EXCHANGE RATE POLICIES: THE EXPERIENCE WITH THE CRAWLING PEG[*]

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Chile was a pioneer in implementing exchange rate (ER) policies that belong to the family of crawling peg approaches. This happened between April 1965 and July 1970, making Chile the first country to implement a policy of this nature systematically.[1] Subsequently, from October 1973 to June 1979 a second, diverse, experience of this kind of exchange rate system was carried out. Finally, in the 1980s, after the 1982 crisis, a crawling peg was reinstated that evolved into a crawling band and survived until September 1999. Here we concentrate on the first two experiences; the latter is covered in Ffrench-Davis (2010).

The two policies involved frequent upward adjustments of the exchange rate, lasted more than five years, and were established during periods of acute balance of payments difficulties and sizable inflation rates. However, they differ with respect to the political environment in which they were implemented and with respect to the role assigned to the exchange rate, the stability of the policy, the size of the individual nominal adjustments, and the criteria used to determine modifications of the real rate.

Section 1 begins with a brief discussion of some specific aspects that are relevant for an evaluation of exchange rate policies in the two particular experiences covered by this chapter. In section 2 a description of the main features of the specific policies applied is given, along with an examination of the similarities and differences among and within each period. In section 3, a short discussion of the more important conclusions and pending questions is attempted.

1. Some introductory aspects

We have emphasized that it is hard to evaluate any public policy experience objectively. Policies have effects in very diverse domains and indirect and long-run consequences that usually are difficult to trace.

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[1] After Chile, Colombia and Brazil implemented a crawling-peg system in 1967 and 1968, respectively. These and other country experiences are analyzed in Williamson (1981).

Both the domestic and external environments have an important influence on the selection, effects, and interpretation of the results of exchange rate policy. In table IV.1, macrodata related to the Chilean economy are provided.

(Table IV.1)

The initial domestic economic situation of both experiences was characterized by balance of payments difficulties, low reserves, substantial debt service, widespread nontariff restrictions, and high and variable inflation. All of these disequilibria were much larger at the outset of the second experience than in the first one. The public sector was an important operator in the foreign sector, a role that was enhanced after the nationalization of the main copper-mining enterprises in 1971, with copper generating over 60% of export proceeds.

Finally, the domestic capital market witnessed a deep transformation during those years. In the first period, it was more regulated and there was some noninterest credit rationing, although the banks' real lending interest rate was positive, close to a policy target of 6 to 10% per year (see table IV.3, col. 4). In the second period, the domestic capital market was largely liberalized, the controls on interest rates having been completely removed; the real interest rate fluctuated widely, averaging 38% per year in 1975-82. A large segment of the domestic financial market operated on a thirty-day basis (see chap. V).

The external framework exhibited a highly unstable copper price, with an average high price during the first episode. With respect to the second one, the raw materials price boom of 1973-74 was very favorable to Chile because of the weight held by copper in exports. However, in 1975-78 the terms of trade worsened when copper prices became depressed -about one-fourth below "normal" levels- until mid-1979, when they moved closer to their trend line. Furthermore, Chile is a net importer of oil, which increased from 6% of imports in 1973 to 13% in 1980. Finally, Chile made use of the increased availability of funds in international capital markets. In both experiences, it received a capital flow larger than that needed to finance the deficit on the current account (table IV.1, lines 8 and 9), leading to an accumulation of reserves (and to an expansion of base money) larger than that presumably desired by the authorities.[2]

The definition of the *crawling peg* adopted here is that used by Williamson (1981). It is a policy with a nominal rate fixed by the government with or without a formal band; the peg is adjusted in small steps in order to follow some sort of "equilibrium" path. *Small* can be defined in

[2] The lack of a deeper financial market did not allow massive monetary sterilization.

relation to the influence on relative prices and opportunities for speculative gains. The latter can be based on objective criteria, corresponding to the costs involved in exchanging domestic for foreign currencies (and of investing and divesting in alternative income-earning assets). It is obvious that the larger the net rate of domestic inflation the more frequent each ER adjustment must be in order for them to remain "small", that is, of a size estimated to avoid speculative activity and capital gains at the expense of the Central Bank.

Both the policy package within which the exchange rate is placed and the associated specific objectives attached by policymakers are of crucial importance. In both experiences, the explicit desire was to have a "realistic" policy that sought to impose an "equilibrium" rate and bring greater stability to price relations. However, the interpretation of *equilibrium* was not uniform. In the first experience, it was related to some (not completely specified) level of the balance on the current account, which was estimated with a trend or normal price of the main export and with a certain level of indebtedness, lower than in the previous regime. In the second period, the authorities appeared to be trying to return the ER to the purchasing power parity of 1970, but subsequently they were strongly influenced by the change in gross reserves, and the ER became more of a monetary policy tool than a stable resource allocator. Finally, the ER was used as the main instrument regulating inflationary expectations and as anchor for tradable prices, rather than as the tool equilibrating the balance of payments or seeking a given current account target. The changing role of the ER -the changes in policy priorities and (subjective or objective) restrictions on the availability of policy tools- meant large variations in the real exchange rate (RER).[3]

Once the indexes suitable for measuring the RER are available, there remains the more difficult challenge of determining the optimal trend and the optimal degree of stability of the RER.

2. The evolution of exchange rate policies

Exchange rate policies applied in Chile after the 1929 world crisis and until the mid-1960s share much with the policies enforced throughout South America during that period. For long

[3] By RER, I mean the nominal exchange rate divided by an index of domestic prices and multiplied by one of the external prices (see table IV.3). With respect to external inflation, it is common to use the wholesale price index of the United States. But, since the geography of Chilean trade was diversifying and price relations and exchange rates among the country's main trading partners had changed notoriously, it was much more relevant to utilize a weighted index that reflects these phenomena (see Ffrench-Davis, 1973, App. I; and Ffrench-Davis, 1984).

periods, Chile had a fixed nominal ER; since the domestic economy was characterized by a rate of inflation persistently higher than that prevailing abroad, real rates declined through time and generated recurrent balance of payments crises. The response of authorities was to make use of various restrictive practices without ER adjustments, although sooner or later the use of ER policies would become inevitable. Sometimes such measures involved the devaluation of a unified rate. On other occasions, multiple rates were created, with higher rates for "nonpriority" groups of commodities and continuous changes in the coverage of each group. At some points in time, apart from widely diverse tariff rates and quantitative restrictions, several hundreds of multiple rates coexisted, with ranges as large as one to fifteen between the lower and the higher rates.[4] From time to time, flexible or free rates were established, covering all of the market or some segments of it, which actually either fluctuated freely (and vigorously) or were subject to intervention by the Central Bank. In a few cases, the government performed a series of small devaluations, though for short periods and without a clearly defined policy.

The predominant policy feature was the intent to maintain a nominal peg, but in fact it became an adjustable peg in response to balance of payments crises, with large jumps in the nominal rate and instability in the real rate.

a) A "programmed" exchange rate policy: 1965-70

In late 1961, Chile suffered a sizable balance of payments crisis after three years of a pegged nominal rate and an extensive liberalization of trade and capital flows. The fixed rate had been given a crucial role as an anti-inflationary expectations builder, and in fact it worked as such during the period when it remained pegged, between 1959 and 1962. However, when it was drastically modified, after being frozen for four years, expectations changed its sign and ER depreciated strongly (72%, between October 1962 and January 1963). The devaluation was forced by three factors: exports had increased much less than expected, and imports much more than expected; and capital inflows –which had closed both the current account and the fiscal gaps– declined since 1961. The ER had been helping to repress domestic price increases, and devaluation opened the way to a large upsurge of inflation (from 9% in 1961 to more than 40% per year in 1963 and 1964).

[4] The policies applied in 1952-70 are analyzed in Ffrench-Davis (1973, chap. IV).

Two other features of the initial situation influenced policy choices in 1965. On one hand, large speculative capital movements had taken place, together with huge capital gains for economic agents who had "anticipated" the 1962 crisis. On the other hand, in 1961 a dual ER market had been created, with a "broker's" market for foreign exchange related to tourism, several services, and capital movements; both access to the market and the price in the broker's market were free. The rate suffered large ups and downs until it came under the control of the Central Bank, remaining pegged up to the end of 1964. My conclusion was that both the nominal peg and free rates –the two corner solutions that were then the options in fashion in the literature– had a negative impact on both macroeconomic stability and resource allocation (Ffrench-Davis, 1964).

In November 1964, a new six-year presidential term began. The economic authorities had designed a gradual program to reduce the 50% annual rate of inflation, recorded by October, which it was assumed would persist at decreasing but still significant rates for several years. Furthermore, the new government wanted to pursue in a more rational fashion the substitution of imports, to expand and diversify exports, and to avoid speculative movements and balance of payments shocks to the domestic economy, including those on inflationary expectations, which had been so recurrent in the previous decade (Ffrench-Davis, 1964; and Ffrench-Davis, 1973, p. 98; Molina, 1972, p. 110). Nonetheless, there was no consensus with respect to which trade policies ought to be implemented to achieve those objectives. It took several months of internal discussion before the authorities agreed on the new exchange rate policy, which was implemented in April 1965.

A crawling peg was adopted. The official rate was to be announced periodically by the Central Bank, with "small" upward adjustments. The purpose was to have a reasonably stable real exchange rate without large jumps in order to provide better allocative signals and avoid speculative capital gains and shocks to the domestic economy.[5] The trend of the RER was to depend on "the medium- and long-run prospects of the Chilean foreign sector".

The new policy design retained three exchange rates: a main rate for the bulk of trade (called the forward bank rate); one for the large copper-mining enterprises, which were then foreign owned (the spot bank rate); and one for tourism, financial capital flows, and various services (the broker's rate).

[5] It was thought that the ER influenced prices in proportion to its direct incidence on the costs of production and that larger inflationary effects were tied only to abrupt large devaluations through their impact on expectations. It should be noted that exportables had a low share of domestic expenditure and thus a small incidence on overall domestic prices.

The so-called forward bank rate worked in such a way that in each foreign exchange operation the flow of domestic funds (payments by importers and payments to exporters) took place about two months before the flow of the foreign currency at the ER prevailing during the occurrence of the former; this, apart from eliminating the exchange risk during that period, implied that an interest-free-loan was granted by importers to exporters. The value of the "forward" component amounted to roughly 2%, plus the "credit availability" effect in somewhat restricted and segmented financial markets such as those prevailing in Chile (Ffrench-Davis, 1973, chap. V).

The spot bank rate had traditionally been lower than the forward rate in order to tax indirectly the economic rent accruing to foreign copper producers. The spot rate was increased gradually, thus reducing the gap between the two rates. This step was part of an agreement, between the Chilean government and the foreign firms Anaconda and Kennecott, to increase investment in the production of copper, with taxation based on net income (rather than on the exchange rate), but it was also intended to foster a rise in the ratio of domestic to imported inputs in copper output.[6]

The broker's rate was kept permanently above the forward bank rate in an effort to make the total implicit price for the average demander of foreign currency roughly the same whether it was used to import goods or to undertake tourism abroad. The target gap between the two rates was 20%, a figure intended to reflect the estimated average net tax on imports.[7]

The nominal rates were devalued once or twice a month; the average rise was 1.5%, covering a range from 2.9 to 0.4% (see table IV.2). The real forward bank rate was increased by 35% during the sixty-three months that the policy lasted (table IV.3, col. 1).

(Table IV.2)

The main variable guiding the nominal ER adjustments was the expected rate of domestic inflation. It was the purpose of the authorities to achieve a real devaluation: first, because there was a desire to reduce the upward trend of the previous decade in foreign indebtedness; and, second, because the average level of protection for import substitutes was to be reduced gradually, thus requiring a compensatory adjustment in the ER.[8]

[6] The response of the domestic/foreign inputs ratio to relative prices and to direct regulations is examined in Ffrench-Davis and Tironi (1974, pp. 227-32). It is found a significant effect of the exchange rate and other public policies on the level of integration of the copper industry with the domestic economy.

[7] This estimate, based on actual customs tax proceeds, as is well known, tends to underestimate the average nominal protection on import substitutes. The gap was increased in moments of foreign currency shortage in order to deter tourism abroad and to foster capital inflows.

[8] Most prohibitions and import deposits were eliminated, and a rationalization of tariffs, implying a moderate liberalization and reduction of the variance of effective protection, was begun (Ffrench-Davis, 1973, pp. 96-116).

Three factors strongly influenced the real trend shown by the ER in 1965-70: the rate of external inflation, a balance of payments problem in 1967, and the behavior of the price of copper and capital flows.

The existence of external inflation –for that period about 2.4% per year on average– contributed to a real devaluation. A conjuncture that allowed an additional real depreciation was a balance of payments deficit in 1967. As part of its economic policy, the government had improved and extended a system of periodic projections of reserve movements, import intentions, and the current account. These projections showed an imbalance that needed timely action. The set of trade measures adopted by mid 1967 (Ffrench-Davis, 1973, p. 104) included a reduction in fiscal expenditure and a faster devaluation (with more frequent adjustments); as a consequence, between July 1967 and February 1968 the RER was devalued by 12% (with a larger broker's rate devaluation). The real devaluation contributed to solving the balance of payments imbalance while avoiding a serious shock to the domestic economy; apparently, the crawling peg approach had removed the ER from its former role as the main expectations builder.

During the remainder of the period, because of a higher price for the main export of Chile (copper, which represented about two-thirds of total exports) and an increase in the share of its economic rent accruing to the government, the balance of payments showed sizable surpluses from 1968 onward. This also induced an increase in short-term capital inflows into a "successful" emerging economy. The inflows were fostered by the larger reserves, an expanded debt-servicing capacity, and relatively tight domestic credit. Obviously, strong pressures were exerted within and on the government in order to freeze the ER. In this environment, it became more difficult to continue increasing the RER, but the economic authorities managed to retain the improvement achieved in 1967-68 and to enlarge it by continuing to crawl nearly *pari passu* with the rate of inflation; thus external inflation provided a positive differential.[9]

Given the balance of payments surplus and the nature of the pressures against the policy being enforced, it is probable that actual expectations were predicting a declining RER; those expectations, in combination with the natural gap between the external and domestic interest rates, were some of the incentives that encouraged the huge inflows of capital in 1968-70.

[9] It must be stressed that in the 1960s there was very limited understanding of the implications of external inflation for the RER.

Probably the main obstacles faced by ER policy in the period 1965-70 related to coordination with other economic policies. On the one hand, the ER policy intended to limit the transmission of copper price instability to the domestic economy: thus, "normal" balance of payments estimates assumed a copper price lower than the actual high price. Apart from guiding policy according to the "normal" price, it was necessary to ensure that the recipients of copper export proceeds also had their incomes stabilized. This was largely done by the government with respect to the large copper producers. In the case of fiscal proceeds it was done (through annual agreements between the Central Bank and the Treasury on the use of the tax revenue from large copper producers) by using an account in dollars in the Central Bank where the "excess" of revenues were deposited. This was the "informal" birth of the Copper Buffer Fund.

On the other hand, capital flows tended to be destabilizing. The government had at its disposal only weak tools with which to check or compensate for them. It was able to establish a minimum repatriation period for new inflows and to reduce domestic credit to partially compensate for the increased high-powered money originating from the accumulation of reserves. In a rather segmented capital market, the drastic change in the composition of money creation produced some financial bottlenecks. This phenomenon was repeated more intensively and had a more severe impact during the second experience.

In summary, given available policy tools, in 1965-70 it was desired to have more stability in the RER than in reserves, (i) because of its direct allocative effect, particularly with regard to exports; (ii) because of the fear of ratchet price effects if the ER started following transitory changes in the terms of trade or capital flows; and (iii) because of the belief that the actual price of copper was above its "normal" level and would fall drastically some time in the future, as it did by mid-1970.

b) The Crawling Peg in 1973-79

In October 1973, a crawling peg was again adopted. In this period, three different phases can be distinguished. The first phase ends in June 1976, the second extends to February 1978, and the third continues until June 1979 when the crawling peg was replaced with a nominal peg.

i) The first phase, with binding external constraints

During most of 1973, there was a critical balance of payments situation and inflation was at an annual rate of close to 400%.[10] The government had established a system of multiple exchange rates in December 1971, and by August 1973 this involved six rates, with the lower one being only 3% of the highest. Although the government adhered to the nominal peg, it had been forced by the economic situation to make large devaluations; furthermore, by March 1973 it had reintroduced the crawling peg in the main area of the broker's market. However, most of the ERs lagged notoriously behind the climbing rate of inflation.

Some weeks after the coup of September 1973, the government announced a new economic policy directed toward reducing public intervention in the economy. Despite the fact that most price controls were abruptly lifted, the exchange rate continued to be controlled. The multiple rates were reduced to three, as had been the case until the end of 1971. The main rate, that of the forward bank market, was devalued by approximately 300%. The intention was to obtain a real rate approximately equal to that of 1970 (apparently, the role of the external inflation was ignored). Even though the main broker's rate was *revalued* 53%, it still remained above the forward bank rate, while that for copper returns was kept at a low level (40% of the forward bank rate). The crawling peg was adopted for all three rates, with converging movements.[11] By August 1975, the government achieved the target of a fully unified official exchange rate, divergent only from the black market rate.[12]

The rates were adjusted between one and four times a month, with a frequency similar to that prevailing during the first experience. But, because of the high domestic inflation rate, the average nominal devaluation was much larger in the second period (see table IV.2); there were "crawls" as large as 18%, and within a two-week period in March 1975 the cumulative effect of two jumps was a 40% change. Thus, adjustments were not "frequent" enough to constitute a systematic process of minidevaluations.

[10] The official rate of increase of the index of consumer prices in the twelve-month period ending in August 1973 was 304%; an estimate of the incidence of black market prices increased the rate to 402% (Yáñez, 1979).

[11] The nominal broker's rate was revalued until May 1974, bringing it closer to the bank rate. Also a tax rate of 53% was reduced to 13% in August 1974 and eliminated in February 1975.

[12] Apart from import tariffs, the value added tax (VAT) with a rate of 20%, based on taxation according to the destination of products, meant that importers of goods paid more per dollar purchased and exporters (who were exempted from the VAT) received more per dollar sold.

The real forward bank rate experienced a significant net increase between 1974 and January 1976 (see table IV.3, col. 1). The improvement was directly determined by the behavior of the copper price. During the first ten months following the coup, the effective price of copper in Chile was the highest recorded in recent decades, but in the second half of 1974 it fell abruptly while imports continued mounting. The cycle led first to real revaluations and then to an accelerated process of devaluation that involved a 38% change in the RER between average 1974 and January 1976.

(Table IV.3)

The fears of a balance of payments crisis had been superseded during this period by a severe recession. Despite the seriousness of the problem, import liberalization had continued: the average nominal tariff had been reduced (between mid-1974 and January 1976) from 67 to 44%. Real devaluations compensated approximately for the average fall in nominal restrictions on imports during this subphase, and both factors combined to enhance the competitiveness of exports. A 98% rise in nontraditional exports in 1974-77 covered one-third of the loss of copper export proceeds; exports were fostered by greater competitiveness (including preferential tariffs in the Andean Pact) and by the capacity left unused by a drastic restriction of aggregate demand (see chap. III). This latter phenomenon, linked to an anti-inflationary policy shock, generated a large drop in imports, which contributed to the bulk of the external sector adjustment. Thus, more balanced trade was achieved, but GDP declined by 17% in 1975 (Marcel and Meller, 1986), and open unemployment rose to 21.9% (including emergency employment programs; excluding them, the figure was 16,6%).

Subsequently, a growing balance of payments surplus (owing to the external credit boom experienced by Chile since 1976) and a rising monthly rate of inflation invited a change in the trend of the RER. In the remainder of the phase, the real rate fell rapidly, with gradual adjustments below net inflation, losing 14% in the last five months. In this same period, import liberalization became effectively more drastic because tariff reductions already had a clearly lower redundant component (the average tariff was reduced from 44% to 33%). Now they came together with a RER appreciation rather than the reverse, as the authorities had repeatedly announced.

ii) The abrupt revaluations phase

The second phase began with an abrupt revaluation of 10% in June 1976, which represented a notorious change in the policy and caught public attention not so much because of its intrinsic economic effects but because of the conditions and arguments that surrounded it.

The main characteristics of the second phase, which covered the period up to February 1978, were the daily frequency of minidevaluations, according to schedules announced monthly, and a series of four abrupt changes (two revaluations and two devaluations).

The June 1976 revaluation was announced with great fanfare. After an introductory speech by General Pinochet, the minister of finance read a series of policy announcements. The main one was the already mentioned 10% revaluation. Beginning in July, the rate would be adjusted daily; during July, the ER would be devalued by 5% (compared to the 12% inflation in June), and adjustments in each of the following months would be equal to the inflation rate of the immediately preceding month.[13]

The minister argued that (i) in 1975 the ER had increased faster than domestic prices, producing an "unrealistic" ER that was not sustainable in the long run; (ii) the new parity would be adjusted systematically because its new level was realistic; (iii) the new system would allow the exporter to work with certainty; (iv) the revaluation would reduce industrial costs and inflation from July onward, thus, he asserted, increasing real wages; (v) imports and economic activity would be fostered by revaluation; and (vi) money expansion originating in net reserve purchases by the Central Bank would be reduced.[14]

The decision to revalue can be traced to a combination of factors. First, economic policy was under heavy attack from government supporters. The monthly rate of inflation had been rising, complicated by a slow recovery from the downswing in economic activity achieved by the policy approach taken in 1975, and open unemployment was at a very high level. It appeared that a spectacular event was needed to ensure the survival of the drastic orthodox policies being imposed. Second, the purely monetarist approach to stabilization (*à la* Friedman) had been weakened by the negative experience with the dynamics of inflation in previous months (Foxley, 1983). Thus, the

[13] There was no mention of external inflation; nor was that issue systematically developed in the literature concerning real exchange rate measurement. See the contrasting estimates of RER in the 1960s in Ffrench-Davis (1973) and Behrman (1976).

[14] Speech of the minister of finance, 29 June, 1976, in DIPRES (1978, pp. 261-62). About 80% of the changes in high-powered money had been originating in the net purchase of reserves.

emphasis was placed on the anti-inflationary effect that a widely announced revaluation could exert via expectations.[15] Third, an overall balance of payments surplus allowed the authorities to "burn" foreign currency, which would also contribute to a reduction in the printing of money.

The fact is that all the weight of the government-controlled mass media was put into promoting the newly announced policy. The revaluation actually did change expectations, reducing the monthly rate of inflation to 6% in August and September; but it stagnated at that level for two quarters. The minister of finance announced in March 1977 a new revaluation of 10%, with the set of minidevaluations fixed at 4 and 3%, for March and April, respectively. This was to be followed, again, by adjustments according to the rate of inflation in the preceding month. Most of the arguments provided by the government were the same as those given for the first revaluation, though with more emphasis on the assertion that exports (except for "marginal" ones) would hardly be affected because the ER "was 20% above October 1973 and only slightly below the average of the second semester of 1976".[16] The rate of inflation was indeed reduced to 3 or 4% a month, but it again stagnated at the new level.

Despite the first revaluation, the overall balance of payments showed a positive performance. In 1976, there was a surplus in the trade account and also, which was extremely unusual, in the current account. This fact facilitated the March 1977 revaluation. But the surpluses, despite a low price for copper, were the result of the drastically depressed level of aggregate demand, reflected in low imports. This situation was notably reversed in 1977 and 1978 in response to some recovery of aggregate demand, tariff reductions, and an appreciating RER. The consequence was the appearance of a sizable deficit in the current account, which was more than compensated for by financial inflows.

In the second half of 1977, two abrupt, though relatively small, devaluations took place: 6% in August, and 4% in December. The former was compensated for by a fall in tariffs that

[15] The orthodox closed economy monetarist approach to inflation that had prevailed until mid-1976 was questioned by the appearance of an open economy monetarist approach, to which most official economists seemed to have been converted rapidly. The predominance of the latter approach appeared to be definitive when the nominal ER was pegged three years later. It is curious that economists who in the previous period had stated that if the money supply was held constant the ER would have no effect on the level of prices later argued that the ER determines the price level. Trade liberalization does not justify such an extreme change of approach. Thus, we witness, once again, the importance of fashion in economics at the expense of pragmatism.

[16] Speech of the minister of finance, 4 March, 1977, in DIPRES (1978, pp. 308-9). The official figure clearly overestimated the RER. See table IV.3; and McKinnon (1977, table 5). Recall that the official CPI rate systematically underestimated actual inflation.

corresponded to an anticipation of the "final" step of the trade liberalization process, by which customs duties would be limited to the range 10 to 35%. Thus, supposedly the import tariff liberalization process had ended in August 1977 (DIPRES, 1978, p.337).

Nonetheless, in December the minister of finance announced that tariff discrimination was to be suppressed, gradually establishing between December 1977 and June 1979 a uniform tariff of 10% (DIPRES, 1978, p. 358-59). In order to compensate for the average effect of the tariff reduction made in December, there was a devaluation of 4.3%. Again, with the purpose of influencing price expectations, daily rates of minidevaluations were announced for the two following months, totaling 2.2% for December (the official inflation rate of the previous month) and 3% for January. It was asserted that subsequently the ER would be increased slightly faster than the previous month's domestic inflation in order to compensate for the concomitant import liberalization. This was not done, however, because the policy was changed shortly afterward, in February 1978, bringing an end to the second phase.

The ER was assigned a quite different role in this second phase. The higher frequency of adjustments could be associated with the purpose of making real rates more stable. However, the changed role of the ER made the real rate more unstable. In fact, the appreciating trend of the RER, which began in January 1976, continued until mid-1977. Then it resumed a depreciating trend, reinforced by the two forward jumps. During the last part of the phase, the RER improved by 16%[17], after having lost 26% during the first year of the phase, with a net appreciation of 15% (see table IV.3). In the meanwhile, nominal average tariffs had been reduced from 33% to 16% (see table III.1).

The exchange rate was used actively as an expectation builder. Previously, according to widespread government arguments, expectations could not be regulated efficiently except through monetary policy. In this phase, on two occasions the ER was assigned the role of a substitute for monetary policy in that field, and it fulfilled this assignment rather well. Of course, its efficiency was related to the specific economic framework that had prevailed since 1974: expectations of price fixers (entrepreneurs) built strongly on the behavior of prices in the preceding month in the absence of a clearer anchor.

[17] In this period, an external inflation of 17% was a crucial variable in explaining the RER trend. The high external price index was the result of growing inflation in developed countries and a U.S. dollar devaluation.

On the other hand, the RER movements were strongly influenced by short-run fluctuations in the balance of payments. Reserves responded to changes in imports tied to the downswing and recovery of GDP, to large capital flows, and to exchange rate adjustments that destabilized the resource allocation. Given the instability of reserves, the role assigned to the ER made the real rate notoriously unstable during the phase. The transmission of instability to the RER implied the usual misleading signaling to producers of tradables. This was reinforced by the fact that the Chilean economy was now clearly more open to trade; thus, price relations and the allocation of resources were more influenced by changes in the ER than they were in the 1960s. The economy was also more open to capital inflows, which were now operated predominantly via the private sector. The significant ups and downs of the RER, coupled with high domestic interest rates, brought sizable capital gains to borrowers of foreign loans (Zahler, 1980).[18]

The phase ended in February 1978 when the monthly schedule was replaced with a daily schedule for the remaining eleven months of the year. The formula used in the previous eighteen months, based on endogenous nominal ER dependent on previous inflation, was replaced with an exogenous schedule, determined by the annual inflation target.

iii) The final phase: toward the return to a fixed rate and the crisis

In February 1978, the minister of finance announced a schedule of daily changes of the ER that contemplated decreasing adjustments, starting with 2.5% (roughly the official rate of inflation in the previous three months) and ending with 0.75% for December. He asserted that "given the excellent balance of payments situation, the opening to foreign trade and the announcement of the exchange rate for 1978, competitive imports would rapidly enter if prices of domestic products were increased excessively", and that "the government is providing the foundations, so that 1979 will mark the start of a period of unprecedented price stability".[19] On this occasion, the content of the official announcement, and of conferences and interviews of several government representatives, gave the impression that, more than the regulation of expectations, the crucial factor was the belief

[18] In chapter V, estimates of differentials between domestic and external interest rates, and of the funds involved in these operations during 1975-82, are provided.
[19] Speech of the minister of finance, February 3, 1978, in DIPRES (1978, pp. 369-71).

that the economy was already so open that the *law of one price* would apply.[20]

Domestic inflation, measured by the official CPI, fell from 64% in 1977 to 30% in 1978 (from 84 to 37%, according to the corrected CPI). This apparent success led to the adoption of the same approach for the following year. In December 1978, a schedule of daily adjustments was announced for 1979. The compound annual rate of devaluation to be implemented was 14.7%, similar to the rate of inflation that had been announced informally as the rate expected for that year. There was no consideration of either external inflation (which was over 14% per annum in 1978-79) or the declining gap between effective and potential GDP. If it was to be true that the law of one price applied, exchange rate policy would clearly lead to inflation above 15%. It is possible that the economic authorities were still in transition from an expectations theory to a *law of one price* approach.

The fact is that during the first half of 1979, instead of decreasing, inflation began to rise. In the twelve-month period ending in June, inflation was 35%. All indicators signaled that inflation, rather than being reduced by half, as announced by the government, would be higher than in 1978.

This last phase ended abruptly in June 1979 with the freezing of the ER at a level 5.7% above the level prevailing then; the new level anticipated the rate schedule for the end of the year.

By mid-1979, after almost six years of several policy variants and oscillations of the RER, the rate was at a level close to that established at the outset. However, during the process import restrictions had been drastically reduced: most nontariff obstacles disappeared, and tariffs were reduced from an (unweighted) average of 94% to a flat 10%. Additionally, the ER was fixed in a context of 35% inflationary trend.

When the ER was frozen in June 1979, it was asserted that it would be maintained until February 1980, "bringing more stability to the external sector, without danger for a reasonable equilibrium in the balance of payments". A brake would be put on price increases, and inflationary expectations would be reduced. It was strongly emphasized that credit availability and public expenditures would be significantly restricted, and thus traders would not be able to transfer all of the RER increase to prices.[21]

[20] This law implies that domestic and external prices of tradables, corrected by tariffs and ER, are equal. As a result, it is argued that in a small country domestic prices have no ability to change except through tariffs or ER changes. According to the extreme view, prices of nontradables similarly have no autonomy because they are determined by their interrelation with tradables through goods and factors markets.

[21] Speech of the minister of finance, 29 June 1979. Additionally, the spread between the selling and buying rates applied by the Central Bank was increased to ±2%.

The ER was held at $39 per dollar up to mid-1982. In that three-year period, there was real appreciation by one-third. Annual domestic inflation decreased from 35% to less than 10%, but during the transition a disequilibrium between external and domestic prices by the magnitude mentioned arose. As a result, in order to return to the previous level of RER, in appearance estimated as one of equilibrium by authorities (McKinnon, 1981, p. 34), a domestic inflation 30 points lower than the external one was required. During the last months of 1981 and the first semester of 1982, a slight domestic deflation was registered.[22] But, in parallel, unemployment increased sharply and a rapid fall in the production of manufactures occurred.[23]

The fact is that, after some months of automatic adjustment, the outcome was disastrous. An initiative to accelerate the adjustment process, through a legal reduction of nominal wages, could not be imposed by the economic team. An abrupt devaluation was applied in June 1982 by a new minister.

The initial devaluation was 18%, and a table of minidevaluations was announced. Then a totally flexible exchange rate regime, with free access (with immediate huge outflows by the market), was implemented. Subsequently, a system of bands and minidevaluations, based on past inflation and a regulated access to the foreign exchange market, was developed (see chap. VI).

"The commitment to reduce inflation has the highest priority for the government; given that reserves continued to grow because of capital inflows, it would be feasible to keep the nominal exchange rate fixed in 1980, notwithstanding its real appreciation.[24]

Supporters of a permanent freezing include, of course, importers of consumer goods, and those influenced by the monetary approach to the balance of payments. The response of non-tradables prices in periods of accumulation of reserves and of their output during decumulation periods, and the slow speed with which the law of one price applies to tradables, are crucial. Apart from the standard criticism of the optimistic assumptions in these two areas, the critical view brings into the discussion the belief that (i) the present ER is too appreciated (the deficit on current account amounted to 7% of GDP in 1978 and import liberalization has not yet exerted all its effects); (ii)

[22] On the one hand, the wholesale price index fell by 8% between May 1981 and May 1982. Also the CPI declined 1% between February and May 1982. On the other hand, international markets exhibited negative inflation as well: the external price index fell 4% in the first half of 1982 as a result of a U.S. dollar revaluation.

[23] Open unemployment (excluding public emergency programs) grew from 11 to 23% between September 1981 and June 1982. Value added of manufacturing fell 21% in 1982.

[24] The original study was finished in November 1979. Here I have deleted several paragraphs on the conjuncture from the version published in Williamson (1981). However, two paragraphs, slightly abridged, that contain my views about what I expected would happen in the next years, have been retained.

monetary management will be based on deeper restriction of public expenditure, with a low public investment and quality of basic social services; (iii) the large overall unemployment is concentrated more heavily in industries producing importables, and non-tradables that usually have been highly dependent on public-expenditure; and (iv) the probable changes that the economy will continue to suffer, either from external or domestic origin, are difficult to predict. A crawling peg policy provides flexibility to adjust to deviations from predictions, while the fixed nominal ER makes abandoning the parity traumatic. Consequently, pegging the nominal rate imposes a harder adjustment process on the real economy, though in the next months it will probably contribute to more stability of the price level.

The appreciation that the real ER will probably suffer will tend to have a negative effect on employment, economic activity and investment. In fact, on the one hand, the desubstitution of importables will be encouraged. On the other hand, investment, which is already low, will tend to be deterred by the uncertainty with respect to the level of the ER and its corresponding impact on market comparative advantages; this could be particularly relevant with respect to investment in exportables. Despite its probable negative effects, the present policy might be retained for a rather long period. First, the external payments situation looks favorable in the near future because the price of copper will probably increase, as usual overshooting the normal level. Second, gross reserves are large, and can support an increased deficit on current account. Third, foreign capital in sizable amounts should still continue to flow despite the fall in domestic interest rates and the real ER appreciation; given the nominal ER, the dollar equivalent of domestic annual interest rates is still over 40%; real appreciation adds a growing risk, but experience shows that a large deterioration can accumulate before international lenders react, as long as the other 'attractive' features of the model remain in force" (Ffrench-Davis, p. 168-69, in Williamson, 1981). All this, what we were predicting in 1979, happened in the following two years and ended in the collapse of 1982.

3. Final remarks

My concluding remarks can be divided into two groups. The first are related to some of the answers that the Chilean experiences suggests and the second to some of the questions that remain open.

a) Some lessons

This discussion will touch on four points, which refer to (i) the feasibility of changes in the RER, (ii) expectations, (iii) stability, and (iv) the correction of policy errors.

The two experiences show that not only the nominal rate but also the RER can be modified substantially by means of policy decisions. The law of one price, even in an economy as open to trade as the Chilean one, has limited validity. In particular, lags can be very long and imply imbalances for several years, generating wrong signals, misallocation of resources, and a low rate of productive capacity utilization. In fact, there is a wide range of outcomes characterized by multiple equilibria and RER for a long time far from its medium-term sustainable level.

In the cases analyzed here, the main variables interacting with the ER have been the terms of trade, the level of economic activity, and external financing. Notwithstanding, the relation of the ER with other macroeconomic variables can also suffer drastic and persistent changes: in 1973-79, wages were depressed by a policy decision at the outset, and the wages/ER ratio remained at levels one-third to two-thirds that of the ratio prevailing in 1970 (table IV.3, col. 2); on the other hand, domestic interest rates fluctuated widely and departed drastically from parity relations with international markets (table IV.3, col. 4).

The effect of the ER on inflationary expectations is closely tied to the specific policy design adopted. Different variants of the crawling peg have divergent effects. A policy of the sort implemented in the first period, and to some degree between October 1973 and June 1976, reduces the impact on expectations of changes in the ER. On the contrary, the widely announced annual schedule of the ER established in 1978 operates in the reverse direction; as such, it can be used "actively" to regulate expectations, but simultaneously it behaves "passively" if the objective is to alter the RER. The larger the influence on expectations, the less will be the degrees of freedom to modify the RER; the extreme case is that of the nominal peg. Of course, the net effect depends on how well other variables that influence expectations and production costs are performing.

The behavior of the ER seems to have a significant influence on nontraditional exports. In both experiences exports expanded and diversified (Ffrench-Davis, 1979b, tables 4 and 6). This phenomenon is the result of multiple variables, but the depreciating trend and the larger stability of the crawling peg, compared to the jumping peg or the purely free float, seem to have played a

positive role.[25] The greater stability of the real rate also tends to deter speculative movements, which were frequent with the fixed peg. However, if the RER policy responds to short-run changes in reserves, the policy can become destabilizing and replicate the overshooting of a free exchange rate, as happened partially during the second experience. Consequently, changes of the RER that try to avoid large fluctuations, away from the trend suggested by the real economy, seem to provide improved allocative signals and increase the demand for domestic assets.

Finally, a crawling peg policy, managed with flexibility by the economic authorities, appears to make it easier to correct disequilibria resulting from errors in predictions in the trend of relevant variables, when these can be corrected via adjustments in the nominal ER. One obvious case relates to the adjustment in response to import liberalization. The managed flexibility increases the feasibility of avoiding balance of payments crises and cumulative disequilibria.

b) Some open questions

When the world and the domestic economy are in equilibrium, there is no need for changes in macroeconomic price relations. But the world economy is changing and is not in equilibrium: neither natural resources nor capital markets seem to be in long-run equilibrium. These conditions recommend a managed flexibility in ER policy –of the sort that a crawling band can provide– in order to face the corresponding structural adjustment in the real economy.

It is important to identify the circumstances under which permanent ER adjustments must be made, for instance, in response to autonomous changes in the terms of trade, the composition of domestic output, or the foreign capital supply. Furthermore, it is crucial to determine what to do with respect to transitory changes. The general line seems to be to stop their transmission to the ER. But there are two aspects that call for some flexibility of the RER. One is that ER policy is seldom sufficient by itself to avoid the transmission of instability; there is also a need for other policies, such as fiscal, credit-monetary, and foreign debt policies, each one implying some cost. What is the optimal mix of policies? The other refers to the implications of uncertainty or limited knowledge. It is impossible to distinguish the exact frontier between normal and transitory components of the balance of payments; in fact, there is a range where the frontier is ambiguous. Thus, in order to minimize policy failures, it is convenient to accept some instability in the short

[25] Econometric data referring to 1974-75 support this hypothesis (Behrman, 1976, table 7.2). See also ECLAC (1998, chap. IV).

run; this can contribute to avoiding the forced adjustments that are necessary in the long run when errors accumulate. Where is the optimum cutting point and what are the components of trade that must be "normalized" as an input for policy purposes?

One recurrent feature has been the enlarged size of private capital flows and the associated abrupt changes in reserves and base money observed in different historical episodes in Chile. Their effects are far from neutral: (i) funds accrue mostly to some segments of the domestic economy and (ii) the response of authorities has sometimes been to appreciate the RER or (iii) to diminish public expenditure as a compensating mechanism. This problem is related to the questions of what the actual capacity to absorb foreign funds efficiently and how stable the supply is. It is extremely doubtful that these questions can be answered optimally by the market (see ch. X). What price or direct mechanisms can operate better to manage capital flows in the case of small and medium-sized emerging economies?

Answers to these questions would contribute to further improving the design of a crawling peg policy, with managed flexibility, that would make the evolution of the Chilean external sector much smoother than it was with the jumping peg, which a new policy allowed the economic authorities to devote more effort to other policy areas and contributed to a significant expansion and diversification of exports.

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Table IV.1
MACROECONOMIC INDICATORS, 1964-82

	1964	1965	1969	1970	1972	1973	1974	1978	1980	1982
1. GDP Index (1970=100)										
a) Total	78.9	83.0	96.5	100.0	107.9	103.6	109.2	109.4	124.7	112.6
b) Per capita	89.4	91.9	98.3	100.0	104.0	98.2	101.9	96.1	106.3	93.0
2. Industrial value added Index (1970=100)										
a) Total	78.8	83.8	98.7	100.0	116.9	109.3	108.3	92.9	101.9	79.5
b) Per capita	89.2	92.8	100.6	100.0	112.7	103.6	101.0	81.6	86.9	65.7
3. Investment rate (% of GDP)	21.4	19.9	19.6	20.4	14.8	14.7	16.5	14.7	17.6	15.0
4. Unemployment rate										
a) Open	7.0	6.4	6.0	5.9	4.0	4.8	9.1	13.8	11.7	19.6
b) With PEM	7.0	6.4	6.0	5.9	4.0	4.8	9.1	18.0	16.9	26.1
5. Inflation rate (Dec.-Dec.)	40.4	27.3	33.1	36.1	260.0	606.1	369.2	37.2	31.2	20.7
6. Real copper price (1977 dollar cents)	73.1	85.0	139.1	120.1	85.2	120.1	113.3	54.6	68.5	46.6
7. Fiscal Surplus (% of GDP)	-4.0	-4.3	-0.8	-3.5	-14.1	-10.5	-6.6	2.2	5.5	-2.3
8. Current Acc. Balance (1977 million dollars)	-312.8	-131.1	-185.4	-166.7	-689.2	-442.0	-256.2	-960.4	-1,361.0	-1,599.7
9. Balance of payments [a] (1977 million dollars)	-55.6	-108.2	269.8	233.3	-411.5	64.6	-162.7	628.5	859.2	-808.7

Sources: Lines 1 and 2 based on Marcel and Meller (1986). Line 3 based on Central Bank of Chile data. Line 4, based on Jadresic (1986). Line 5 shows the CPI rate of annual change. The 1964-69 period is from Ffrench-Davis (1973). The 1970-78 period is from Cortázar and Marshall (1980) and official INE figures. Lines 6, 8, and 9 are from Ffrench-Davis and Tironi (1974) and Central Bank of Chile data, deflated by the external price index from Ffrench-Davis (1984). Line 7 is from Larraín (1991).

[a] Up to 1972, international reserves include private sector reserves; from then on, they correspond only to Central Bank reserves.

Table IV.2
NOMINAL ADJUSTMENTS OF THE EXCHANGE RATE, 1965-76

Date	Number of adjustments	Average number of days between adjustments	Rates of adjustment (%)		
			Maximum	Average	Minimum
	(1)	(2)	(3)	(4)	(5)
1965 (May-Dec.)	8	30.0	2.9	1.52	0.4
1966	12	30.4	2.3	1.75	1.2
1967	16	22.8	2.4	1.78	0.7
1968	24	15.3	1.9	1.17	0.8
1969	19	19.2	1.7	1.40	0.8
1970 (Jan.-July)	12	17.6	1.9	1.71	1.4
1973 (Oct.-Dec.)	3	30.7	19.3	9.00	1.8
1974	24	15.2	15.9	7.16	3.3
1975	26	14.0	18.2	6.06	1.8
1976 (Jan.-June)[a]	18	10.1	-10.1	3.35	0.9

Source: Central Bank of Chile, *Boletín Mensual*, various issues.

Note: Refers to the so-called Forward bank rate.

[a]After June 1976, adjustments were made daily.

Table IV.3

EXCHANGE RATE, WAGES AND INTEREST RATES, 1965-82

	Real exchange rate index (1970=100)	Real wage indexes (1970=100)		Real interest rate
		Deflated by exchange rate	Deflated by CPI	
	(1)	(2)	(3)	(4)
1965	80.1	84.1	67.3	-0.5
April	77.8			
1966	84.2	89.6	75.4	8.8
1967	91.0	94.2	85.7	10.8
1968	95.6	89.5	85.6	6.5
1969	99.0	92.8	91.8	5.6
1970	100.0	100.0	100.0	6.9
July	104.7			
1973	83.9	56.0	82.0	n.d.
October	113.4			
1974	130.5	45.0	64.8	n.d.
1975	179.0	31.9	62.0	121.0[a]
1976	144.6	49.8	65.0	51.2
January	180.7			
June	155.9			
July	130.8			
1977	120.3	60.6	71.0	39.4
July	114.8			
1978	133.5	58.1	75.0	35.1
February	133.1			
1979	133.4	64.3	81.8	16.9
June	131.1			
1980	116.6	80.1	88.9	12.2
1981	99.2	102.6	96.8	38.8
1982	115.1	88.2	97.1	35.2
June	90.0			

Sources: For 1965-70, Ffrench-Davis (1973); for 1970-82, based on figures from the Central Bank of Chile, Cortázar and Marshall (1980); and Ffrench-Davis (1984).

Note: In col. (1), nominal exchange rates were deflated by CPI and inflated by the Chilean external price index (EPI). Monthly figures are given when important changes in exchange rate policy occurred. Cols. (2) and (3) have as a numerator the General Wage Index by INE, and as denominator changes in CPI and in nominal exchange rates multiplied by the EPI, respectively. Col. (4) shows the annual nominal interest rate, deflated by CPI.

[a] Second semester, after the interest rate liberalization.