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### **The Capital Account Liberalization in Chile 1974 - 1982**

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## THE CAPITAL ACCOUNT LIBERALIZATION IN CHILE, 1974-1982

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### I. INTRODUCTION

The liberalization of the financial market was a decisive instrument to achieve the overall liberalization of the Chilean economy, main objective set by the government which took over, in late 1973. This reform aimed at an increase in the allocative efficiency of credit, a vaster availability of domestic and foreign savings to finance domestic investment over its historical levels, and the logical complementarity to the liberalization occurring in other markets.

One important feature of this liberalization was the opening of the capital account which took place between 1973 and 1982. This opening was, however, incomplete and slow, and, consequently, very different from the one of the trade account. It was incomplete, because it centered its reforms on the inflows of capital; outflows remained restrained, at least relatively to inflows. The opening was also slow. Before 1977, quantitative controls on inflows existed but were not binding since the world capital market was virtually closed to Chilean borrowers as a consequence of their low creditworthiness. However, the situation changed after 1977. As the performance of the economy began to improve, the domestic residents became more eager to borrow (inside or outside) while foreigners became more prone to lend. Nevertheless, the authorities opened this unknown market with caution until mid-1980. The principal reason to choose this low speed was the desire to retain control over

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monetary and credit policies, which had been and were still to be for some time, the main instruments of the ongoing stabilization efforts. It was considered that the significant differential between the foreign and the domestic interest rates would, when eliminating the restrictions on capital inflows "attract such a volume of foreign loans that the stabilization program would be postponed"<sup>1</sup>. This view was premonitory. After mid-1980, when controls on foreign capital inflows were significantly reduced, capital inflows skyrocketed until late 1981 and inflation remained over 30 percent until 1982. Curiously, when in 1982, controls on inflows were fully lifted, they fell meaningfully and so did inflation, but an acute financial crisis and a deep recession ensued; controls on outflows were maintained.

Capital inflows were concomitant with two major occurrences. On the one hand, they helped finance an expenditure boom. On the other, they hampered severely the surge of the tradable production, putting a serious question mark on the depth and timing of the trade liberalization -completed by mid-1979- and on their own justification. It has been argued that trade liberalization brought about expanding trade deficits which had to be financed with growing capital inflows. Hence the lifting of controls to validate these trends. However, the reverse can also be argued. The opening of the capital account, measure consistent with the overall desire of liberalizing the economy, allowed major flows into the country, given the state of world liquidity, which stimulated growing trade deficits by financing domestic expenditures and through appreciation of the domestic currency. The paper takes the last view while pretending to throw some light into the relationship between trade and capital account liberalizations. This endeavor obviously requires that the main forces behind foreign capital inflows be disentangled and that a precise relationship between flows and currency appreciation be precisely established.

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<sup>1</sup> De la Cudra, 1980, quoted in French-Davis, 1981.

The main characteristics and determinants of capital inflows between 1974 and 1982 are summarized in Section 2. The next section presents a simple theoretical model to explain the real exchange rate. Section 4 summarizes the principal empirical results. Comments will be made in Section 5 on major impacts of capital inflows while the last part of the paper highlights lessons suggested by the Chilean experience on the order of liberalization.

## II. STYLIZED FACTS ON FINANCIAL LIBERALIZATION AND CAPITAL INFLOWS

The financial market liberalization was associated with the freeing of interest rates in April 1975, the elimination of quantitative credit controls in May 1976, the progressive reduction of legal reserve requirements between March 1977 and December 1980, and the gradual relaxation of the limits on foreign borrowing for banks which begun in June 1976 and ended in July 1982 when they almost faded out. Other measures included the divestiture of most of the banking shares acquired by the state during the Allende's Government, the move towards multipurpose financial institutions, and the indexation of financial assets, while exemption of monetary correction from income taxation was established.

As a consequence, the growth of the financial system was spectacular. Between 1975, when liberalization started and 1981 when it was almost completed, outstanding loans grew in 1,630 percent, foreign financing, in 5,888 percent, domestic financing in 1,144 percent and M2 increased between 1974 and 1981 at an average annual rate of 29.6 percent-when all expressed at constant 1977 prices. Time deposits reacted also strongly to the interest incentive: their importance rose from 1.1 percent of GDP in 1974 to 7.7 percent in 1978 and to 25.3 percent in 1981 while real ex-post interest rates jumped from negative to positive values fluctuating between 5.8 percent and 26.5 percent during the same period. However, real savings did not behave in such an optimistic fashion, as was expected by Shaw and McKinnon supporters.

Domestic and national savings remained below what they had been in the late sixties and early seventies and did not show any correlation with the interest rate performance<sup>2</sup>.

Meanwhile, capital inflows remained at a modest level until 1977, accelerated until 1981, falling back in 1982 in a critical way. From then on, voluntary foreign lending stopped and severe controls over capital inflows were reestablished ending abruptly the episode of the capital account liberalization. Then, the relevant overlapping period of large inflows and a growing opening in the capital account covers from 1978 up to 1982. Their main characteristics are summarized below.

(i) As a proportion of exports of goods (FOB), gross debt increased at an annual average rate of about 50 percent during the period 1974-82, but less than 30 percent before 1978, and over 110 percent in 1981, the peak year. However, foreign reserves accumulated also from 1976 until 1980 (Table 1).

(ii) Medium term inflows represented 78 percent of the total between 1976 and 1982 (detailed information is not available before 1976) (Table 1). This result is consistent with the conditions imposed on capital inflows by the government in relation to their terms. However, short term debt exploded late in 1980 and in 1981 despite controls not fully lifted at the time.

(iii) Notwithstanding the deterioration of economic conditions in the country, the loss of creditworthiness of Chilean debtors, and the contraction in international liquidity, the new indebtedness in 1982 was non-trivial: the gross debt increased by 1.6 billion, or 10.4 percent of the stock of debt by the end of 1981. However, most of the loans were made to public enterprises with the guarantee of the government—suppressed earlier. Authorities

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<sup>2</sup>More detailed characteristics of the reforms of the Chilean financial market and of some of its main consequences can be found in Edwards and Edwards (1987), Barandiarán (1988), Edwards (1988) and Ramos (1988).

were trying to buffer the foreign exchange reserves at Central Bank, both to avoid a major run against the peso and to meet the growing demand of reserves without sending alarm signals to economic agents. Most loans to the private sector disbursed in 1982 had been agreed upon before the closing of the capital market.

(iv) Before 1975 the public sector was the main domestic borrower. After 1977, the flows proceeded mainly from foreign commercial banks to domestic private financial institutions until the end of 1981 (Table 1). A major change occurred in the sectorial distribution of borrowers in the debt accumulation: 79 percent of the net increase in foreign debt between 1976 and 1982 (short, medium and long term) was non-guaranteed -to the private sector and public firms alike. As a consequence, the participation of private debt in the total medium and long term debt outstanding<sup>3</sup> rose from which was 11 percent in 1974, reached 63 percent in 1982. This noted trend was consistent with the government's expressed desire of privatizing the economy, with the rapid integration to the international private capital markets, and with the balanced or surplus budget policy. About 60 percent of the total Chilean debt was not backed by the state guarantee in late 1982.

(v) The acceleration of capital inflows coincided with the attainment of the highest degree of trade liberalization: a flat 10 percent tariff without NTBs to remain at that level until 1983 when the world financial capital market had closed its doors even to government guaranteed Chilean borrowers and when the tariff was raised to 20 percent (Graph1). The trade balance deficit increased from US\$ 426 million in 1978 to US\$ 2,677 million in 1981 despite the growth of exports at an average annual rate of 8 percent in constant prices during this period. The abovementioned acceleration also coincided with a reduction in the real exchange rate of 36 percent between 1978 and 1982<sup>4</sup>.

<sup>3</sup>The information for short term is not available.

<sup>4</sup>The real exchange rate is defined as the nominal exchange rate deflated by the ratio of the GDP Deflator and an External Inflation Indicator (de la Cuadra and Hachette, 1987, Table A-8).

TABLE 1: ANNUAL CHANGES IN FOREIGN DEBT, 1974-82

(US\$ million)

Years	Gross Debt			Net Debt			Public			Private			
	Total (1)	Public (2)	Private (3)	Total (4)	Public (5)	Private (6)	Accumulated Total Gross Debt (7)	Medium and Long Term		Total (10)	Other (11)	Financial (12)	Short Term (13)
								Medium and Long Term (8)	Short Term (9)				
1974	626	n.a.	n.a.	699	n.a.	n.a.	4026	n.a.	n.a.	44	n.a.	16	n.a.
1975	324	n.a.	n.a.	-547	n.a.	n.a.	4267	n.a.	n.a.	227	n.a.	178	n.a.
1976	-133	-306	172	-370	-543	143	4274	-122	-184	129	158	-29	43
1977	480	155	326	315	-10	341	4510	45	110	191	185	6	135
1978	1,453	792	671	678	7	621	5923	833	-41	580	317	265	91
1979	1,819	354	1,466	113	-1,352	1,332	7507	418	-64	1,166	673	493	300
1980	2,600	-	1,314	1,290	-1,310	1,110	9413	-51	51	1,957	556	1,401	643
1981	4,458	402	4,056	4,757	700	3,719	12553	-305	707	3,445	924	2,521	611
1982	1,610	1,195	313	2,808	2,393	328	13615	742	453	520	239	281	-104

Notes: n.a.: not available.

Unless otherwise stated, all columns express annual changes in stocks.

The difference between gross and net debt correspond to net accumulation of international reserves.

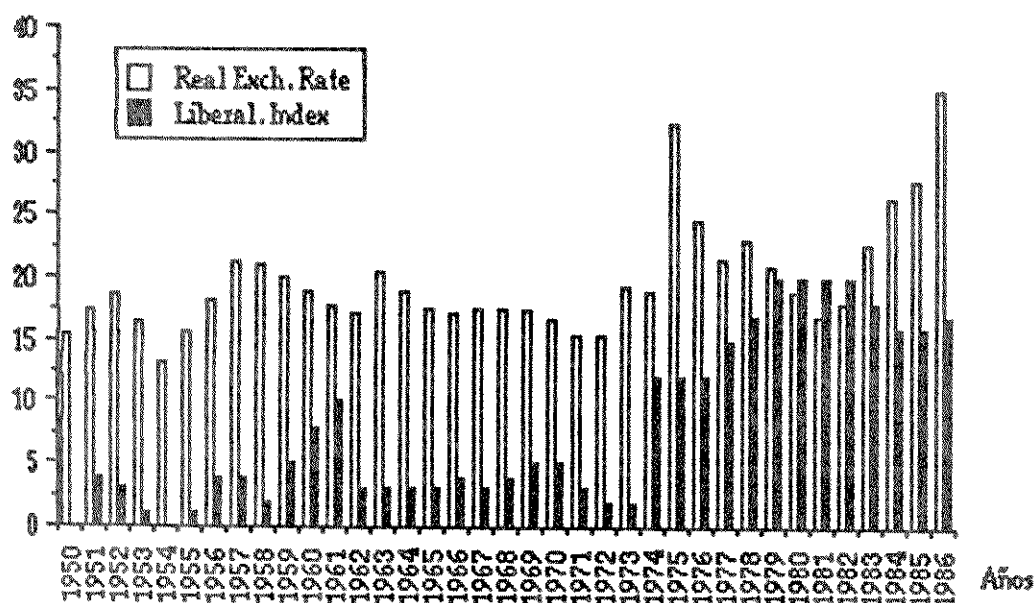
Col. 11 includes suppliers, import credits and others.

Col. 12 does not include the State Bank embodied in the public sector.

Source: Central Bank of Chile, (1983) Chilean External Debt.



GRAPH 1  
LIBERALIZATION INDEX AND REAL EXCHANGE RATE



Over time, different causes can describe the trends of foreign capital inflows. Only the most outstanding ones will be presented<sup>5</sup>. It is possible to distinguish between supply and demand factors, and into institutional ones, although the last can be tied either to supply or to demand. Further, the accent will be put on private inflows since they represented the highest share of foreign debt accumulation. Their demand was directly related to the deficit generated in the Chilean private sector which displaced the traditional public sector as the main source of deficit at least during the period 1979-81, period of higher accumulation of total net foreign debt<sup>6</sup> - debt minus foreign reserves.

On the supply side, The private sector indebtedness was stimulated after 1976 and until the end of 1981 by the increase in world liquidity, the liberalization of the world financial

<sup>5</sup> A more detailed account of each of them can be found in Hachette (1989).

<sup>6</sup> See Hachette (1989).

market and the relative laxity in its banking regulations, the tacit approval of the Chilean economic program by the foreign money centers with the concomitant increase in creditworthiness and the reduction in the relevant country's risks considerations, the low initial private debt in 1976, and last but not least, the relaxation of quantitative controls imposed on the capital inflows by the Chilean monetary authorities. By the end of 1981, the situation was reversed. The world recession and the growing apprehension over the viability of the Chilean financial system were instrumental in stopping the lending by private foreign sources to the Chilean private agents altogether.

On the demand side, perhaps the most important determinant of the demand for credit and private foreign inflows was related to the rapid increase in private expenditures of the Chilean private sector after 1976 - 11.4 percent annual average between 1976 and 1981 against an historical rate of only 4 percent<sup>7</sup>. This significant change in trends could be attributed to overoptimism fed both by the rapid surge in GDP, much over historical rates and during the longest period since 1950 accompanied by the systematic reduction in the rate of unemployment, the significant increase in asset prices in anticipation to rising expected dividends and, during a short period, to falling discount rates<sup>8</sup>, and by the willingness to be deceived by the optimistic views of Authorities with respect to the significance and length of the depression when it started in 1981 in the rest of the world. The removal of the liquidity constraint may also have been decisive in changing the private sector behavior. However, it could have been relevant only in the last part of the period analyzed, when the constraints on capital inflows were effectively removed, after 1979. Another very relevant factor was moral hazard derived from the perception of economic agents of the willingness on the part of the government to bail out all financial institutions with solvency problems. This insurance, at

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<sup>7</sup>Private expenditures as defined here includes total gross investment. Since public investment was being reduced at the time as a share of GDP, the noted rates of growth of private expenditures are downward biased.

<sup>8</sup>Parandiarán E. (1983).

no cost for the banks, induced risk taking in the portfolio decision, since the premium for risk would be obtained by the shareholders (Valdés, 1986).

Other important factors impacted the demand for foreign loans as well such as the scanty domestic credit available to the private sector net of foreign inflows, high differentials between expected domestic and foreign interest rates and, to some extent the exchange rate policy.

Two elements will be underlined which make the basic differences of our explanation with most others. First, inflows of private capital do not appear to have been stimulated, at least in any significant degree, by the fixed exchange rate applied during the period 1979-82. In fact, the direction of causality may have been the reverse: the inflows of private capital drove the real exchange rate down by lowering the relative prices of tradables to non-tradables. Had Chile chosen at the time a policy of floating exchange rate, it is likely that the appreciation of the peso would have occurred anyway, and perhaps, even to a greater degree<sup>9</sup>. Second, even if the inflows of private debt had been influenced by their relative cheapening, the main factor behind the demand for foreign funds was a significant surge of domestic expenditures fed by abundant world liquidity and combined with the presence of moral hazard.

The question is whether the large inflows observed between 1978 and 1982 had a significant impact on the real exchange rate (RER) or else, if the also observed reduction in RER incited capital inflows. To disentangle this issue, we first build a simple theoretical model to explain RER followed by its empirical counterpart. Then, we look into the direction of causality. The model will serve a larger purpose to the extent that we will look into other determinants of RER than capital inflows.

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<sup>9</sup> The fixing of the nominal exchange rate in June 1979 may have been considered by the borrowers as an argument for passing to the government the risk of devaluation and, therefore, reducing the expected costs of foreign borrowing. This effect is much lower in the case of an exchange rate policy with short periods of adjustment and, nil, in a clean-float regime.

### III. THE MODEL

The analysis of the determinants of RER in Chile is based on a simple model which considers as main independent variables the degree of trade liberalization, the terms of trade, the capital inflows net of reserves accumulation, the debt service, and the gross domestic product. It also will be based on the realistic assumption of a small open economy and consequently of a price-taker. The model is essentially real with the exception derived from the incorporation of capital inflows.

The country produces and consumes three types of goods: exportables (X), importables (M) and non-tradables (N), exportables and importables conform the category of tradables (T). Since the country is small, and by the law of one price, the domestic price of the traded goods will be equal to the foreign price (with \*) and the nominal exchange rate (e). There will be a single rate of exchange. Neither tax, nor subsidies are assumed for exports; a custom duty (t) is imposed on imports<sup>10</sup>. Then the domestic price of exportables and of importables will be respectively.

$$D^* 1. \quad P_X = P_X^* \cdot e \qquad D2. \quad P_N = P_N^* \cdot e(1+t)$$

There will be two relative prices. The real exchange rate ( $\Pi$ ) may be expressed as:

$$D3. \quad \Pi_X = \frac{P_X}{P_N} \qquad D4. \quad \Pi_M = \frac{P_M}{P_N} \qquad D5. \quad \Pi = \frac{P_T}{P_N}$$

where

$$D6. \quad P_T = e \cdot P_T^* \quad \text{and} \qquad D7. \quad P_T^* = (P_M^*)^{\rho} \cdot (P_X^*)^{1-\rho}$$

<sup>10</sup>It summarizes also all natural barriers. Transport costs are inexistent.  
<sup>\*</sup>D stands for definition.

$$D.8. \quad \rho = \frac{P_M^* \cdot M}{P_M^* \cdot M + P_M^* \cdot X}$$

Weights (M and X) correspond to production of tradables.

The foreign terms of trade ( $TT^*$ ) are defined as

$$D.9. \quad TT^* = \frac{P_X^*}{P_M^*}$$

while the domestic ones (TT), as

$$D.10. \quad TT = \frac{P_X^*}{P_M^*(1+t)} \quad \text{then,} \quad D.11. \quad TT = TT^* \cdot IL$$

where  $IL = \frac{1}{1+t}$  the index of liberalization.

The supply of each one of the three categories of goods will depend on relative prices.

$$(1) \quad X^S = X^S(\Pi_X, \Pi_M) \quad \begin{array}{l} \frac{\partial X^S}{\partial \Pi_X} \geq 0 \\ \frac{\partial X^S}{\partial \Pi_M} \leq 0 \end{array}$$

combining D.2, D.4, D.10 and D.11, we obtain

$$D.12. \quad \Pi_M = \Pi_X \cdot (TT^* \cdot IL)^{-1}$$

which can be replaced in (1)

$$(1') \quad X^S = X^S(\Pi_X, TT^*, IL)$$

where  $\frac{\partial X^s}{\partial \pi_x}, \frac{\partial X^s}{\partial TT^*}, \frac{\partial X^s}{\partial IL} \geq 0$

The supply of importables will be

$$(2) \quad M^s = M^s (\pi_x, TT^*, IL)$$

where  $\frac{\partial M^s}{\partial \pi_x}, \frac{\partial M^s}{\partial TT^*}, \frac{\partial M^s}{\partial IL} \leq 0$

and, the supply of non-tradables

$$(3) \quad N^s = N^s (\pi_x, TT^*, IL)$$

where  $\frac{\partial N^s}{\partial \pi_y}, \frac{\partial N^s}{\partial IL} \leq 0; \frac{\partial N^s}{\partial TT^*} \geq 0$

The demand for each one of the three goods depends on relative prices and aggregate expenditures (E)

$$(4) \quad X^d = X^d (\pi_x, TT^*, IL, E)$$

where  $\frac{\partial X^d}{\partial \pi_x}, \frac{\partial X^d}{\partial TT^*}, \frac{\partial X^d}{\partial IL} \leq 0; \frac{\partial X^d}{\partial E} \geq 0$

$$(5) \quad M^d = M^d (\pi_x, TT^*, IL, E)$$

where  $\frac{\partial M^d}{\partial \pi_x}, \frac{\partial M^d}{\partial TT^*}, \frac{\partial M^d}{\partial IL}, \frac{\partial M^d}{\partial E} \geq 0$

$$(6) \quad N^d = N^d (\pi_x, TT^*, IL, E)$$

where  $\frac{\partial M^d}{\partial \pi_x}, \frac{\partial N^d}{\partial E} \geq 0; \frac{\partial N^d}{\partial TT^*}, \frac{\partial N^d}{\partial IL} \leq 0;$

The short term equilibrium requires equilibrium in the non-tradable market. The implicit mechanism of adjustment in this market is  $P_N$ . Consequently the equilibrium condition can be summarized by combining equations (3) and (6) and be expressed in terms of the RER for exports.

$$(7) \quad \Pi_x = \Pi_x(TT^*, IL, E, G)$$

$$\left. \frac{\partial \Pi_x}{\partial TT^*} \right|_s \geq 0; \quad \left. \frac{\partial \Pi_x}{\partial IL} \right|_s \geq 0; \quad \frac{\partial \Pi_x}{\partial E} \leq 0;$$

Where  $s$  stands for substitution effect.

On the basis of intertemporal optimization models, it is known that the level of private expenditures will be determined in each period by the intertemporal budget constraint (the present value of disposable income plus the value of financial assets in private hands) and by intertemporal preferences in consumption (reflected in the intertemporal discount rate). However, when quantitative restrictions (internal or external) exist, private expenditures will be determined only by actual disposable income (YD) and by external credit available (CE)<sup>11</sup>. Consequently,

<sup>11</sup>While external credit represents an actual constraint the dynamic of adjustment and the general equilibrium condition loose their relative importance.

$$(8') \quad E = E(YD^P, \Omega)$$

where

$YD^P$  : permanent disposable income.

$\Omega$  : private financial wealth

and

$$\frac{\partial E}{\partial YD^P} \geq 0; \quad \frac{\partial E}{\partial \Omega} \geq 0;$$

If  $R$  represents international reserves at the Central Bank

$$(A) \quad \dot{R} = (YD - E) + CE$$

defines their change and

$$(B) \quad \dot{m} = R$$

$$(8) \quad E = E(YD, CE)$$

$$\text{where} \quad \frac{\partial E}{\partial YD} \geq 0 \quad ; \quad \frac{\partial E}{\partial CE} \geq 0$$

Disposable income will be given by

$$(9) \quad YD = YD(GDP, SD, TT^*, IL, CE)$$

where SD and CE stands for debt service and capital inflows respectively.

and

$$\frac{\partial YD}{\partial GDP}, \frac{\partial YD}{\partial TT^*}, \frac{\partial YD}{\partial IL}, \frac{\partial YD}{\partial CE} \geq 0 \quad \frac{\partial YD}{\partial SD} \leq 0$$

Replacing (8) and (9) in (7) and linearizing:

$$(10) \quad \Pi_x = \alpha_1 \cdot TT^* + \alpha_2 \cdot IL + \alpha_3 \cdot GDP + \alpha_4 \cdot SD + \alpha_5 \cdot CE$$

where

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represents the change in money supply if domestic credit is inexistant. Defining the change in foreign financial assets, (AFI).

$$(C) \quad \overset{\circ}{AFI} = -CE$$

We obtain

$$(D) \quad \overset{\circ}{\Omega} = \overset{\circ}{m} + \overset{\circ}{AFI}$$

substituting (A), (B), (C) in (D)  $\Rightarrow$

$$(D') \quad \overset{\circ}{\Omega} = YD - E$$

which together with (8') means that the general equilibrium condition will be

$$(F) \quad \overset{\circ}{\Omega} = 0 \Leftrightarrow YD = E$$



$$\alpha_1 = \left. \frac{\partial \pi_x}{\partial TT^*} \right|_s + \frac{\partial \pi_x}{\partial E} \cdot \frac{\partial E}{\partial YD} \cdot \frac{\partial E}{\partial TT^*} \geq 0$$

$$\alpha_2 = \left. \frac{\partial \pi_x}{\partial IL} \right|_s + \frac{\partial \pi_x}{\partial E} \cdot \frac{\partial E}{\partial YD} \cdot \frac{\partial YD}{\partial IL} \geq 0$$

The first elements of  $\alpha_1$  and  $\alpha_2$  is the substitution effect, while the second one represents the income effect.

$$\alpha_3 = \frac{\partial \pi_x}{\partial E} \cdot \frac{\partial E}{\partial YD} \cdot \frac{\partial YD}{\partial GDP} \leq 0$$

Where  $\alpha_3$  represents the demand effect on non-traded goods. The sign of this coefficient could be ambiguous if the impact on the supply of non-tradables is considered.

$$\alpha_4 = \frac{\partial \pi_x}{\partial E} \cdot \frac{\partial E}{\partial YD} \cdot \frac{\partial YD}{\partial SD} \geq 0$$

$$\alpha_5 = \frac{\partial \pi_x}{\partial E} \cdot \left( \frac{\partial E}{\partial CE} + \frac{\partial E}{\partial YD} \cdot \frac{\partial YD}{\partial CE} \right) \leq 0$$

Using a similar procedure, we can obtain

$$(11) \quad \pi_M = \beta_1 \cdot TT^* + \beta_2 \cdot IL + \beta_3 \cdot GDP + \beta_4 \cdot SD + \beta_5 \cdot CE$$

where  $\beta_1$  and  $\beta_2$  are unambiguously negative, since the substitution effect will also be negative, and the other coefficients keep the sign of their counterpart in equation (10);

Finally, on the basis of equations (10) and (11) and the definition of the real exchange rate  $\pi$ , the following expression can be obtained

$$(12) \quad \pi = \gamma_1 \cdot TT^* + \gamma_2 \cdot IL + \gamma_3 \cdot GDP + \gamma_4 \cdot SD + \gamma_5 \cdot CE$$

with  $\gamma_1 \geq 0$ ;  $\gamma_2 \geq 0$ ;  $\gamma_3 \leq 0$ ;  $\gamma_4 \geq 0$ ;  $\gamma_5 \geq 0$ ;

Despite the remaining ambiguity of the terms associated with the terms of trade and the index of liberalization, we expect the first one to be negative while the second be positive since; it is likely that the income effect of terms of trade changes will be significative in the short term while the income effect of trade liberalization will be significative only in the long run.

#### IV. RESULTS AND IMPLICATIONS

This section presents evidences on the determinants of RER. The estimating equation for RER was

$$RER = \lambda_1 + \lambda_2 TT + \lambda_3 IL + \lambda_4 GDP + \lambda_5 SD + \lambda_6 CE + \lambda_7 CED76$$

where

- RER = real exchange rate = nominal exchange rate multiplied by the ratio of USA IPM and Chilean CPI
- TT = terms of trade
- IL = degree of trade opening
- GDP = gross domestic product
- SD = ratio of debt service to GDP
- CE = ratio of capital inflows, net of foreign reserves changes, to GDP
- D76 = dummy for period 1976-1987 for capital inflows

The main results are presented in Table 2. The sources of data used are indicated in the footnote to that table. It should be noted that for empirical purposes, RER is not directly measured by a ratio of prices of tradables and non-tradables but by a proxy consisting in the ratio of USA IPM to the Chilean CPI.

The empirical test of our simple model through ordinary least squares gives good results. The coefficients appear with their expected signs and are all significant with the exception of capital inflows for the period 1961-1975, although its T-Statistic indicates low significance. Terms of trade have an inverse impact on RER, an indication of "Dutch disease" related to copper. The coefficient is significant at 5 percent level. This result is consistent with our hypothesis related to the preeminence of income effects (in the short run) over substitution effects and it is particularly interesting for it indicates that external shocks may be quite relevant to explain the erratic behavior of the Chilean economy, particularly after 1973. As expected, the degree of openness of the economy, as measured by the relative importance of traded goods into GDP, is directly related to RER. This result is also consistent with our stated hypothesis that changes in the degree of openness has greater substitution than income effects in the short term, and relatively high substitution may exist between importables and non-tradables, as found by Sjaastad (1981) in the case of Chile.

Capital inflows do seem to project an ambiguous result: the sign is positive for the period prior 1976 and negative, as expected, after 1976. However, the first has low significance while the second one is highly significant, and the value of the parameter for that later period is twice its value prior 1976. Why this behavior and this change in trend? In the first place, it should be recalled (Section II) that capital inflows were relatively low and concentrated on the public sector up to 1974 while the opposite occurred after 1976. In the second place, there was a significant change in the composition of public expenditures as the share of public investment, with usually high tradable component, was reduced within total

TABLE 2: EQUATION FOR THE REAL EXCHANGE RATE, 1961-1987

R-Squared	0.921722
Adjusted R-Squared	0.898239
Durbin-Watson	2.2217
Number of Observations	27
F-Statistic (6,20)	39.2502

Variable	Estimated Coefficients	T-Statistics
Constant	84.16993	5.628048
Terms of trade	-0.1716447	-2.139960
Degree of openness	144.2231	4.334514
Capital inflows	203.9917	1.875991
Capital inflows: period 1976-87	-415.3770	-3.201284
Debt service	515.7895	4.966647
Gross domestic product	-0.8201805 E-04	-1.403451

## Sources and definitions

Real exchange rate	:	de la Cuadra and Hachette, 1987 Central Bank of Chile, Boletín Mensual
Terms of Trade	:	de la Cuadra and Hachette, 1987. Central Bank of Chile, Cuentas Nacionales
Degree of Openess	:	de la Cuadra and Hachette, 1987. Central Bank of Chile, $\frac{(\text{Exports (US\$ current)} + \text{Imports (US\$ Current)}) \times \text{Nominal Exchange Rate}}{\text{GDP (current \$)}}$
Capital inflows	:	Central Bank of Chile, <u>Deuda Externa, 1987</u> this variable, obtained in US\$, was transformed in \$ and then related to current GDP.
Debt service	:	Central Bank of Chile, <u>Deuda Externa, 1987</u> , The same method as for the previous one was used for this variable.
Gross domestic product	:	Central Bank of Chile. Cuentas Nacionales and Boletín Mensual. This variable was expressed in constant 1977 \$

public expenditures after 1974. Consequently, public expenditures were more concentrated on non-tradables in the last decade. A variant of this argument may be presented as followed.

The decade of the late seventies and early eighties has shown a lower investment ratio than the previous period covered here, and it is realistic to assume, although we cannot show any definite evidence to that respect, that investment is relatively less intensive in non-tradables than in tradables. This would imply that expenditures, financed by capital inflows for ex, would pressure the price of non-tradables relatively more now than before 1976. In the third place the capital market, repressed before 1976, was quickly liberalized after that date. Although, it may be difficult to find a distinct relationship between this phenomenon and RER, given the large number of cross-effects on demand and production of different categories of good, we should point out, that its liberalization may have clearly favored non-tradables (commerce and services in particular) for which there was hardly any credit at all prior to 1970, a period of controlled and sectorialized credit.

The debt service has had a direct and significant impact on RER. Its parameter is significative at a 1 percent level. The direction of the impact results, as postulated in the model, from the reduction in expenditures caused by the increasing debt service in the seventies and eighties and consequently, the reduction in demand for non-tradables. Finally, the gross domestic product presents a negative sign but with low significance, both resulting of expected contradictory effects of this variable which can affect both demand and supply of non-tradables. Here, apparently the demand related impact dominantes.

One of the authors, in an attempt at explaining the behavior and determinants of the trade balance, has found support for the inverse relation between capital inflows and RER (Cabrera, 1988). Using a more general and larger model than ours, he derives six reduced form equations which he proceeds to estimate simultaneously for the exchange rate, the current account, the foreign exchange gap, the fiscal deficit, public expenditures in non-tradables and the degree of trade opening by using three stages least squares. The equation estimated for RER during the period 1952-1982 is

$$\begin{aligned}
 RER = & 1,364 + [2,01 + 0,792] \cdot DP - 2,837 \cdot D1 - 1,836 \cdot D2 \\
 & \quad (6,68) \quad (1,47) \quad (3,25) \quad (-2,42) \quad (-1,49) \\
 & - 1,62 \cdot D3 - 0,341 \cdot D4 + 0,761 \cdot IL - 0,102 \cdot \dot{P} \\
 & \quad (-1,35) \quad (-0,21) \quad (5,89) \quad (-4,13) \\
 & - [0,792 - 0,947] \cdot TP^* - 1,126 \cdot ID + 0,057 \cdot \dot{e} \\
 & \quad (3,25) \quad (3,56) \quad (-5,65) \quad (4,29) \\
 & + [-1,126 + 0,083] \cdot TT - 0,792 \cdot CE + 0,0061 \cdot BC \\
 & \quad (-5,65) \quad (5,23) \quad (3,25) \quad (1,59) \\
 & - 0,025 \cdot TI^* \\
 & \quad (-0,91)
 \end{aligned}$$

$$R^2 = 0,99 \quad ; \quad DW = 2,21$$

where

RER = real exchange rate

DP = ratio of public sector deficit to GDP

D1 a D4 = dummies for DP

IL = degree of trade liberalization

$\dot{P}$  = rate of inflation

$TP^*$  = ratio of inflation tax to GDP

ID = ratio of disposable income to GDP

$\dot{e}$  = rate of change of the exchange rate

TT = terms of trade

CE = ratio of external credit to GDP

BC = foreign exchange gap

$TI^*$  = US interest rate

The estimated coefficients reveal the existence of a significant inverse impact on RER of disposable income and terms of trade. It should be noted that the variable terms of trade is preceded by two coefficients : the first one represents the net impact of disposable income over RER while the second represents the effect of terms of trade over disposable income. As expected, and confirming the results of our model , capital inflows did have a significant inverse relationship with RER both through lifting liquidity constraints -then stimulating consumption- and through reducing the domestic interest rate and then incentivating investment. Since the author does not distinguish between the period from 1976 on with the rest of years covered since 1952, it is impossible to infer the existence of a significant difference of effects of capital inflows across periods. The impact of liberalization on RER is positive and highly significant as in our model, result which is consistent with the presence of a higher substitution effect in the short term than an income effect of that variable. The positive and significant coefficient obtain for the rate of change in the nominal exchange rate can be attributed to the contractive impact of devaluations on aggregate expenditures. The negative impact obtained for the rate of inflation is derived from the indization of wages while the positive effect of the inflation tax came through its inverse relationship with private expenditures . Finally, since fiscal deficits may have different impacts on RER according their financing composition and collateral policies such as price controls; this is reflected in the ambiguous sign obtained while dummies , with one exception, were non-significant. On the whole, the results obtained for a slightly different period, with a totally different model than ours, are fairly consistent with the hypothesis that capital inflows and RER were clearly inversely related during the period of financial market liberalization.

## V. MAJOR IMPACTS OF THE CAPITAL ACCOUNT OPENING

The opening of the capital market produced several impacts: on the financial industry, on the interest rate, on the structure and level of foreign indebtedness and on the relevant

debt service, on the composition of firm liabilities and there financial viability, etc. However, its main impact may have been on the level of domestic expenditures, on the trade balance, on the real exchange rate and, through it, on the structure of production, the level of employment and the composition of demand of foreign trade. The objective of this paper is not to analyze all these issues, but to look into possible relationships between capital and trade liberalizations. This relationship has been postulated in the previous sections to be through the impact of capital inflows on RER. The issue will be pursued in the first part of this section, followed by a brief description of the most likely impacts of the capital account liberalization.

### On Relative Prices

The rapid inflows of private capital financed growing trade deficits, and this would have occurred independently of the domestic composition of production and of trade liberalization efforts. In fact, if the country had produced only tradables at international prices, the trade deficit would have occurred, even without changes in relative prices -- a pure income effect<sup>12</sup>. To avoid inflationary pressures, authorities may be even willing to liberalize the trade account. Then, one way or the other, capital inflows could be the cause of a trade deficit<sup>13</sup>, not the consequence. So, the question of a possible relationship between the two openings cannot be analyzed by merely observing the trade balance performance. The hypothesis is that a relation may exist between both through the impact of the capital liberalization on domestic relative prices which could then influence both timing, consequences of trade liberalization, and the proper sequencing of both liberalizations.

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<sup>12</sup> I owe this point to Fernando Ossa. The case of Uruguay would probably be a good example of this hypothesis.

<sup>13</sup> Of course, one alternative would be that capital inflows finance capital outflows as in Argentina during the same period; then, the impact on trade balance would be lessened.



Foreign capital inflows were instrumental in lowering the real exchange rate. The mechanism, described above, was a private sector deficit induced by optimistic expectations with respect to future wealth and income transformed into a demand for foreign credit. As the deficit was increasing, so was the rate of capital inflows, *pari passu* with the gradual opening of the financial market. Of course, all this occurred in an environment of increasing world liquidity, an important ingredient not analyzed here. As these inflows financed domestic expenditures on non-tradables (on top of imports), with a fixed nominal

TABLE 3: SOME INDICATORS FOR THE PERIOD 1979-82

	Real Exchange	<u>Tradables</u> Non-Tradables	<u>Tradables</u> Wages	Employ- ment (rate of growth) Total	Tradables	Exports (rate of growth)	Imports (rate of growth)	Terms of trade (rate of change)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1979	100.0	1.032	1.022	2.3	-1.4	19.0	-2.6	6.8
I		0.955	1.003					
II		1.000	1.000					
III		1.132	1.051					
IV		1.042	1.032					
1980	90.9	0.973	0.838	3.5	1.3	0.2	15.7	-14.8
I		1.025	0.920					
II		1.004	0.864					
III		0.966	0.832					
IV		0.895	0.736					
1981	81.3	0.763	0.617	5.1	-0.5	-5.8	41.3	-15.7
I		0.845	0.687					
II		0.780	0.631					
III		0.726	0.579					
IV		0.702	0.569					
1982	86.1	0.800	0.702	-12.1	-12.5	15.4	-14.7	-4.7
I		0.649	0.542					
II		0.660	0.549					
III		0.886	0.755					
IV		1.003	0.963					

Note: The real exchange rate is equal to the nominal rate deflated by the GDP deflator and multiplied by the wholesale price index of the US.

Source: De la Cuadra and Hachette (1987).

exchange rate between 1979 and 1982, their prices rose, and the real exchange rate fell. At least for institutional reasons, wages suffered from downward inflexibility (Table 3) at the time, so the adjustment could not come through a reduction of prices of non-tradables<sup>14</sup>. It should be underlined here that this change in relative prices would have occurred anyway with flexible exchange rates. It is even likely that in this context, the changes would have been perhaps quicker but also more pronounced.

Our empirical results suggest that capital inflows and RER are inversely correlated. But, what is the direction of causality? Evidence on this issue is given by Morande (1986). The author confronts two competing hypothesis: one claiming that causality went from the real exchange rate (affected by the nominal exchange policy) to the capital inflows, and the second, the other way around. His empirical work supports the second hypothesis, which has been sustained all along this paper. Although his test is not fully conclusive, it fits also with "the impressions of policy-makers at the time". Edwards' test of the second hypothesis reaches the same results (Edwards, 1988). As the peso was appreciating, production and employment in tradables decreased, imports were further stimulated, and even the rate of growth of GDP was hindered. The rise in expenditures was growingly spent on tradables. But the above would have happened anyway, independently of the exchange rate regime. In fact, with a simple experiment, he reaches the conclusion that capital inflows would produce an accumulated real overvaluation exceeding 20 percent after three years. And the same author has suggested elsewhere (1984) that, if floating, the equilibrium exchange rate would have fluctuated between \$25 and \$27-while the fixed one was \$39. Harberger (1982) has also estimated that capital inflows could explain a real appreciation of the peso of up to 25 percent between 1979 and 1981. The fixed exchange rate was a mere circumstance which played only a secondary role in the described developments but which nevertheless has confused issues and conclusions.

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<sup>14</sup> The magnitude of the adjustment required would have been such that it could not depend only on the reduction of wages.

However, the fixity of the nominal exchange rate became crucial when, in 1982, capital flows came tumbling down.

Some have argued that the fixed exchange rate was the main factor behind the inflows (Dornbusch, 1986, Corbo, 1988, French-Davis, 1984, and Ramos, 1988). Counterarguments have been presented here. They do not deny some feedback of the exchange rate policy chosen at the time because of the exchange risk reduction it implied. However, it has been shown that this factor was far from being the only relevant factor for most of the period observed. Moral hazard was most probably the leading factor behind risk-taking (one of the determinants of the inflows) between late 1980 and 1982. Moral hazard reduced the importance of the fixity of the nominal exchange rate in this endeavor. Consequently, in its presence, even a flexible exchange rate would not have made much of an inroad in the significance of the private foreign inflows at that time.

### **Some Indirect Impacts**

Capital inflows had many impacts among which the most outstanding were<sup>15</sup> (Table 3):

(i) A trade surplus of 18.7 percent of imports in 1976-1977 shifted to a growing deficit of 11.0 percent and 28.1 percent of imports in 1978-1979 and 1980-1981 respectively. This trend was the obvious consequence of the rapid growth of imports and reduction of exports. From 23 percent of GDP in the period 1974-1979, imports jumped to 31.9 percent in 1980-1981. The relation between the real exchange rate and exports and imports behavior is validated empirically by Cabrera (1988) and Desormeaux and Bravo (1986).

(ii) As expected, the share of tradables into GDP diminished by more than 3 percentage points in 1980-81 as compared to 1976-1977.

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<sup>15</sup>For more details, see de la Cuadra and Hachette (1987).

(iii) The growth of employment in tradables almost stopped during the period of high capital inflows and falling real exchange rate while the most important loss in manufacturing employment occurred concomitantly. However, this is the period of highest increases in real wages -- 90 percent, at constant prices, between 1979 and 1981. Combining this trend with the observed reduction in the relative prices of imported capital goods, one finds a good explanation for the reduction in the total employment in manufactures. The presumption is confirmed by the results showing a dominant substitution effect over a scale effect, both working in the same direction for the industry as a whole. On the other hand, the availability of credit to troubled firms, financed through capital inflows, postponed required adjustments and higher unemployment. In fact, the plentiness of financing may have encouraged new investments, but it also stimulated overborrowing to avoid major adjustments and likely bankruptcy.

(iii) Industrial production was reduced in the period 1980-81 due to a significant price effect, essentially derived from the reduction in the real exchange rate. This negative impact could not be explained by tariff reduction since, at that time, tariffs remained constant at a level of 10 percent. The positive dynamic effects of trade liberalization were not sufficient to compensate for the negative pressures on production stemming from appreciation of the currency or real wages increases. The price effect was very significant in all manufacturing sub-sectors but three (food products, beverages and tobacco);

(iv) The rate of growth of agricultural exports which had been positive and extremely high between 1975 and 1979, was reduced during 1980-81;

(v) The most notorious change in the composition of trade is the significant hike in the share of consumption goods into total imports -- from 14.6 percent in the period 1974-79 to 27.2 percent in 1980-81. This trend is consistent with (a) the critical growth in expenditures combined with large increases in employment and real wages (income effect), (c) the reduction

in the relative prices of imported goods (price effect) (d) an adjustment to a significant stock disequilibrium in durables existing when trade liberalization started in 1974, accompanied by the lifting in the liquidity constraints during the financial liberalization, particularly when the opening to the foreign capital market accelerated after 1978<sup>16</sup>. Then, although the reduction in the cost of imports may have had an influence on their rapid increase, it is far from being the only relevant factor and even on being the main one to explain the trend.

(vii) Capital inflows reduced the inflationary impact of continuous devaluations by supporting the nominal exchange rate fixity between 1979 and 1982. However, by financing rapidly increasing expenditures, they fueled the rise of non-tradable prices at a rate over 30 percent per year up to 1982, despite increasing fiscal surplus at the time. The inflation rate fell to international levels only when, in 1982, the reduction in domestic expenditures coincided with a significant reduction in capital inflows, particularly after June of that year.

## VI. CONCLUSIONS

Trade was liberalized before the capital account. Trade liberalization reached its peak in June 1979 while the capital account became semi-opened by 1979 and was fully opened on the inflows side only by June 1982. Was it an adequate sequencing?<sup>17</sup> The adequacy will depend on considerations of costs and benefits. To the extent that the sequencing does not generate externalities or distortions and that factors are perfectly mobile, any order of liberalization is proper. This obviously was not the case. Within the framework of this paper, with a major preoccupation for trade liberalization in the background, adequacy could be defined in relation to the success of trade liberalization. The sequencing could be considered as adequate if, at least, it allowed trade liberalization to be successful, that is if resources could move in a

<sup>16</sup> This hike, concentrated in durables, has been justified elsewhere. See Dornbusch, 1985.

<sup>17</sup> For theoretical arguments, see Edwards (1984).

coherent way with comparative advantages, if exports -particularly, non-traditional- could be stimulated, and finally, if trade liberalization was not reverted. Given these criteria, the order of liberalization was adequate, at least on the surface. However, the Chilean experience suggests additional comments related to pros and cons to open the capital market first.

The reverse sequencing could have been suitable. A successful trade liberalization required that resources be reallocated to sectors with greater comparative advantages which would be the consequence of changes in relative prices. However, the new relative prices should be relatively stable to stimulate investment in the relevant sectors and to avoid costly allocation reversals. These relative incentives would have to be, in the medium and long term, those of the steady state which implied "equilibrium or normal" capital inflows. Equilibrium in the good market consistent with it would then occur at a lower real exchange rate than in the absence of capital inflows. But, this factor should be taken as given for trade liberalization purposes. On this basis, the capital account should then be liberalized first. The question of the impact of abnormal inflows on the proper sequencing will be discussed below.

A successful trade liberalization required also high resource mobility to lessen the costs of adjustment and to reduce the probability of reversal. The improvement in the working of factor markets became consequently a major endeavor in the process of liberalization of the economy. The liberalization of the capital market, of which the opening of the capital account is an important ingredient, would then be a pre-condition for a smoother trade opening. The capital market was particularly repressed in 1974 and had never undergone any substantive development before that date. It then required critical changes before being able to support efficiently a significant resource reallocation. On this account, and despite the relatively higher speed of adjustment of capital markets than the good markets, liberalization of the capital account should have come first. In practice, the only way to do it would have been to increase the opening speed. However, for reasons presented in Section II, the foreign capital market was de facto closed to Chilean borrowers up to 1977. Consequently, the only impact of a

change of speed could have been higher inflows than otherwise only in 1978-1979. This trend would have accelerated the reduction of RER which had already started in 1977. But to the extent that inflows had been, in this scenario, long run equilibrium ones, the timing of these changes in relative prices could have been adequate for purposes of efficient long run resource reallocation.

On the other hand, and as a consequence of the severe recession suffered by Chile in 1975 without any possibility to buffer serious losses in exports with foreign inflows as a consequence of the low creditworthiness of the country, RER overshooted and could certainly not remain at the high level reached by early 1976 even with a closed capital account. Consequently, a more rapid opening of this account could have only accelerated the returning of RER to more stable and long run equilibrium levels without any necessary negative impact on resource allocation. Then, again, the presence of overshooting of RER could have been another argument in favor of opening the capital account sooner than later.

The main argument to reverse the sequence of liberalization efforts, that is trade opening first, could be related, at least within the context of the Chilean economy, to the need of export development and diversification, main feature of a successful trade liberalization, as defined here. It appears that exports required a special boost given the tradition of a closed economy and of the high export concentration on one product (copper). The infant industry argument could be used to justify such a boost, although it could have come through different kinds of incentives - administrative, subsidies, legal and marketing support, appropriate institutions, related infrastructure, credit availability, etc. But, most of them required time to be prepared and to become effective. Then, an undervalued domestic currency was in principle, and in practice more efficient as it had an immediate stimulating impact while giving time to prepare alternative or complementary measures to higher RER than otherwise. Then the relatively closed capital account until 1978-1979 gave a welcome push to exports and to their diversification. When the opening of the capital account started

making inroads on RER , the desirable alternative and complementary measures became available: low tariffs reducing substantially the implicit tax on imports existing previously, opening of several markets (geographical and for new products), greater availability of export credit. So, on this account, liberalizing trade in first place was appropriate.

There are no doubt left with respect to several negative impacts that massive capital inflows had in 1980 and 1981 (see above). Were there reversals in resource allocation? We do not have any direct evidence with the exception of the increase in the ratio of non-tradables to GDP. However, it is likely that investment in tradables was lower than otherwise. Dispersed evidence suggests that a large share of foreign resources went to finance construction. The growing indebtedness of industrial concerns between 1980 and 1982 is also consistent -although not conclusive- with the existence of pressures towards reversals. But were capital inflows in 1980 and 1981 normals? If abnormal, was this important for the proper sequencing of liberalization?

In the absence of a proper estimate of optimal capital borrowing, one doubt can put forward. It is difficult to believe that a sudden change in inflows resulting in a significant leap of the ratio of external savings to domestic investment from an annual average below 20 percent over two decades to 33.8 percent and 63.9 percent in 1980 and 1981 respectively be one of equilibrium or even of adjustment to a new equilibrium level of inflows. Inflows were most probably over "normal" levels during that period. Further, they would have created resource reallocation independently of their timing. If occurring before trade liberalization, they would have accelerated the reduction of sectors which would have been negatively impacted by trade liberalization; but, so would have occurred with exports and some import substitutes which would have gained with trade liberalization. If occurring after, the abnormal inflows would have produced a symmetrical phenomenon by hindering those sectors which would have gained with trade liberalization. In which case costs would have been higher, is



anybody's guess. So, abnormal flows do not seem to offer any interesting light to support one order of liberalization or another.

Concluding, it should be noted that the analysis and conclusions are blurred by the abnormality of the situation both in Chile and in the world markets at the time of trade and capital account liberalizations. Abnormality in Chile due to the unexpected behavior of aggregate expenditures between 1977 and 1981 which coincided with a singular world liquidity. In normal conditions, it is likely that the actual degree and speed of opening of the capital account would not have made much impact on the trade liberalization efforts even if opened after the trade account. In the actual circumstances, the order resulted adequate while the speed of opening of the capital market should have been slower and its degree lower as it clearly overshooted over its steady state flow, at least in 1980 and particularly in 1981. Finally, the context of the Chilean experience may suggest that the question of the proper sequencing may be a spurious one given the political restriction. Time to make structural changes may be so limited that both efforts of liberalization should be carried out simultaneously. We have shown, in our context that, in the absence of abnormal flows, it could have been a desirable outcome.

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