

THE CHILEAN STABILIZATION PROGRAM
FROM MONETARIST ORTHODOXY TO
EXCHANGE RATE MANAGEMENT

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CHAPTER 2

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CHAPTER 2

The Stabilization Program:From Monetarist Orthodoxy to Exchange Rate Management

In October of 1973 the military government announced that the reduction of inflation -- which had exceeded 600% in the previous 12 months -- was one of its main economic goals. During the next 8 years the government combated inflation using a variety of tools. Eventually inflation subsided, and, as can be seen from Table 2-1, in 1981 it was at the one digit (9%) level for the first time since 1964.¹

Other important short-run objectives stated by the government in late 1973 were the eradication of black markets and food shortages, the reduction of government controls, the reorganization of the productive sector, and the avoidance of a major balance of payments crisis. As part of the initial policy package aimed at achieving these goals the government implemented a rationalization of the exchange rate system, and a massive devaluation was implemented in late 1973.² Prices of many goods were decontrolled, and measures to reduce tax evasion were also undertaken. As an immediate result of the devaluation and of the relaxation of price controls, the official monthly rate of inflation increased in October of 1973 to 87.5%, an exorbitant figure which amounts to an annualized inflation rate of over 189,000%.

During the first 18 months of the regime some of these objectives were partially achieved -- relative prices were realigned, a balance of payments crisis was avoided, and government finances were somewhat straightened. Also during this period the initial steps towards liberalizing some of the key economic sectors -- domestic capital markets and international trade -- were undertaken, and some firms nationalized during the UP government began to be privatized.

TABLE 2-1

Rate of Inflation in Chile: 1970-1984

(Rate of change of the Consumer Price Index: December to December)

	<u>Percent</u>
1970	34.9
1971	22.1
1972	487.5
1973	605.9
1974	369.2
1975	343.2
1976	197.9
1977	84.2
1978	37.2
1979	38.0
1980	31.2
1981	9.9
1982	20.7
1983	23.1
1984	23.0

Sources: From INE for 1970-72 and 1979-84, and from Cortazar and Marshall for 1973-78.

Although the reduction of inflation had been termed the main objective of the government's short-run economic policy, until April of 1975 a relatively timid gradualist anti-inflationary approach was deliberately followed. The decision to adopt this gradualist policy was based on the supposed costs of an abrupt alternative and was rationalized in the Minister of Finance's 1974 Report on the economic conditions of the nation (Mendez 1979, pp. 103-04):

The first decision in the anti-inflationary policy consisted in adopting a gradualist point of view instead of one of violent containment....To detain inflation suddenly would imply the immediate elimination of the fiscal deficit, and the reduction of credit to the private sector....A simple analysis of these measures gives us an idea of the catastrophic consequences of this type of [abrupt] policy....[T]he social cost, in terms of loss of production, employment and income from an [abrupt anti-inflationary] economic policy...would be very high and we are sure the majority of Chilean[s] would not be willing to accept it.

The gradualist character of the policy was mainly reflected in the behavior of monetary growth. In June of 1972 the rate of growth of money (M1) stood at an annual rate of 333%, only slightly lower than the most expansionary month of the Allende regime -- 342% in August of 1973. On the fiscal side, however, fairly substantial progress was made. The fiscal deficit, which in 1973 reached the unprecedented level of 24.6% of GDP was reduced in 1974 to 10.5% of GDP. Most of this reduction was attained via lower government expenditure -- the ratio of expenditure to GDP was reduced from 45% of GDP in 1973 to 32.4% in 1974 -- achieved through a combination of measures, including the elimination of most subsidies, and the firing of a substantial number of civil servants (according to Decree Law 534 more than 50,000 government employees had to be fired in a period of 18 months.) However, the most important source of decreased expenditure was the sale to the private sector of a number of ailing firms owned by the government. Some of these industries had been nationalized during the Allende government and most of them were in a precarious financial condition, and required permanent

injections of fresh funds from the government. As discussed in Chapter 4 below, in its effort to get rid of these firms fast, the government many times sold them at prices well below their economic value.

Another important characteristic of the initial stabilization effort -- which was to be maintained throughout the experiment -- was the reluctance to use any type of price controls or guidelines. The government view on this subject is clearly reflected in the already quoted 1974 Minister of Finance report (Mendez 1979, p. 105): "A particular inappropriate tool for restraining inflation...is price controls. As long as the inflationary pressures generated by fiscal deficit and excessive monetary expansion are not eliminated, it is impossible to prevent price levels from increasing". Of course, this reluctance to use price controls -- or other forms of income policies -- stemmed from Chile's long history of unsuccessful attempts to curb inflation using these types of policies. The most recent of these attempts, the failed UP stabilization effort of 1972, was still fresh in the minds of the military authorities. In particular, the effects of a repressed inflation situation -- including generalized scarcity, black markets, and the possibility of rationing -- had been very traumatic.

In spite of the gradualist stabilization policy, and of the stated desire of avoiding an excessive "social cost" in reducing inflation, the rigor of the fiscal measures began to be felt in the economy by late 1974. In October, industrial production fell to 12% with respect to October of 1973; in November and December further reductions in manufacturing output at annual rates of 11% and 12% took place. On average, industrial production declined by almost 4% during 1974. Unemployment also experienced a marked increase late in that year. In September the rate of unemployment in the greater Santiago area had reached 8.4%, drastically up from the 4.1% rate of September of 1973.

Perhaps not surprisingly given the relatively lax monetary policy followed during this early period, in 1974 the stabilization program only made very limited progress in attaining its goal of reducing inflation. At the end of the year the rate of inflation stood at 370%. Moreover, during the first quarter of 1975, while the level of output continued to decline, inflation began to experience an alarming upward trend, with the official rate of change in the consumer price index being 14% (per month) in January, 17% in February, and 21% in March. At this time the deterioration of the terms of trade made things even more complicated, as the projected deficit in the balance of payments for 1975 as a whole was alarmingly high. In a way Chile was in the worst of worlds. On one hand, the gradualism of the stabilization effort was clearly failing to reduce inflation, and on the other hand the measures undertaken on the fiscal side were impacting in a negative way production and employment. The Chilean economy was paying the costs of a stabilization program without getting any of its benefits.

2.1 The Closed Economy Approach to Stabilization: 1975-1977

In April of 1975, and due to the very slow progress achieved until that point, the gradual approach to anti-inflationary policy was abandoned, and the so-called "shock treatment" began.³ On the 24th of that month, Finance Minister Joge Cauas -- a Columbia University trained economist and former World Bank senior staff member -- announced on national television that the government had declared a frontal war on inflation. In this speech Cauas noted that General Pinochet had asked him to "design and carry out an economic program with the fundamental purpose of erradicating the inflation that has affected our country for more than seventy five years..." (Mendez 1979, p. 157). This program was based on traditional views regarding abrupt economic stabilization and called for a drastic reduction in inflation in one

year. The main characteristics of the program were: (a) an across-the-board reduction in government expenditure (between 15% and 25%); (b) a 10% temporary hike in income taxes; (c) an acceleration of the program of reducing the size of the public sector, which had begun in 1974; and (d) a tight monetary policy. Table 2-2 presents data on inflation and stabilization during the 1970s and early 1980s.

In designing and applying the "shock" anti-inflationary policy, social cost consideration which had greatly preoccupied Minister Cauas in 1974, were completely set aside. This change in attitude was partly due to the fact that, as noted, the economy was already incurring in some of the costs of stabilization without reaping any substantial benefits, and partially due to the recognition that given the character of the government -- military dictatorship -- the economic costs of disinflation had little, if any, political consequences.

On the fiscal side the "shock" anti-inflationary program was aided by a sweeping tax reform enacted in March of 1975. The main purposes of this reform were to generate a substantial increase in tax revenues, and to reduce the efficiency distortions generated by the old system. The principal features of this reform includes the replacement of a cascade-type sales tax with a flat rate value added tax at a 20% rate; a full indexation of the tax system; an elimination of the remaining tax exemptions and subsidies; a unification of the corporation and non-corporation income taxes into a flat business tax; and the integration of the personal and business income taxes.⁴ As may be seen in Table 2-2 the combination of increased tax revenues and reduced government expenditure rapidly impacted the fiscal deficit which declined from over 10% of GDP in 1974 to 2.6% in 1975 and to less than 1% in 1978. In the years that followed, and for the first time in more than twenty

TABLE 2-2

Table 2

Year	(A) Inflation Rate % (December/ December)	(B) Government Expenditure 1977 Millions of US \$		(C) Government Revenue 1977 Millions of US \$		(D) Fiscal Deficit 1977 Millions of US \$		(E) Rate of Growth of M1 % (December/ December)		(F) Proportion of Total Credit Received by Government	(G) Rate of Devaluation of Pesos % (December/ December)	(H) Balance of Payments (Millions US \$) a/
		Millions of US \$	% GDP	Millions of US \$	% GDP	Millions of US \$	% GDP	Rate of Growth of M1 % (December/ December)				
1970	34.9	3681	28.1	3301	25.2	380	2.9	--	.56	20.0	--	
1971	22.1	4633	32.4	2989	21.2	1644	11.2	110	.69	33.3	--	
1972	487.5	4540	32.2	2637	18.7	1903	13.5	157	.77	56.3	--	
1973	605.9	5990	44.7	2693	20.1	3297	24.6	317	.88	1340.0	-21	
1974	369.2	4374	32.4	2957	21.9	1417	10.5	272	.85	419.4	-55	
1975	343.2	3206	27.4	2902	24.8	304	2.6	258	.85	354.5	-344	
1976	197.9	3148	25.8	2867	23.5	281	2.3	194	.75	104.9	414	
1977	84.2	3337	24.9	3095	23.1	242	1.9	108	.59	60.5	113	
1978	37.2	3451	23.8	3335	23.0	116	.9	67	.40	21.4	712	
1979	38.0	3627	23.1	3878	24.7	-251	-1.7	65	.29	14.9	1,047	
1980	31.2	4200	25.0	4284	25.5	-84	-.6	57	.10	0.0	1,244	
1981	9.5	4195	23.7	4726	26.7	-531	-3.0	-60	.02	0.0	70	
1982	20.7	4379	29.0	4032	26.7	347	-2.3	9	.07	88.3	-1,165	

1983

Sources: Column (A) is taken from INE for years 1970-1972 and 1979-1982, and from Cortazar and Marshall (1980) for 1973-1978. Columns (B) through (D) are taken from *Exposicion de la Hacienda Publica, 1981*; Columns (E) and (F) are taken from *International Financial Statistics* (Columns (G) and (H) are taken from *Indicadores Economicos y Sociales 1960-1982 and from IFS. Column (G) refers to the peso vs US\$ exchange rate.*

a/ A minus sign means deficit. Data for 1970-1972 is not available because in 1980 the Central Bank changed the way balance of payment statistics are recorded.

years, Chile experienced a fiscal surplus. This situation only changed in 1983 when in the midst of the recessive crisis the reduction of tax collection generated a small deficit.

The stabilization effort of 1975 also relied on a tighter monetary policy. Although as Harberger (1982) has pointed out it can hardly be said that there was a monetary crunch, during the initial phase of the "shock" stabilization program the control of monetary aggregates was a central aspect of the overall policy, and the Central Bank made serious efforts to control the rate of growth of domestic credit. In particular, in 1975 the monetary tightness was significant, with the real quantity of money (M1) declining almost 20% in relation to the previous year.⁵

The April 1975 stabilization program was largely based on traditional monetarist views regarding inflation in closed economies, and considered that money creation to finance the fiscal deficit was the basic and most fundamental cause of inflation. This position was consistent with the diagnosis made by some of the government technicians before the coup. A document elaborated during the UP government by a group of economists, then in the opposition, stated that since Chile was largely a closed economy, the control of inflation required (only) the reduction of the fiscal deficit, and a tight monetary policy.⁶ The government's view on the inflation, and on its eradication are clearly summarized by the following quote from Cauas (Mendez 1979, p. 109):

The monetary policy that we have been applying recognizes that there is a close relation between the Rhythm of growth in the level of prices and the rate of expansion of month supply....The high degree of sensitivity of the money supply to variations in the fiscal deficit necessarily implies that the success of this policy is intimately bound to the maintenance of solid discipline in fiscal matters.

Consistent with the belief that fiscally induced money creation was the most fundamental cause of inflation, the April 1975 stabilization program did not consider using the exchange rate as an anti-inflationary tool. In fact it was decided to maintain a crawling peg exchange rate system that consisted on periodically adjusting the nominal exchange rate at approximately the same rate as lagged inflation.⁷ As Minister Cauas himself put it in his April 24th speech, "the exchange rate shall continue to be adjusted in relation to domestic prices" (Mendez 1979, p. 161). The motivation behind this policy was the desire to maintain a stable, and "realistic" real exchange rate that would encourage non-traditional exports, and help the adjustment process following the import tariff reduction that was already underway.⁸ In fact, as may be seen in Table 2-2 during 1975 the rate of nominal devaluation of the peso with respect to the U.S. dollar exceeded the rate of inflation (354% versus 343%).

In terms of wage rates policy, the April 1975 stabilization program called for prudence. Although Cauas asked wage earners to share in the "sacrifice", he also pointed out that the policy of automatic periodic wage adjustments approximately based on past inflation, which had been started in 1974, would continue. In fact, as a result of this policy, during 1975 real wages experienced an increase of 6.5%. (See Chapter 6 for a detailed discussion of wage behavior.)

The 1975 "shock" stabilization program promptly impacted on inflation, with the rate of growth of prices declining from 69% in the second quarter of 1975 to 26% in the fourth quarter of 1975. On the production side, the immediate short-run effect of the stabilization program was to aggravate the already serious crisis, generating a large reduction in the level of economic activity in 1975. The fiscal shock plus the sharp decline in Chile's terms of trade resulted in a reduction of GDP in 1975 of 12.9%, and in a steep increase

in the rate of unemployment to almost 20% in September of that year. Even though the economy rapidly began to recover after 1975, with real GDP reaching its 1974 level in 1977, unemployment remained at extraordinarily high levels throughout the period.

In spite of the initial success of the "shock" stabilization program, by early 1976 it seemed that even though the major source of money creation -- the fiscal deficit -- had been greatly reduced the rate of growth of prices was regaining its old pace, with the rate of inflation climbing, in the first quarter of 1976, to 47 percent.

With the fiscal deficit under control, and a lower rate of growth of money, inflationary expectations began to play an increasingly important role in the perpetuation of inflation. In fact it seemed that inflationary expectations had been stabilized at a level of around 200 percent per annum. It also became clear at the time that the behavior of the exchange rate had become an important element in the process of formation of inflationary expectations.⁹ Not too surprisingly, given the long inflationary tradition of the country, the public had quickly realized that inflation and nominal exchange rate devaluation were closely linked; bankers, businessmen and housewives increasingly began to look at the exchange rate to form their expectations of inflation. In June of 1976, and as a means to break inflationary expectations, the government revalued the peso by 10%. Following this revaluation the process of minidevaluations, where the nominal exchange rate (with respect to the U.S. dollar) was adjusted at approximately the same rate as past inflation, was reassumed. In March of 1977, and in order to further break expectations, the nominal exchange rate was again revalued by 10%.

During 1976 and 1977 substantial progress was made in the battle against inflation. The rate of increase of prices had been reduced almost by half in

each of those years (see Table 2-2). However, by late 1977 inflation was still very high in absolute levels, 87%.

The revaluation of the peso of 1976 and 1977 marked the first steps towards a major change in the Chilean stabilization strategy, and in the authorities conception of the role of macroeconomic policy. In late 1977, with the rate of inflation standing at a yearly level of 84%, the government authorities argued that given the increasingly open character of the Chilean economy, traditional anti-inflationary programs based on closed economy premises were becoming clearly ineffective. It was then pointed out that a drastic change in the orientation of the stabilization policy was required to make further progress against inflation.

2.2 Open Economy Monetarism

In January of 1978 the manipulation of the exchange rate completely took over as the most important anti-inflationary tool. At that time a novel policy of preannouncing a declining rate of devaluation for a fairly long period of time (up to a year) was introduced as a way of further reducing the reate of inflation. This system, popularly known as the tablita, deliberately set the starting declining rate of devaluation at a lower rate than ongoing inflation. With the trade reform having substantially reduced most import barriers, it was expected that this system of preannounced devaluations would work in a way similar to a textbook-type fixed exchange rate regime, where the law of one price holds. Consequently, it was thought that domestic inflation would rapidly converge to the level of world inflation plus rate od evaluation of the peso. In addition to this international goods arbitrage-type effect, it was expected that the declining preannounced rate of devaluation would continue to reduce the expectations of inflation.¹⁰

The new open economy approach to stabilization policies was highly influenced by the simplest version of the monetary approach to the balance of payments (MABP). This view, which enjoyed short-lived popularity in the U.S. and other academic circles during the early 1970s, focuses on the relation between the economy's balance of payments and its monetary sector. In its simplest incarnation the Monetary Approach postulates, among other things, that the law of one price holds permanently, and that the domestic rate of inflation will be equal to the world rate of inflation plus the rate of devaluation. At a more general level the MABP has important implications regarding the effectiveness of macroeconomic policy in an open economy. For example, under the most basic set of assumptions if there are fixed (or pre-announced) exchange rates the nominal quantity of money becomes an endogenous variable and monetary policy has no effect on inflation, or on the rest of the economy even in the short run. All the monetary authorities can hope to do is affect the composition of high powered money; changes in domestic credit result in instantaneous and opposite changes in the stock of international reserves, with total nominal money being unaffected.

The monetary approach has a long tradition emanating, at least, from Hume. Rigorously speaking the MABP only provides a very general framework to analyze balance of payments behavior. Its central proposition is that the balance of payments will reflect conditions of excess demand or supply for money in the domestic economy. This proposition, of course, is little more than a tautology derived from the balance sheet of the monetary system. In order for the MABP to be of analytical interest some structure has to be added through a macroeconomic model of the behavior of the economy. The textbook version of the MABP, which seems to have influenced (some) of the Chilean authorities, uses a caricature-type macromodel that assumes that there are

only tradable goods, PPP (or the law of one price) holds permanently, interest arbitrage holds continuously, and that both output and domestic credit are exogenous variables.¹¹

The use of a preannounced exchange rate as the fundamental form of combatting inflation was later also adopted in Argentina and Uruguay.¹² A crucial difference between Chile and these countries, however, was that in Chile, before the tablita was adopted, the fiscal deficit had been controlled. In this way the maintenance of the preannounced exchange rate policy was (somewhat) credible. The Chilean authorities, in fact, repeatedly pointed out that the tablita strategy was only possible because fiscal pressures had already been eliminated. In the Argentinian case, on the other hand, it was apparent early on that the fiscal and exchange rate policies were incompatible, and that it was only thanks to the massive capital inflows that the tablita could be maintained.¹³

In June of 1979, with inflation standing at an annual rate of 34%, the government put an end to the system of a preannounced declining rate of devaluation, and fixed the exchange rate at 39 pesos per dollar. Initially, it was stated that the fixed rate would last until February of 1980, when another preannounced schedule of devaluation was supposed to be designed. However, shortly before that time it was announced that the fixed rate would be maintained "forever".¹⁴

Besides the adoption of a fixed exchange rate regime, two other important developments took place during 1979. First, an important step towards the liberalization of capital flows was taken, when in June of that year commercial banks were allowed to greatly increase their ratio of foreign liabilities to equity. This relaxation in the controls to capital flows -- which was later complemented by further liberalizations in 1980 and 1982 -- resulted in

a dramatic increase in the level of foreign debt in the second half of 1979, and in the following two years. As discussed in detail in Chapter 3, most of these foreign funds were obtained by the private sector without government guarantee. The other important -- in fact crucial -- development of 1979 was the enactment of the Labor Law. This piece of legislation -- which is analyzed in greater detail in Chapter 6 -- institutionalized real wage rigidity by legally implementing a procedure by which wages were fully indexed to past inflation.

Contrary to what was expected by the architects of the tablita plan the domestic rate of inflation did not rapidly converge to its world counterpart (plus devaluation). In fact, the adoption of this plan helped generate a steady real appreciation, or real overvaluation, of the peso which, among other things, greatly hurt the degree of competitiveness of firms producing goods in the tradable sector, including nontraditional exports. Table 2-3 contains data for 1978-83 on the behavior of the rate of nominal devaluation with respect to the U.S. dollar, of two measures of U.S. inflation, and of the Chilean rate of inflation. As can be seen, from the beginning of the tablita phase the rate of domestic inflation exceeded the rate of the U.S. inflation, plus rate of devaluation. Using the change in the U.S. WPI as an indicator of international inflation, between 1978 and 1981 the accumulated divergence between Chile's and international inflation rates exceeded 120%.¹⁵

Although the adoption of the tablita, and the subsequent fixing of the exchange rate, was not the only determinant of the real overvaluation of the peso -- and, as pointed out in Chapter 3, probably not even the most important one -- in early 1980 many firms started to lobby for the abandonment of the fixed exchange rate policy. Of course, those firms whose final prices were more closely linked to the exchange rate lead the effort towards persuading

TABLE 2-3

Devaluation, Chilean Inflation and U.S. Inflation: 1978-1983

(percentage)

	(A) Annualized Rate of Devaluation With Respect to U.S. Dollar	(B) Annualized U.S. WPI Rate of Inflation	(C) Annualized U.S. CPI Rate of Inflation	(D) Annualized Rate of Inflation (CPI)
1978	21.4	9.6	9.1	37.2
1979	14.9	14.9	13.3	38.0
1980	0	12.3	12.4	31.2
1981	0	5.6	8.9	9.5
1982	88.3	1.5	3.9	20.7
1983		1.8	3.8	

Sources: All data refer to December to December rates of change.
Columns (A) and (D) are from Table 2-1.
Columns (B) and (C) are from International Financial Statistics.

the government to readopt a more flexible exchange rate policy. However, some of the large conglomerates or "grupos", which had heavily borrowed abroad and incurred high debts in foreign currency, staunchly opposed any changes in the exchange rate policy. As the degree of overvaluation became more serious the view of these two groups became increasingly antagonistic, as they tried to influence the behavior of the economic authorities.

The failure for the law of one price to hold -- and for domestic inflation to rapidly converge to the level of world inflation -- was initially considered as a major puzzle by the believers in the system, and a frantic search for possible explanations was launched.

Two explanations for the "divergent rates of inflation" puzzle became popular. The first one -- which was favored by the government authorities -- simply denied the fact that the law of one price failed to hold. It was argued that if appropriate indexes for Chile's "relevant external inflation" were used, the law of one price did in fact hold. For example, in his 1981 report, then-Minister of Finance Sergio de Castro -- a University of Chicago trained economist, and former professor at Santiago's Catholic University -- stated that if the international inflation was correctly measured, "the relevant external inflation...added to the domestic devaluation, exceeded domestic inflation" (Exposicion de la Hacienda Publica, 1981, p. 26). Of course, a problem with this explanation is that it was not clear how these "appropriate" indexes should be constructed. In fact, if instead of using U.S. data, one uses a weighted average of Chile's trade partners WPI's as an index of international inflation, and a weighted average of bilateral nominal exchange rates to construct an index of devaluation of the peso, the law of one price still failed to hold by a substantial margin. In this case between 1977 and 1981 the sum of accumulated rate of devaluation plus international

inflation amounts to 99%, well below the accumulated rate of domestic inflation of 171%.

The second explanation for the lack of rapid convergence of domestic and international inflation rates was more sophisticated. It was argued that although the law of one price tended to hold for tradable goods, the domestic and foreign inflation rates diverged because of an equilibrium increase in the relative price of Chilean nontradable goods.¹⁶ The proponents of this view correctly pointed out that this change in relative prices was the consequence of the increase in the level of aggregate expenditure, which, in turn, was possible thanks to the higher degree of foreign borrowing.¹⁷ Although this argument correctly identified the rapid growth of capital inflows as a source of relative price changes, it failed to recognize that this relative price change was only temporary, and was creating a serious long-run macroeconomic disequilibrium. As explained in detail in Chapter 3, the reason for this was that the increase in the rate of capital inflows did not represent a long-run macroeconomic sustainable situation, and eventually had to decline -- as indeed it did, in 1982. A second shortcoming of this sophisticated explanation was that it ignored the possible roles of other factors. The most important of these neglected factors was the backward wage indexation scheme.

Under conditions of decreasing inflation, a wage indexation mechanism that adjusts wages to past inflation will generally result in a secular increase in real wages, and will generate a real overvaluation. In this case, even if the law of one price holds for tradable goods, the convergence of domestic to international inflation can be quite slow. This fact can be illustrated using the following simple model of inflation in a two sector economy with a fixed (or preannounced) exchange rate, and a backward wage indexation mechanism:

$$\hat{P}_t = \alpha \hat{P}_{Tt} + (1-\alpha) \hat{P}_{Nt} \quad (2.1)$$

$$\hat{P}_{Tt} = \hat{E}_t + \hat{P}_{Tt}^* \quad (2.2)$$

$$D^N[(P_N/P_T)_t, Z_t] = S^N((W/P_N)_t) \quad (2.3)$$

$$\hat{W}_t = k \hat{P}_{t-1} \quad (2.4)$$

\hat{P}_t is the percentage rate of change of the domestic price level; \hat{P}_{Tt} is the percentage rate of change of the price of tradables expressed in domestic currency; \hat{P}_{Nt} is the rate of change of nontradable goods prices; \hat{E}_t is the rate of devaluation and \hat{P}_{Tt}^* is the rate of change of the international price of tradables; D^N and S^N are the demand and supply functions for nontradable goods; W is the nominal wage rate, and \hat{W}_t is its rate of change in period t ; and finally, Z_t is aggregate real expenditure. Equation (2.1) states that the rate of change of the overall price level is a weighted average of the rate of change of tradables and nontradables inflation, with α and $(1-\alpha)$ being the weights. Equation (2.2) is the law of one price for tradables. Equation (2.3) is the equilibrium condition for the market for nontradable goods. Demand depends negatively on relative prices and positively on aggregate real expenditure. Supply of nontradables, on the other hand, depends negatively on the product wage rate. Equation (2.4) is the rule of wage indexation, and states that in every period nominal wages are adjusted in a percentage k of past inflation. If, as was the case in Chile, there is full backward indexation, $k = 1$ and $\hat{W}_t = \hat{P}_{t-1}$.

From the nontradables market equilibrium condition we can obtain the following expression for the rate of change in the price of nontradables:

$$\hat{P}_{Nt} = \left(\frac{\eta}{\eta+\varepsilon}\right) \hat{P}_{Tt} + \left(\frac{\varepsilon}{\eta+\varepsilon}\right) \hat{W}_t - \left(\frac{\delta}{\eta+\varepsilon}\right) \hat{Z}_t \quad (2.5)$$

where η and δ are the price and real expenditure demand elasticities for

nontradables (i.e., $\eta < 0$, $\delta > 0$), and where ε is the supply elasticity of nontradables with respect to the product range ($\varepsilon < 0$). Combining (2.5) with the definition of inflation (2.1), the following is obtained:

$$\hat{P}_t = \left(\frac{\alpha\varepsilon + \eta}{\eta + \varepsilon}\right) \hat{P}_{Tt} + \left(\frac{(1-\alpha)\varepsilon}{\eta + \varepsilon}\right) \hat{W}_t - \left(\frac{(1-\alpha)\delta}{\eta + \varepsilon}\right) \hat{Z}_t \quad (2.6)$$

assuming, as was the case in Chile since mid-1979, that there is a fixed exchange rate ($\hat{E}_t = 0$) and that there is 100% backward indexation ($k = 1$), and further assuming in order to simplify the exposition that there are no demand pressures ($\hat{Z}_t = 0$), the following equation for the inflation rate is obtained:¹⁸

$$\hat{P}_t = \left(\frac{\alpha\varepsilon + \eta}{\eta + \varepsilon}\right) \hat{P}_{Tt}^* + \frac{(1-\alpha)\varepsilon}{\eta + \varepsilon} \hat{P}_{t-1} \quad (2.7)$$

This, of course, is a first order difference equation, whose solution indicates that (as long as there are no demand pressures) the domestic rate of inflation will slowly converge through time to the international rate of inflation \hat{P}_{Tt}^* . The speed at which both rates of inflation will actually converge will depend on the magnitude of the coefficient $(1-\alpha)\varepsilon/(\eta + \varepsilon)$. Notice, however, that if there are positive demand pressures for nontradables -- stemming for example from an increase in borrowing from abroad -- $\hat{Z}_t > 0$ and the convergence of both rates of inflation will be much slower, and can even fail to take place for a long period of time.

The slow convergence of the domestic to international rate of inflation in the presence of lagged wage indexation illustrated in equation (2.7) has two important consequences. First, under declining inflation real wages will generally increase through time, and second, there will be a real appreciation of the domestic currency. Combining equations (2.4) and (2.7) we find that

the change in the real wage can be written as:

$$\hat{w}_t - \hat{p}_t = (\hat{p}_{t-1} - \hat{p}_{Tt}^*) \left(\frac{\alpha\varepsilon + \eta}{\eta + \varepsilon} \right). \quad (2.8)$$

As can be seen from this expression, as long as lagged inflation exceeds international inflation (i.e., $\hat{p}_{t-1} > \hat{p}_{Tt}^*$), as will usually be the case in a declining inflation environment, real wages will increase through time. Since this increase in real wages is completely unrelated to increases in productivity, it would put considerable strain on the degree of profitability of the tradable goods sector.

Defining the real exchange rate (e) in the standard way:

$$e_t^* = \frac{E_t P_t^*}{P_t}, \quad (2.9)$$

we find that its rate of change is equal (maintaining the assumption of fixed nominal rate) to:

$$\hat{e}_t = \frac{\varepsilon(1-\alpha)}{\eta + \varepsilon} (\hat{p}_{Tt}^* - \hat{p}_{t-1}). \quad (2.10)$$

This expression indicates that under a fixed rate regime with backward indexation, as long as the international rate of inflation is below the lagged domestic rate of inflation, there will be a real exchange rate appreciation.

As suggested by this model, after the adoption of the fixed rate, and the legalization of the wage indexation scheme in 1979, both a steep increase in Chile's real wage and a substantial real appreciation of the peso were observed. Whereas between 1979 and 1981 the real wage rate increased by --%, during the same period the real exchange rate experienced a real appreciation (i.e., real overvaluation) of --%.

In February 1980, when the dollar began appreciating against the major international currencies, so did the peso. This was the result of the peso being pegged to the dollar, rather than to a basket of currencies like the SDR. In a sense, instead of having a fixed exchange rate, during the next two and a half years Chile had an exchange rate which appreciated, in nominal terms, relative to a basket of world currencies. This can be seen in Table 2-4, which contains indexes for Chile's nominal exchange rate with respect to the U.S. dollar, and with respect to a basket of 18 currencies of Chile's most important trade partners. As may be seen, while between the third quarter of 1979 and the second quarter of 1982 the nominal exchange rate with respect to the dollar remained constant, the more comprehensive index of the nominal rate relative to the basket of currencies experienced a nominal appreciation that exceeded 31%.

After the peso was fixed to the U.S. dollar in 1979, monetary policy became increasingly passive. Within the strict context of the simple monetary approach to the balance of payments, the authorities argued that in a small open economy with fixed exchange rates monetary policy was completely ineffective in the short-run.¹⁹ The Minister of Finance, Sergio de Castro, stated in 1981 that since the fiscal deficit was under control, and the country had a fixed exchange rate system, there was no need for the Central Bank to engage in any kind of active monetary policy; the plan was that from that time onward, the Central Bank would follow a "neutral policy" where its stock of domestic credit would remain unchanged in nominal terms. According to this program, increases in the demand for money would have to be fully satisfied through the accumulation of international reserves which, in turn, would be a reflection of higher international loans.²⁰ During the second part of 1980 and most of 1981 the Central Bank tried to follow this neutral policy,

TABLE 2-4

Index of Nominal Exchange Rates: 1978-1983

(1979.3 = 100)

	<u>Index of Nominal Exchange Rate With Respect to U.S. Dollar</u>	<u>Index of Nominal Exchange Rate Relative to Basket of Currencies</u>
1978.1	74.6	88.4
1978.2	80.1	91.2
1978.3	83.8	94.9
1978.4	86.1	95.6
1979.1	89.0	95.0
1979.2	92.9	94.5
1979.3*	100.0	100.0
1979.4	100.0	95.9
1980.1	100.0	92.3
1980.2	100.0	90.8
1980.3	100.0	90.7
1980.4	100.0	88.1
1981.1	100.0	83.9
1981.2	100.0	76.4
1981.3	100.0	71.8
1981.4	100.0	72.1
1982.1	100.0	68.9
1982.2	100.0	68.7
1982.3**	141.1	88.9
1982.4	177.6	109.9
1983.1	192.2	119.2
1983.2	193.2	116.2
1983.3	204.5	119.0
1983.4	218.7	126.2

Table 2-4 (cont.)

Sources: Constructed by the authors using raw data from the International Financial Statistics. The following countries were used for constructing the basket index (weights are in parentheses: US (.23), Germany (.14), Japan (.10), Argentina (.10), UK (.07), Italy (.03), Netherlands (.05), Spain (.03), Brazil (.07), France (.03), Colombia (.01), Mexico (.01), Ecuador (.03), Peru (.02), Sweden (.01), Belgium (.02), Venezuela (.02) and Saudi Arabia (.03).

* In this quarter the exchange rate was fixed at 39 pesos per dollar.

** In this quarter the fixed exchange rate of 39 pesos per U.S. dollars was abandoned.

with almost the totality of the increase in monetary aggregates during this period being the result of the evergrowing foreign debt.

In 1981, after almost two years of having a fixed exchange rate -- and partially thanks to the steep appreciation of the dollar in the international financial market -- the domestic rate of inflation began to converge to the level of international inflation. In that year the rate of change of the CPI was 9%, while there was a decline of --% in the WPI.²¹ At this time, however, the degree of real overvaluation of the peso had reached considerable proportions, and it became increasingly apparent that the situation was not sustainable. Generalized expectations of devaluation began to settle in, and a massive speculation against the peso erupted. In part as a result of these heightened expectations of devaluation interest rates skyrocketed, and numerous firms faced the prospect of bankruptcy. Surprisingly, even on the face of a major macroeconomic disequilibrium, the government decided to stick to the "neutral policy", refusing to take an active stance on monetary and exchange rate policies. It was repeatedly argued that without any intervention by the monetary authorities the economy would adjust automatically. Based on the most basic textbook interpretation of the law of one price, the economic authorities repeatedly argued that the only effects of nominal devaluations was to generate an equivalent domestic inflation, without affecting relative prices of the real exchange rate.²²

The role the authorities assigned to the "automatic adjustment" macroeconomic mechanism is clearly captured by the following quote from the chief policymaker, Minister of Finance Sergio de Castro (Exposicion de la Hacienda Publica, 1981, p. 27).²³

[T]he neutral monetary policy of the Central Bank implies that money is only created as a result of inflows of foreign exchange. If such inflows do not take place via a higher level of foreign loans, the private sector's desire to finance a high current

account deficit will be simultaneously reflected in a loss of international reserves, and in an equivalent monetary contraction. This will raise the interest rate, generating a decline in expenditure and in the demand for imports, to the level required to finance a current account deficit compatible with the level of foreign borrowing that the country can sustain.

From here de Castro went on to say that devaluations were completely ineffective since they would generate equiproportional inflation, and would have no effect on the real exchange rate. He then arrogantly stated that "the fixed exchange rate can be maintained, and will be maintained for many years" (Exposicion de la Hacienda Publica, 1981, p. 27).

This quasi-nihilist position regarding monetary and exchange rate policy, of course, ignored the fact that in most historical episodes where the initial real exchange rate was highly overvalued, nominal devaluations, if accompanied by appropriate macroeconomic policies have been highly effective in generating relative price adjustments or real devaluations.²⁴ In the case of Chile in 1981 the problem was not that the devaluation would have been ineffective per se; but that the 100 percent wage indexation scheme would have greatly reduced the effectiveness of a nominal exchange rate adjustment. It is well known that in this case a devaluation will be fully translated into higher wages. In 1981, then, a solution of the problem required both an abandonment of the ill-fated wage indexation law and an exchange rate adjustment. None of this was done by the government and, although things got dramatically serious, it was insisted that without any need for intervention the process of "automatic adjustment" would restore macroeconomic equilibrium.

In a way the "automatic adjustment" mechanism almost worked. In late 1981, expecting the devaluation, the public started to actively speculate against the peso, massively purchasing foreign exchange. This plus the somewhat reduced level of foreign credits resulted, as de Castro had pointed out, in a decline in the nominal level of base money in the second and third

quarters of 1981 (see Table 2-5). This squeeze in liquidity and the generalized expectations of devaluation helped generate a steady increase in interest rates, and a substantial decline in expenditure. The magnitude of this automatic adjustment was clearly insufficient, and the real overvaluation was not corrected. Also this adjustment mechanism was taking a high toll in terms of economic activity and employment. For example, during the first three months of 1982 industrial production experienced declines, with respect to the same months in the previous year, of 16%, 13% and 12%. Also, in March 1982 the rate of open unemployment had climbed to 18.4%, from 11% in March of 1981.

This unsustainable situation finally burst in 1982 after an abrupt drop in capital inflows. At that time the economy desperately needed a real devaluation and a macroeconomic readjustment. In June of 1982 the government finally decided to abandon the "automatic adjustment" approach, and to pursue a more active policy. The peso was devalued by 18%, and the indexation clause of the labor law was amended. However, this was too little, and too late. At this point the loss of credibility in the government policies was almost complete, and the devaluation even accelerated the speculation against the peso, with the resulting large loss of international reserves in the following weeks. Also the international financial community reacted negatively to these measures, and the flow of foreign funds towards Chile was further reduced. The June devaluation was followed by a brief experiment with flexible rates, and by a dual rates system. In early 1983 a new Minister of Finance -- the third since de Castro had resigned almost a year before -- declared the inconvertibility of the peso, imposed severe exchange controls and implemented a (temporary) hike in import tariffs to a uniform 20% level. In twelve months -- between June of 1982 and June 1983 -- the Chilean peso was devalued by 99% and inflation reached 32.7%. In this way the fixed exchange rate system,

TABLE 2-5

Rate of Change of Different Nominal Monetary Aggregates1977-1982

	(A) Rate of Change of Base Money (%)	(B) Rate of Change of M1 (%)	(C) Rate of Change of M2 (%)	(D) Rate of Change of M3 (%)	(E) Rate of Inflation (%)
1977 Q1	33.1	45.1	58.3	58.4	
Q2	23.2	22.9	28.7	30.1	
Q3	7.7	14.4	16.6	18.6	
Q4	13.0	11.8	13.7	13.8	
1978 Q1	18.5	30.2	12.2	32.5	
Q2	14.1	17.1	18.3	18.5	
Q3	3.5	6.6	15.9	17.0	
Q4	14.0	9.6	21.1	21.3	
1979 Q1	12.7	21.9	24.3	26.2	
Q2	10.1	9.9	9.0	10.6	
Q3	4.8	7.2	13.3	14.8	
Q4	12.3	11.3	11.2	11.8	
1980 Q1	7.2	16.6	13.9	15.0	
Q2	7.3	13.9	9.8	10.8	
Q3	6.0	7.2	12.5	15.3	
Q4	11.7	13.7	14.0	15.1	
1981 Q1	9.0	10.5	14.0	17.0	
Q2	-11.2	1.4	17.7	17.4	
Q3	-3.7	-3.5	11.7	11.9	
Q4	7.0	7.3	6.3	1.7	
1982 Q1					
Q2					
Q3					
Q4					

Source: Banco Central de Chile.

which according to some government officials should have lasted for decades -- and which others even wanted to establish in the constitution -- came to an embarrassing end. Inflation, on the other hand, was back to its long-term historical average.

2.3 The Costs of Disinflation

The stabilization program almost succeeded. It reduced inflation from more than 600% to a one digit level in little more than 7 years. However, this goal was achieved at substantial costs, and, what is even worse, the curbing of inflation was short-lived; between 1982 and 1984 inflation has wandered around --%, not far from the historical average.

It is possible to argue that until late 1979, and in spite of the recession generated by a "shock" anti-inflationary plan of April 1975, the stabilization program had been quite successful. Inflationary expectations had been broken, the fiscal deficit was under control, and the rate of inflation had been reduced to its historical average of around 30% per year.²⁵ Until June of 1979 the tablita had only generated a small real appreciation, which given the large devaluation of the early years had not yet impacted the economy's ability to compete internationally (see Chapter 3). In the fateful year of 1979, however, a series of ill-conceived and mutually inconsistent policy measures were taken, including the pegging of the peso to the U.S. dollar, the legalization of the backward indexation scheme, and the relaxation of controls for capital movements. All these policies conspired to generate a severe disequilibrium situation in the external sector, which, as has been pointed out, was reflected by massive real overvaluation of the peso. The maintenance of this overvalued exchange rate for a long time, and more seriously the insistence on relying on an automatic adjustment scheme to solve the macroeconomic disequilibrium, deepened significantly what otherwise should

have been a serious but not devastating crisis generated from adverse foreign shocks.

Although there is little doubt that the manipulation of the exchange rate, and ultimate pegging of the peso to the dollar when inflation was still running at a 30% annual rate was an ill-made policy decision, it is also true that pointing exclusively at the exchange rate policy -- as many popular accounts of the Chilean experiments had -- as the only cause of the failure of the liberalization reform is a gross oversimplification. The complexities of the Chilean case go well beyond a particular policy. Even though there is little doubt that the exchange rate played an important role in the events of 1973-1983, it was, as emphasized in Chapter 8, only one of the elements that determined the final outcome of the Chilean experiment. It possibly was not even the most important one.

Footnotes to Chapter 2

¹Official consumer price indexes have a number of shortcomings, especially for 1971-1978. For this reason in this study we use the indexes as corrected by Yanez (----) and Cortazar and Marshall (1982). At times we also use the GDP deflator, which is free of measurement problems.

²Since during the UP there were 15 different exchange rates, it is difficult to measure the extent of the devaluation. However, the official imports rate was devalued by more than 1000%. Initially the military government reduced the number of exchange rates to three. Late, in ----, all rates were unified into a single exchange rate.

³The lack of results in the stabilization program became somewhat of a political embarrassment, since in late 1973 a senior government official had stated that in one year the rate of inflation would reach zero!

⁴On the fiscal reform see Minister Cauas' speech as reproduced in Mendez (1979, p. 119) and the analysis in Guzman (1975). Although the fiscal reform greatly improved the efficiency of Chile's taxation system, there still remained some highly distortive taxes. In particular taxes on labor -- including social security taxes -- remained quite high until the social security reform of 1980.

⁵See also Harberger (1981b). Other experts -- for example Alejandro Foxley -- also agree that there wasn't a monetary crunch in Chile. See Cline and Weintraub (1981, p. 233). The main reason why in 1975 we observed a reduction in the fiscal deficit, while credit creation by the Central Bank continued (see Table 2-2), rests on the fact that government enterprises -- which are not part of the Fiscal sector -- still ran huge deficits. See Harberger (1982) and Foxley (1981, discussion).

⁶See Bardon, Carrasco and Vial (1985) for a long discussion on the pre-coup monetarist diagnosis. As Bardon et al. point out this pre-coup document became, in a way, the original draft for the Pinochet economic program.

⁷Chile had successfully used this type of crawling peg exchange rate system during the 1960s. See Ffrench-Davis (1981).

⁸The maintenance of a high real exchange rate was thought, from the beginning, as being an important element in the trade liberalization strategy (see Bardon et al. 1985). This objective was later frustrated as a result of the preannounced and fixed exchange rate policy, and of the opening of the capital account. See below and Chapters 3 and -- for further discussions.

⁹Expectations have played an important role in the analysis of hyperinflation processes. See, for example, Sargent (1983) and Dornbusch and Fischer (1986). Under rational expectations what matters is the public's expected path of future behavior of the determinants of inflation. In the Chilean case the public used the rate of devaluation as a signal on the expected rate of money creation.

¹⁰Historically, of course, this was not the first time that the manipulation of the exchange rate was used as a tool in an attempt to bring down a substantial inflation. For example, the failed stabilization attempt of February-April 1923 during the German hyperinflation relied on fixing the exchange rate (Dornbusch and Fischer, 1986). What was new in the Chilean case, however, was that rather than fixing the value of the peso, a declining rate of devaluation was announced.

¹¹For a discussion on the analytical aspects of the MABP see the essays collected in Frenkel and Johnson (1976). For an analysis on the role of the MABP in the Latin American stabilization programs of the 1970s see Ardito-Barleta et al. (1982).

¹²On the Argentinian case see Fernandez (1985) and Calvo (1986). On Uruguay see de Melo and Hanson (1985). For a comparison of Argentina, Chile and Uruguay see Corbo and de Melo (1986).

¹³See Cumby and van Wijnbergen (1983) for an analysis of how the persistence of the fiscal deficit in Argentina greatly affected the outcome of the devaluation crisis of 1981. See also Conolly (1986).

¹⁴In June of 1979 the previously preannounced path of the exchange rate still had six more months to go. In order to (partially) hold to its commitments, just before fixing the exchange rate, the government implemented a devaluation which brought the price of the dollar to the level it would have had in December of that year, if the tablita had not been abandoned.

¹⁵The use of U.S. price indexes to proxy international inflation is not completely correct. However, as pointed out below, even if weighted average rates of inflation for Chile's trade partners are used, a large divergence between the domestic and international rates of inflation is observed.

¹⁶See, for example, de la Cuadra (1980). According to this view domestic inflation (\hat{P}_t) is a weighted average of the rate of growth of nontradable and tradable prices: $\hat{P}_t = \beta \hat{P}_{Nt} + (1-\beta) \hat{P}_{Tt}$. If, on the other hand, the law of one price holds for tradables, $\hat{P}_{Tt} = \hat{E}_t + \hat{P}_{Tt}^*$, where \hat{E}_t is the rate of devaluation and \hat{P}_{Tt}^* is international inflation for tradables. Domestic inflation can be rewritten as $\hat{P}_t = (\hat{P}_{Tt}^* + \hat{E}_t) + \beta(\hat{P}_{Nt} - \hat{P}_{Tt})$. If there are no relative price changes, (i.e., $\hat{P}_{Nt} = \hat{P}_{Tt}$), the domestic rate of inflation will be equal to international ~~devaluation~~ ^{inflation} plus devaluation ($\hat{P}_t = \hat{P}_{Tt}^* + \hat{E}_t$). If, however, there is an increase in the relative price of nontradables ($\hat{P}_{Nt} - \hat{P}_{Tt} > 0$), then $\hat{P}_t > (\hat{P}_{Tt}^* + \hat{E}_t)$.

¹⁷Surprisingly, however, after recognizing the Dutch-Disease nature of capital inflow liberalization, then-Central Bank President Sergio de la Cuadra

(1980), argued that the nominal exchange rate should be revalued.

¹⁸In Chapter 3, however, the assumption that $\hat{Z}_t = 0$ is lifted when the role of capital inflows is discussed in detail.

¹⁹See, for example, Bardon and Bacigalupo (----), de la Quadra (----). Corbo (1982), however, used a sterilization empirical model to analyze this issue, and concluded that during all of this period the Central Bank was able to sterilize.

²⁰See, for example, the 1981 Exposicion de la Hacienda Publica.

²¹An important consequence of this drastic drop in inflation in 1981 was that real wages experienced an important jump. This was the result of nominal wages being adjusted by lagged inflation.

²²See de la Quadra (1981), de Castro (1981). This view was influenced by the results of an econometric study by Corbo (1982), where it was argued that nominal devaluations would have no effect on the real exchange rate in Chile. However, for opposite results using a similar model and additional data points, see Corbo (1985).

²³Free translation by the authors.

²⁴For a discussion on numerous devaluation episodes see Edwards (1986).

²⁵See, however, Edwards (1985a,b) for a more detailed discussion on the costs of the 1975 plan.