tr>
<td>2. Real Exchange Rate (1977 = 100)</td>
<td>12</td>
</tr>
<tr>
<td>3. Net Private Quarterly Capital Flows</td>
<td>17</td>
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I. Introduction

The purpose of this paper is to evaluate the role of the pre-announced exchange rate policy in the recent macroeconomic evolution of Chile. Three effects of the policy are analyzed: that on inflation dynamics and the real exchange rate; that on capital flows and aggregate expenditures; and that on the macroeconomic evolution in the period 1978-82.

The paper has four main theses. First, the policy of a preannounced exchange rate, with a rate of crawl substantially below previous inflation, is bound to result in a lengthy period of (at least temporal) real peso appreciation. The real appreciation period is even longer for an economy with 100%-plus wage indexation, as was the case in Chile in the period 1979-82. Second, with respect to the asset markets, the preannouncement policy, by causing a substantial drop in the peso cost of foreign borrowing, should result in a drop in domestic interest rates. Third, a wealth effect should result from the decrease in the value of private foreign debt in terms of non-tradables and the appreciation of real assets. This wealth effect plus the decrease in the interest rate should yield in a large increase in expenditures. Fourth, the deficit on the current account results mostly from the real peso appreciation and the increase in expenditures. Given a deficit in the current account and the evolution of domestic credit, capital inflows will adjust to equilibrate the asset markets. Thus, the capital inflows were endogenous during the period of appreciation in Chile. In this paper we present strong econometric evidence for hypotheses one and four and some supporting evidence for hypotheses two and three.

The rest of this paper is organized as follows. Section II provides some background on the conditions before the military government took power...
and the main policies it implemented. Section III provides evidence on the
effect of the preannounced policy on the real exchange rate and the dynamic of
inflation. Section IV gives evidence on the endogeneity of capital flows,
using a model with imperfect assets substitution for a period in which the
Central Bank did not practice stabilization of the monetary effects of capital
flows. Section V discusses the macroeconomic implications of the preannounced
policy. Section VI presents the main conclusions. An appendix provides
information on the chronology of the main reforms.
II. Initial Conditions and Main Policy Reforms 1/

The military government that took power in 1973 had to contend with an economy suffering from widespread distortions and the worst inflation in Chile's history (Table 1). The fiscal deficit was close to 25% of GDP, and net foreign reserves were negative. Only by virtue of widespread price controls was inflation kept even moderately in check. Indeed, when the price controls were partially lifted in late 1973, inflation skyrocketed to 1,000% on an annual basis.

Given this situation, the military government spent its first two years in power trying to stabilize the economy. To eradicate the monetization of the fiscal deficit, it introduced a major tax reform in 1974 and implemented large reductions in government expenditures both in 1974 and 1975. The sale of government assets inherited from the Allende years further reduced the need for monetization of the fiscal deficit. Good prices for copper in 1974 and a rollover of 30% of outstanding debt service for 1973 and 1974 also eased the adjustment to the first oil shock.

Still, by late 1974 and early 1975 the external crisis had become increasingly apparent -- copper prices dropped almost 50% with respect to their 1974 value, while the price of oil stayed at four times its 1973 value. These exogenous factors forced the government to undertake a major devaluation and a severe austerity program.

After controlling for the emerging external crisis, in the period 1975-79 Chile implemented one of the most sweeping economic reforms in its economic history. In the first two years in office, the government lifted all

1/ For a chronology of the three reforms, see the appendix.
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ANNUAL MACROECONOMIC INDICATORS, 1960-82

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<th>Non-Tradable 2/</th>
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<th>Absorption 3/</th>
<th>GDP Deflator 4/</th>
<th>CPI Rate 5/</th>
<th>Unemployment 4/</th>
<th>Price of Copper 6/</th>
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Note: The rate of change for columns (1) to (4) was computed from raw data at 1977 prices.
1/ Includes agriculture, fishing, mining and manufacturing.
2/ Includes construction and services.
3/ Includes private consumption, public consumption and total investment.
4/ Greater Santiago.

Sources: Columns (1) to (5), Cuentas Nacionales de Chile 1960-1982, Central Bank.
quantitative restrictions on trade and started a trade reform that reduced the tariffs, which had ranged from 0% to 750% in the Allende years, to a uniform 10% rate by July 1979. It also lifted all commodity price controls, and removed the constraints on domestic interest rates by June 1975. In addition, early in its administration, the military government unified the multiple exchange rate system and instituted a crawling peg targeted to achieve a fairly stable real exchange rate. There was little liberalization in two areas, however. One was labor policy. Although the labor markets were deregulated de facto by the loss of trade union power in the year following the military coup, most of the restrictive labor legislation inherited from previous governments was modified only slowly. One major reform, however, was the introduction of a compulsory 100% backward wage indexation starting in October 1974. Moreover, a new labor code introduced in July 1979 reestablished collective bargaining, albeit for just a fraction of the labor force, and mandated that the lowest offer employers could make had to equal the previous wage adjusted by inflation as measured by the CPI. The second area where there was no clear liberalization policy was capital inflows.

In the face of these measures, following the strong recession in 1975, GDP grew at an annual rate of close to 10% in the period 1976-77, while the unemployment rate dropped to 13.2% in 1977, a level that was, however, still substantially above historical levels. The real rate of interest for loans in pesos was 45.4% a year in 1977 (Table 2, col. 9). The inflation rate fell substantially below the 1973-74 level, but was still close to 100% a year.

1/ For a review of the indexation, see Edwards, A. (1985).
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1/ Columns (1) to (6) in millions of dollars.
2/ This column sums up net capital inflow (article 14) plus short-term capital movements through the banking system.
3/ POS value.
4/ The annualized expected rate of inflation and devaluation were assumed to be equal to
   \[ \left(1+\epsilon_t\right)\left(1+\epsilon_t+1\right)^{12} \] and \[ \left(1+\epsilon_t\right)\left(1+\epsilon_t+1\right)^{12} \] respectively,
   where \( \epsilon_t \): Period t inflation
   \( \epsilon_t \): Period t devaluation.

In the initial years of its rule, the military government attacked inflation by controlling the growth of money. However, by early 1977, by which time Chile's economy had been opened to trade significantly, a debate developed within the government on the causes of inflation and the most appropriate way to deal with it. As early as June 1976, a 10% revaluation was implemented as a way to decrease inflation and sterilize part of the reserve accumulation. In March 1977, a further 10% revaluation was undertaken for the same purpose. Toward the end of 1977 the government announced that the rate of devaluation was going to be targeted to exceed the rate of inflation to compensate the import-competing sector for the announced tariff reductions. Surprisingly, however, a preannounced devaluation schedule, with the devaluations to proceed at decreasing rates, was introduced in February 1978. The initial rate of devaluation was substantially below the previous months' inflation. Then in late 1979 the government introduced the aforementioned labor policy of full retroactive compensation for inflation for workers who negotiated collectively, even though less extensive indexation based on full compensation for past inflation had existed since late 1974. The prices of many non-tradables, such as housing rent, school fees, mortgage payments, public utility tariffs and the like, had also been fully indexed backward for some time.

Three goals had been behind the introduction of the preannounced exchange rate system with a decreasing rate of devaluation. First, it was believed this policy would reduce the expected rate of inflation in a small country like Chile, which by then had become an open economy. Second, the new system was supposed to put downward pressure on the rate of increase in the price of tradables and thus help lower the stubborn inflation. Third, this
Policy was supposed to lead to a further integration of the capital markets and reduce domestic interest rates by reducing the expected rate of devaluation. It was also assumed, when the preannounced policy was formulated, that domestic inflation would converge rapidly with the rate of international inflation (plus the rate of devaluation). Thus, the competitiveness of the tradable-producing sectors would not suffer much (Blejer and Mathieson, 1981; McKinnon, 1980; and Dirección de Presupuestos, 1977 and 1978).
III. Devaluation, Inflation and the Real Exchange Rate

Corbo (1985a) studies inflation during this period using a dynamic model. The model contains three groups of goods: homogeneous tradables (agricultural commodities), differentiated tradables (manufacturing goods) and non-tradables. For homogeneous tradables, the model assumes that the law of one price applies. For differentiated tradables and non-tradables, the price equations include both cost and demand variables. Furthermore, the pricing of the differentiated tradables is also a function of the price of similar imports. As to wages, Phillips curves were augmented by inflation for both the differentiated tradable and non-tradable sectors. The model is rounded out with two definitions. The price used for tradables is a geometric average of the price of homogeneous and differentiated tradables, while the CPI is a geometric average of tradable and non-tradable prices.

In the complete model, a devaluation under conditions of full price homogeneity does not affect the relative prices between tradables and non-tradables. A test for homogeneity of the whole system found that the null hypothesis was rejected. This rejection originated in the non-homogeneity of the wage equation for non-tradables. Thus, in the Chilean economy of 1982, a devaluation could have improved the real exchange rate.

More important than the rejection of full homogeneity is the finding that inflation adjusts slowly to a change in the rate of devaluation. In particular, even under full (long-run) homogeneity, a stabilization policy based on a preannounced devaluation with a decreasing rate of crawl is bound to generate a lengthy period of (temporal) appreciation of the peso. The dynamic of Chilean inflation can be illustrated by tracing the effects of a 50% devaluation in the first quarter of 1980. Figure 1 shows the impact of
the devaluation on the relative price between differentiated tradables and non-tradables. Even eight quarters after the devaluation, this relative price is 6.5 percentage points above its original value.

The actual trajectories of the real exchange rates are described in Figure 2. From this figure, we observe, almost from early 1975, a sharp drop in the real exchange rate of imports \((P_M/P_N)\) and in the real exchange rate of exports \((P_X/P_N)\). The lowest value for both series occurs in the first quarter of 1982. In contrast, real wages \((W_M/P_N)\) in manufacturing achieve a peak in the last quarter of 1980.
Figure 1

THE EFFECT ON $P_H/P_N$ OF A 50% DEVALUATION IN THE 1ST QUARTER OF 1980
Figure 2

REAL EXCHANGE RATE (1977 = 100)

\[ \frac{P_N}{P_N} \]

Indices for years:
- 1975
- 1976
- 1977
- 1978
- 1979
- 1980
- 1981
- 1982
- 1983

Symbols:
- \( P_X \) = Price of exports
- \( P_M \) = Price of imports
- \( W_M \) = Wage rate in manufacturing
- \( P_N \) = Wage rate in manufacturing

Legend:
- Solid line: \( P_X/P_N \)
- Dashed line: \( P_M/P_N \)
- Dotted line: \( W_M/W_N \)
IV. Exchange Rate Preannouncement, Portfolio Adjustment and the Endogeneity of Capital Inflows

As to the substitution of assets, when the preannounced formula was introduced, the cost of foreign borrowing decreased substantially. As shown in Table 2, it went from 22.6% a year in the fourth quarter of 1977 to 10.2% a year in the first quarter of 1978 and became negative through to the last quarter of 1980. Not surprisingly, even with substantial controls, capital inflows increased from US$73.9 million in the fourth quarter of 1977 to US$194 million in the first quarter of 1978 and US$545 million in the second quarter of 1980 1/ (Table 2, Col. 1). The lifting of the controls on inflows in April 1980 generated a further increase in capital inflows and a drop in peso interest rates (Table 2, Col. 9).

A contractionary monetary policy (Table 2, Col. 5) encouraged through portfolio substitution, further capital inflows. In addition, the long period of appreciation of the peso that followed the preannounced policy of devaluations increased the current account deficit and triggered additional capital inflows.

The interaction between the current account deficit and the flow of capital is obtained from the estimation of an extension of the Kouri and Porter (1974) and Obstfeldt (1982) model. 2/

The model that we use to look at capital flows consists of demand for money, net domestic demand for domestic bonds and domestic demand for external bonds, as well as net external demand for domestic bonds. The latter are

---

1/ Foreign trade financing, not included in this figure, increased substantially also.
2/ The model was estimated in Corbo and Matte (1984).
considered as liabilities of the private sector and consist mainly of medium-term liabilities. The model is completed by a money supply equation, an equation for the change in the Central Bank's internal credit, the definition of the balance of payments, the restriction of wealth, the equilibrium of the internal bond market and the equilibrium of the money market.

The reduced form of the model for capital flows is given by the following equation: 

\[
FCAP_t = \beta_0 + \beta_1 \Delta r_t + \beta_2 \Delta Y_t + \beta_3 \Delta W_t + \beta_4 \text{CAB}_t + \beta_5 \Delta \text{CIBC}_t
\]  

(1)

where

- \( FCAP \) = Net flow of private capital
- \( r \) = Interest rate of foreign bonds in domestic currency
- \( Y \) = Nominal income
- \( W \) = Nominal wealth
- \( \text{CAB} \) = Current account surplus
- \( \text{CIBC} \) = Internal credit of the Central Bank.

The expected signs of the coefficients are as follows:

\[
\beta_1 < 0; \beta_2 < 0; \beta_3 > 0; -1 \leq \beta_4 < 0; -1 \leq \beta_5 < 0.
\]

The principal aim of the model is to explain capital inflows and to determine whether the monetary authority can affect the supply of money. Control over the money supply depends on the compensatory coefficient that measures the drop in the net inflow of private capital associated with a rise

\[
1/ \text{Consideration of a fourth asset does not change the reduced form obtained by Kouri and Porter. The only change from their model is the substitution of } J(\ ) \text{ by } J(\ ) - S(\ ) \text{ where } S(\ ) \text{ is the domestic supply of medium-term bonds in the foreign markets.}
\]
in the Central Bank's net internal credit. This effect is measured by the
coefficient $\beta_5$ of the previous model, denominated as the coefficient of
compensation. If $\beta_5 = -1$, we return to the model of perfect mobility of
capital, and the monetary authority has no control over the money supply.

If $\beta_5 = 0$ and $\beta_1 = 0$, then the monetary policy is completely independent, 1/
and the Central Bank can pursue monetary goals without reference to balance of
payments results. Specifically, it can seek to achieve monetary goals through
the expansion of internal credit. In the more general case of

\[-1 < \beta_5 < 0,\] part of the expansion in the Central Bank's internal credit is
lost through a decrease in the net flow of capital. 2/

Equation 1, with quarterly data in constant 1977 pesos from the first
quarter of 1975 to the first quarter of 1982, came out as follows: 3/

\[
\text{PCAP}_t = 888.9 + -14.06 \Delta r_t^* + 0.25 \Delta Y_t - 0.32 \text{CAB}_t
\]

\[\begin{align*}
(2.46) & & (-0.59) & & (5.66) & & (-5.64)
\end{align*}\]

1/ See Kouri and Porter (1974, pp. 450-51).
2/ Initially we used, following Kouri and Porter, a model in nominal
variables. However, as should be expected of an economy with high
inflation, heteroskedasticity was detected in the errors, and we
therefore reformulated the model in real terms. For this purpose we
assumed first degree price homogeneity in the demand for assets.
3/ The equations were estimated by OLSQ. The coefficients in parentheses
are the t statistics. We also included a proxy for real wealth in the
estimates. The proxy was obtained by computing permanent income with the
autoregressive process used in the specification and estimation of a
demand for money, with a value for the autoregressive coefficient of .513
obtained in the estimation. (For the model used, see Corbo, 1982). The
wealth variable thus constructed was never significant, and we therefore
ignored it in the remaining estimates. Stability analysis of the
original equation, which has no dummy variable, clearly indicated a break
in the constant beginning in the second quarter of 1982, when most of the
controls on capital inflows were lifted.
\[ -0.34 \Delta\text{CIBC}_t + 3954.9 \text{ D}_t \]
\[ (-4.35) \quad (6.66) \]

\[ R^2 = 0.93 \quad T = 29 \quad SSR = 23033 \times 10^3 \]

\[ DW = 1.73 \]

where

\[ \text{FCAP}_t = \text{Net capital inflow, in 1977 pesos} \]
\[ \text{r}_t = \text{LIBOR interest rate plus devaluation rate} \]
\[ \text{Y}_t = \text{Real GDP, in 1977 pesos} \]
\[ \text{CIBC}_t = \text{Net internal credit of the Central Bank minus the increase in cash reserves, in 1977 pesos} \]
\[ \text{CAB}_t = \text{Current account surplus in 1977 pesos} \]
\[ \text{D}_t = \text{Dummy variable that takes a value of one from the second quarter of 1980 on, a zero otherwise.} \]

In the preliminary results, the coefficient of the change in internal credit differs significantly from zero but is substantially higher than minus one. 1/

In Figure 3 we have used this equation to compare the estimated values with the equation versus the true ones for the dependent variable. The figure shows that our model closely follows the observed evolution of the dependent variable. Further, the model identifies most of the break points in the net capital inflow (FCAP).

1/ We also tested the null hypothesis of homoskedastic disturbances. For this purpose we used the Goldfield and Quandt test. In conducting the test we left out the five central observations. The F computed to 1.25. At a significance level of 5%, the F (6,6) is 4.28, and therefore the null hypothesis of homoskedasticity could not be rejected.
Figure 3

NET PRIVATE QUARTERLY CAPITAL FLOWS

M = 12758.720

ID M = -1226.420

--- Observed net capital inflows.
--- Estimated net capital inflows.
These results show that both the change in the net internal credit of the Central Bank (ΔCIBC) and the current account surplus (CAB) coefficients are significantly different from zero and are very similar. Moreover, the compensation coefficient is closer to zero than to minus one. In fact, the null hypothesis that the ΔCIBC and CAB coefficients are not statistically different cannot be rejected (the F computed at 0.039). This condition, which is a restriction in the coefficients of the reduced form, is a rather convincing test of the validity of the model (Kouri and Porter, 1974, p. 450).

The final equation is given by:

\[
\text{FCAP}_t = 850.7 - 15.18 \Delta r_t^* + 0.25 \Delta Y_t - 0.32 \text{ CAB}_t \\
(2.84) (-0.66) (5.81) (-7.03) \\
- 0.32 \Delta \text{CIBC}_t + 3902.4 D_t \\
(7.03) (7.49) \\
T = 29 \quad \text{SSR} = 23072.10^3 \quad \text{DW} = 1.74
\]

Our results compare well in explanatory terms with those for other countries, especially considering that we are working with real variables. In addition, on the basis of the results of the last equation, we find that the common coefficient of ΔCIBC and CAB is statistically smaller than one using a one-tail test.

Thus, contrary to what has been claimed by other observers of the Chilean economy (Harberger, 1985; and S. Edwards, 1984), capital inflows are mostly explained by a portfolio adjustment model, even in periods where controls on capital inflows were present. However, the significance of the
dummy variable for the period when the controls on capital inflows were reduced indicates that the lifting of controls gave capital inflows a further push (Corbo, 1983 and 1985b).
V. The Macroeconomic Effects of the Preannouncement Policy

The increase in output, the decrease in real interest rates in late 1979 and 1980 (Table 2) and the rise in wealth substantially increased domestic expenditures in 1979-80 and 1981. The increase in wealth resulted in part from the increase in the market value of assets without an equivalent increase in the reposition cost (the Tobin's q).

To provide some evidence on the causes of expenditure increases, we estimated an expenditure model. The equation explains expenditures by real GDP, real interest rates and real wealth (see also Frenkel and Mussa, 1979).

The estimated equation is: 1/

\[ E_t = 835.9 + 0.968 Q_t^* - 2,112.5 r_t^* - 5,888.4 r^*_t + 0.0011 W_t + 0.0022 W_{t-1} + 0.0033 W_{t-2} \]

\[ (0.10) (6.84) \quad (-0.69) \quad (-3.97) \quad (2.27) \quad (2.27) \quad (2.27) \]

\[ T = 30 \quad DW = 2.15 \]

\[ R^2 = 0.978 \]

where

\[ E = \text{Absorption in 1977 prices} \]

\[ Q = \text{GDP in 1977 prices} \]

\[ r = \text{Real interest rate of peso loans} \]

\[ r^* = \text{Real interest rate of dollar loans} \]

\[ W = \text{Total wealth in 1977 prices, measured as capital stock times Tobin's } q, \text{ plus the sum of high power money and net foreign assets.} \]

1/ The coefficients of wealth were restricted to a polynomial of degree 1 with near restrictions.
Real expenditures rose 10.5% in 1979, 9.3% in 1980 and 10.9% in 1981, compared with 8.3%, 7.5% and 5.3% increases for GDP in the same years. The real expenditures generated demand pressures in the market for both tradable and non-tradable goods (see Table 1). The interest rate for consumer loans decreased even more, as commercial banks and financieras competed in a market that had been the exclusive preserve of retailers and department stores. \[1/\] The decline in real interest rates and increase in wealth also set off booms in the real estate and stock markets.

The increase in domestic expenditures in turn gave rise to a boom in the non-tradable sector and required a market-clearing appreciation of the peso (a drop in PT/PN). Thus, although the preannounced exchange rate policy triggered the appreciation of the peso, it did not result in rising unemployment and falling output. Rather, the drop in the real exchange rate was validated by the decrease in the real interest rate and the increase in expenditures that resulted from the portfolio adjustment and the increase in wealth.

In 1981 a large increase in expenditures followed a substantial drop in interest rates. In the relative prices of 1980, excess demand for non-tradables developed, and the relative price of tradables fell to clear the market in non-tradable goods. The mechanism of adjustment was an expenditure-induced excess demand for non-tradables that increased their price, whereas the price for tradables remained almost constant, with international inflation compensated for by the appreciation of the dollar in the international markets.

\[1/\] I owe this point to Carlos Massad.
Concomitantly with these internal developments, Chile was suffering the effects of the international recession. In 1981, it experienced an overall loss in its terms of trade because of a deterioration in the commodity terms of trade and a substantial increase in the international interest rate. This loss -- on the order of US$1,200 million in 1981, or 3.4% of GDP -- should have dampened the increase in expenditures. However, expenditures continued growing at rates far above the increase in GDP (10.8% versus 5.3%, respectively), a pattern that suggests that Chileans were perceiving a substantial increase in their wealth. Indeed, between December 1977 and December 1981, the Chilean stock market price index septupled. As a result, the deficit in the current account rose to US$4,814 million in 1981 (13.7% of GDP), almost $3,000 million more than the deficit in 1980. Doubts about the sustainability of the exchange rate policy may have accelerated the purchase of durable goods. Furthermore, because of the dynamic of inflation following the fixing of the exchange rate and the appreciation of the dollar in the international markets, the expansion of expenditures took place at very low inflation rates (9.5% in 1981, as against 31.2% in 1980). Indeed, the appreciation of the dollar was equivalent to a decrease in the nominal exchange rate. If, instead, capital inflows had been lower because of a higher rate of crawl or an interest equalization tax or direct controls on foreign borrowing, real interest rates would have been higher in 1980, domestic expenditures lower. In turn, the demand pressures on the market for non-tradables would have been correspondingly lower and the current account deficit smaller. In keeping with those conditions, the appreciation of the peso would have been smaller than what was observed (Corbo, 1983; Condon, Corbo and de Melo, 1985; and Harberger, 1985).
The link between an exogenous shock in capital inflows and the real exchange rate can also be studied in a model where capital flows are treated as a transfer (Dornbusch, 1980). Using a five-sector general equilibrium version of this type of model, Condon, Corbo and Melo (1984) found that if capital inflows had been 50% lower in 1980 and 1981, the equilibrium real exchange rate would have been 13% higher. Interestingly enough, the resulting change in the composition of output in favor of labor-intensive sectors would have produced only a marginal drop in employment.

The appreciation of the peso and ensuing loss in competitiveness of the tradable sector between the middle of 1979 and the end of 1981 was about 28% of the mid-1979 value. The profitability of the tradable sector was further weakened by movements in the real interest rate, which started to rise substantially in the beginning of 1981 because of a restrictive monetary policy and doubts about the sustainability of the fixed exchange rate regime. During the second half of 1981, the ex post real interest rate rose to almost 40% a year for peso-denominated loans and 15% a year for dollar-denominated ones. These higher rates also generated a drastic fall in domestic expenditures and a recession toward the end of 1981 that carried over to 1982. When capital inflows started to decline in late 1981, the increase in interest rates and the decline in expenditures became substantial. In early 1982, the fall in expenditures reduced the demand for both tradables and non-tradables. In turn, the reduction in the demand for tradables improved the commercial account of the balance of payments, while that for non-tradables created an excess supply in the market for those goods and required

1/ The increase in the own real interest rate for the tradable-producing sector was even higher, as its inflation was much lower.
an increase in the real exchange rate to restore equilibrium with the lower level of domestic expenditures. In fact, given the decline in international prices in nominal terms and the fixed exchange rate, the improvement in the relative price of tradables actually required a substantial decrease in the nominal price of non-tradables to restore the real exchange rate to equilibrium. However, with the price of non-tradables inflexible downwards, especially in an economy with backward wage indexation, the adjustment to lower expenditures took the form of an increase in unemployment. 1/

Thus, the improvement in the real exchange rate \( (P_T/P_N) \) called for by the macro adjustment was slow and costly in terms of output and employment because of the downward inflexibility of the prices of many non-tradables. Furthermore, the high real interest rates of 1981 weakened the financial situation of firms considerably, especially those in the tradable sector that had lost an important part of their working capital in the protracted period in which the peso had been appreciating. The appropriate way to move the relative price of tradables back to the equilibrium level called for by the reduction in expenditures would have been a devaluation combined with a suspension of wage indexation, a policy that should have been implemented in late 1981.

On June 14, 1982, the government in fact decided to help the adjustment in relative prices by devaluing the peso against the dollar by 18%. It also adopted a new exchange rate system that pegged the peso to a basket of currencies. This measure was taken to reduce short-term fluctuations in the real exchange rate arising from fluctuations in the value

1/ This outcome has been anticipated in Corbo and Edwards (1981).
of the dollar in the international markets. In addition, a monthly
devaluation of 0.8% with respect to the basket of currencies was announced for
the next 12 months. On June 18, 1982, the government announced a further set
of measures to accompany the devaluation. Included was the suspension of wage
indexation. These measures were aimed at neutralizing the possible effect of
the devaluation on the price of non-tradables and at reducing the potential
fiscal deficit.

As the public judged the initial devaluation -- with its associated
passive crawl formula -- to be inappropriate, substantial pressure developed
in the exchange rate market. In fact, the post-devaluation adjustment of the
Chilean economy proved more difficult than policy-makers had anticipated.
This devaluation -- following three years of assurance to the public that the
exchange rate policy would not change and that any devaluation would only
create inflation -- spurred a run on the peso. The Central Bank lost around
US$460 million (13.2% of international reserves) between June 14 and August 6.
At that point the government replaced the crawling peg regime with a flexible
exchange rate regime, and simultaneously it also eliminated all restrictions
on foreign exchange transactions. 1/ Floating the exchange rate did nothing
to alleviate the crisis of confidence; instead it became even worse. By then,
the foreign debt was US$17 billion, most of it in private hands. A financial
crisis started, while the run on the peso continued. As a partial solution,
the government introduced a preferential exchange rate for the service of
foreign debt contracted on or before August 6, 1982.

1/ There was a US$10,000 a month limit on the amount of foreign exchange
that any Chilean could buy until August 6, 1982, when this limitation was
lifted.
After the exchange rate was floated, its value increased substantially, a trend that prompted the Central Bank to intervene by abandoning the free float in favor of a dirty float. In that attempt to support the peso the Central Bank lost another US$450 million in reserves between August 6 and September 20, 1982. Meanwhile, the exchange rate fluctuated widely around an upward trend. With capital inflows substantially reduced and with more than half of the export earnings controlled by the government, it became very difficult to implement any type of floating rate system. Furthermore, the new economic authorities decided it was not proper, in the middle of a major crisis of confidence, to keep a dirty float. Thus, on September 19, 1982, the Central Bank, to stabilize the exchange rate, announced its intention of supporting an exchange rate band that would allow fluctuations of ± 2% around an upward trend for the next 120 days. The trend started at 66 pesos to the dollar and followed a passive crawling peg system, with a monthly rate of crawl equal to the previous month's CPI inflation rate minus 1% (an estimate for world inflation). The band was subsequently extended to 180 days.

The exchange rate adjustment in the second half of 1982 was difficult because of the large capital outflows during the period of unstable exchange rates and the sudden drying up of foreign credit because of the debt problems of Argentina, Mexico, and Brazil. To smooth the adjustment to the sharp drop in capital inflows -- net private inflows went from US$4.5 billion in 1981 to -$0.5 billion in 1982 -- the amount of borrowing by government and state enterprises was increased substantially in the second half of 1982. A long recession and a large devaluation eroded substantially the financial situation of private firms. Further, because of poor banking practices -- firms in the
non-tradable sector were having to deal with large exchange rate risks -- the
devaluations had unwanted side-effects. As bankruptcies spread, the
government decided in early 1983 to take over the two largest private
commercial banks to avoid their collapse. Chile has spent the two years since
then trying to solve the internal financial crisis as well as its severe
balance of payments crisis.
VI. Conclusions

Three main conclusions can be drawn from Chile's experience. First, the liberalization and stabilization reforms implemented during the early years of the military government, in spite of the unfavorable external shocks of 1975, succeeded until late 1978, except that the rate of unemployment and real interest rate remained stubbornly high. The unemployment rate was largely ignored, while most of the time the high interest rate was attributed mainly to restrictions on capital inflows. The main cause, however, was the lack of adequate supervision of the financial system (Arellano, 1984; Zalher, 1983 and 1985; Corbo, Melo and Tybout, 1986; and Tybout, 1985).

Second, the second stabilization attempt, undertaken when inflation was down to 35% a year -- a level similar to the average for the 1960s -- worked at cross-purposes with the export-led growth being generated by the liberalization of trade. Indeed, the use of the exchange rate to stabilize the economy created not only a temporal short-term real appreciation of the peso, it also encouraged external borrowing at a time when the restrictions on capital inflows were being lifted and the capital markets were very liquid. The large rise in expenditures that followed the decrease in interest rate and increase in wealth caused the peso to appreciate further. The result was an unsustainable current account deficit that ran close to 25% of GDP in the first half of 1981. The appreciation squeezed tradables just when exporters were making inroads in the world markets and firms in the import-competing sector had completed a major adjustment to the trade liberalization. Not surprisingly, firms in the tradable sectors suffered a large squeeze on profits (Corbo and Sanchez, 1985; and Galvez and Tybout, 1985).
Third, contrary to what the authorities thought, the large spread between the domestic and foreign interest rates was as much a problem of imperfect asset substitution as it was a problem of control of the inflows of capital. Thus the intensity of the opening up of the capital account should not have been governed chiefly by the spread in interest rates.
Appendix 1
Principal Reforms
Chronological Synthesis

Commercial Policy 2/

Prereform situation (September 1973): Quotas and quantitative restrictions are widespread. The tariff range was from 0% to 750%, with a mean value (weighted by the number of tariff positions) of 105% and a mode of 90% and a median of 80%. 2,872 tariff positions were subject to an import deposit of 10,000% of the CIF value.

September 1973-July 1975: The highest nominal tariff was reduced from 750 to 140% and then to 120%. The mean weighted tariff (MWT) was reduced from 105% to 57%.

August 1975-November 1977: A tariff goal was defined with six nominal levels between 10% and 35%, to be enacted in the first quarter of 1978. This structure was reached in August 1977 because of an anticipation of the last two stages. During this period the highest nominal tariff (HNT) dropped from 120% to 35% (except for the motorcar industry) and the MWT from 44% to 19.7%.

December 1977 onwards: In December 1977 a target structure was established with a 10% uniform tax to be reached in June 1979. The goal approximation was gradually made by means of small monthly adjustments. In this period the MWT went from 19.7% to 10.1%.

Complementary aspects of the reforms: All tariff exemptions were eliminated, first by requiring the public sector to be subject to the general regime as early as 1974. Consumption surcharge taxes that taxed imports at a higher rate than domestically produced competing goods were eliminated. By September 1976, previous deposits were eliminated except for cars and used or damaged merchandise, and a list of allowed import items was replaced by a short list of forbidden items. Finally, in August 1981 the list of forbidden items was eliminated.

Price Liberalization 3/

Prereform situation (September 1973): More than 3,000 prices were fixed by DIRINCO (Commerce Department, a dependency of the Ministry of the Economy).

October 1973: Law decree 522 defined three groups of goods and services: those whose prices were to be freely determined (the majority); those...
goods and services) whose price would continue to be fixed by DIRINCO (by means of cost studies); and a group of 18 goods whose prices were to be provided to DIRINCO, even though they were to be freely determined.

October 1973-May 1982: The general tendency was toward price liberalization. In December 1980, law decree 3529 was enacted forbidding items in the informed price category from being reclassified as fixed price goods and those freely priced ones to be put either under the informed price category or the fixed price category.

Labor

Prereform situation (September 1973): The following items were legally included in individual contracts: work hours (normal and overtime pay), work conditions, length of vacation, salary (at least the minimum) and so on. In addition, a lump sum payment for each year of work made labor dismissal extremely difficult and expensive.

1974 onwards: Discriminatory benefits were slowly eliminated; family allowances and retirement ages were made uniform for blue-collar and white-collar workers. Social security contributions were slowly reduced. Union power was heavily reduced.

In 1978 and 1981: Efforts were made to permit greater bargaining flexibility for vacations, indemnizations and profit sharing. Further, employers were allowed to lay off workers without justification. Minimum wage market coverage was reduced.

July 1979: A "Labor Plan" was enacted. This plan reintroduced collective bargaining for a fraction of the labor force. In contract bargaining, the lowest offer that employers could make was equal to the previous wage adjusted by the CPI.

External Capital Markets 1/

The reforms in the capital markets were too numerous and in the initial stage lacked a clear direction. Among the main reforms were the following.

September 1977: Commercial banks were allowed to become indebted under article 14 of the exchange law. 2/ A monthly minimum limit of 5% of capital and reserves was imposed for the flow of this type of operation.

January 1978: The Central Bank established a stock limit of 25% of capital and reserves for debt under article 14.

2/ Article 14 refers to the permission given by the Central Bank to the borrower for future access to the exchange rate market to serve a foreign debt.
March 1978: The stock limit was raised to 160% of the capital plus reserves of commercial banks.

April 1978: The global limit was raised to 180% and a sublimit of 160% for debts, with a mean amortization of 36 months or lower. Article 14 limits were raised to 45% and 25% for debt of the above types. This credit had to be channeled toward dollar-denominated debt.

For the first time, a limit on external debt was imposed on development banks. This limit was 400% of capital and reserves, or 500% if the excess over the 400% was covered by credits with a maturity of 36 months and over.

December 1978: The global limit and sublimit were raised to 180% and 215% for commercial banks and to 400-600% for development banks. The limit under article 14 was raised from 45% to 60%.

April 1979: The sublimit of 215% was raised to 225% for commercial banks, and the article 14 limit from 60% to 70%. A variable reserve requirement was established for external credits depending on the length of maturity of the loans: 10% for those with a maturity of 48 to 66 months, 15% for those of 36 to 48 months, and 25% for those of 24 to 36 months.

June 1979: The global limits on external borrowing were eliminated. From this moment on the only limitation on bank indebtedness was the lawful internal limit on total debt: 20 times capital and reserves. Debt limits under article 14 were maintained, but reduced to 5% of capital and reserves or US$1 million, whichever was greater.

April 1980: All monthly limits under article 14 were lifted.

September 1980: Commercial banks were allowed to lend in external markets using their own resources.

December 1981: For the first time, commercial banks were allowed to lend short term (180 days) with external credit for purposes other than financing commercial operations.

May 1982: Commercial banks were allowed to obtain external credit with a maturity under two years subject to a reserve requirement of 20%.

July 1982: Commercial banks were allowed to use part of their short-run foreign credits to lend in pesos, with a limit of 50% of capital and reserves.
Domestic Financial Markets

a) Interest rates

Pre-reform: Nominal interest rates were fixed by the central bank. As the resulting real interest rates were highly negative, most credit was allocated by quotas.

May 1974: Law Decree 455 modified the interest rate concept to the quantity that the creditor received and that exceeded the capital value properly adjusted by inflation. In the same law decree, free bargaining of the interest rate was established, subject to the restriction that it not exceed 50% of the current interest rate for inflation-adjustable operations and non-adjustable operations, whichever the case.

September and October 1974: Commercial banks were allowed by the Central Bank to determine freely the interest rate for deposits with a maturity longer than 60 days, a maturity that was later lowered to 30 days.

June 1975: The Central Bank allowed commercial banks and the Banco del Estado to determine freely the interest rate on both inflation-adjustable operations and non-inflation-adjustable operations.

b) Operational and institutional aspects

December 1973: New bank establishments were prohibited until December 1974. To relax this limitation, the so-called "operative representation of foreign banks" was created. These entities could not operate in the domestic deposit market nor extend domestic currency credits.

December 1974: Rules were established with respect to the organization and functioning of financial institutions, which were to be corporations with the sole social objective of acting as financial intermediaries. Minimum capital limits were established together with specifications of operations that were allowed or not allowed. Limits on investments and credits to the same natural or legal entity are imposed. The banking law was modified, so that no natural entity could own more than a 1-1/2% of the capital of a bank, a limit that was raised to 2% if the entity was a legal one. For new banks, this limit would be enforced five years after operations started. Commercial, development and mortgage banks were not allowed to have shares of small financial institutions. Foreign banks were permitted to establish branches and offices in Chile.

In January 1976: A law concerning the management of Investment Funds Societies (Fondos Mutuos) was published to regulate which investment instruments could be bought, such as corporation shares, bonds, debentures,

1/ Based on "Evolucion de las principales normas que regular el mercado financiero chileno, Septiembre 1973 - Junio 1980," Banco Central de Chile, 1981.
IOUs, government debt and other debt. Minimum capital requirements were raised, regulatory provisions were established, and all types of debt instruments were enlarged.

Foreign Exchange Policy 1/

Pre-reform situation (September 1973): There were multiple exchange rates, parallel exchange markets, and large overvaluation of the peso.

October 1973: There was a maxidevaluation, and the exchange markets were reduced to three.

August 1974: The special exchange rate for copper exports was eliminated. The spot market dollar initially suffered 2 devaluations and later another 15. The mean devaluation rate of the year was 6.1%. Total annual devaluation in this market was 166.7%. In the banking market, 24 devaluations were made during the year; the result was a mean devaluation rate of 6.9%, with an annual rate of 392.1%.

1975: The exchange rate policy consisted of small periodic devaluations.

June 1976: A 10% revaluation was effected.

August 1976: An exchange rate system with one rate was reached.

March 1977: A 10% revaluation was effected.

December 1977: The government announced that the devaluation rate would exceed the inflation rate to compensate for tariff reductions.

February 1978: A formal tablita consisting of devaluations at a decreasing rate was established. This one lasted until June 1979.

June 1979: The exchange rate was fixed at the rate programmed for December 1979 in the later tablita, with the concurrent announcement that this fixing would last until February 1980.

December 1979: The fixed rate was extended indefinitely.

June 1979-June 1982: An 18% devaluation ended with the fixed rate period. The new system consisted of one in which the peso was pegged to a basket of foreign currencies.

August 1982: The floating rate policy was enforced.

September 1982: A new tablita, with monthly devaluations equivalent to the previous month's inflation rate minus 1%, was announced. Access to the exchange market was severely restricted.

1/ French-Davis (1979) and Meza (1981).
References


