EXCHANGE RATE POLICY MANAGEMENT IN CONDITIONS OF CURRENCY ABUNDANCE*

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One of the most relevant macroeconomic phenomena of recent years has been a persistent revaluation of the peso. This paper puts forward the hypothesis that peso revaluation has been an equilibrium phenomenon, i.e. explained by permanent factors, and although measures have been taken to modify the trajectory of the real exchange rate (and others could be taken), in practice, the benefits of these measures have been dubious, and they probably only slightly delay the downward trend. In view of this, the authors propose concentrating efforts on making peso revaluation compatible with the least possible resource allocation costs, while enhancing the efficiency and productivity of the different economic activities. Similarly, they argue that it is vital to confront this phenomenon realistically, as its dynamic aspects will necessarily lead to the contraction of some productive activities and the possible disappearance of others. However, they conclude that this should not be perceived as negative, but rather as one of the signs of development.

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Introduction

Whichever one way looks at it, the real exchange rate in Chile has been on a downward course since 1990: in other words, the peso has been systematically strengthening against the dollar.

This trend in the local currency has naturally raised questions concerning its possible effects —especially if the trend continues over time— on the dynamism of the export sector and on the sustainability of the process of revaluation without generating a balance of payments crisis.

Equally, there has been extensive discussion on whether peso revaluation has or has not been, at least partly, an inevitable process, with emphasis on possible responsibilities in the fiscal arena (excessive spending growth), or monetary field (keeping interest rates too high).

In line with this, two kinds of proposal have been put forward; one favoring a more interventionist approach in the exchange market, positing the need to intensify controls on capital movements, and another more liberal one that seeks to eliminate the restrictions that still exist. Both approaches, but especially the first, seem to us to be mistaken, as they ignore the existence of an underlying trend towards peso strengthening which cannot be reversed by measures of this type.

This paper reviews evidence on the behavior of the exchange rate according to different definitions, and on the evolution of the export sector, and this is followed by a brief review of theory regarding the determinants of the real exchange rate, along with the empirical evidence. Exchange rate policy management in recent years is critically discussed, and the article attempts to explain the origin of the trend towards peso revaluation in this period, as well as indicating how to confront it. The paper ends with a summary and conclusions chapter.

1. Evolution of different real exchange rate concepts and exports

In a world where all prices remain constant and productivity does not change over time, the evolution of the nominal exchange rate is an appropriate measure of the purchasing power of the local currency, as well as national competitiveness and, ultimately, the real exchange rate.

But in a world where the above does not hold and there are changes in both absolute prices (inflation) and relative prices, as well as in the

efficiency with which production is carried out,[1] the evolution of the nominal exchange rate is not a good indicator of the real exchange rate. As well as the well-known index number problem, there is the problem of the existence of different indicators of domestic and foreign prices which can be used to calculate the real exchange rate.[2]

The mostly widely-used indicator in Chile is that calculated by the Central Bank, which deflates the nominal exchange rate by the CPI and multiplies by an index of foreign inflation, constructed from the producer price index, in dollars, of our main trading partners, weighted by their importance in Chile's trade. This indicator has been available since 1977 (see Central Bank Index, Table Nº 1, and Figure Nº 1).

TABLE Nº 1 ALTERNATIVE INDICATORS OF THE EXCHANGE RATE
(ANNUAL AVERAGES AND RATES OF CHANGE)
($ AT 1994 PRICES)

	Central Bank Index	Rate of change	Wage deflator	Rate of change	Total export prices	Rate of change	Non-copper	Rate of change	Non-traditional	Rate of change
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1977	237.4	434.6			n/a		n/a			
1978	302.2	27.3	453.8	5.4	n/a		n/a			
1979	311.8	3.2	425.3	-5.3	n/a		n/a			
1980	270.9	-13.1	336.1	-20.2	n/a		n/a			
1981	236.0	-12.9	269.3	-19.1	n/a		n/a			
1982	263.0	11.4	305.7	14.6	n/a		n/a			
1983	314.3	19.5	402.4	32.9	n/a		n/a			
1984	329.3	4.8	423.7	6.4	n/a		n/a			
1985	404.7	22.9	542.7	29.4	478.7		543.2		565.0	
1986	445.7	10.1	583.7	8.6	492.5	2.9	574.8	5.8	569.7	
1987	464.8	4.3	610.1	5.6	535.6	8.7	602.1	4.8	584.7	
1988	495.5	6.6	610.2	1.0	671.1	25.3	642.2	6.7	612.8	
1989	483.9	-2.3	584.6	-3.2	651.3	-3.0	599.3	-6.7	597.6	-2.5
1990	502.2	3.8	594.6	2.7	554.2	-14.9	526.1	-12.2	529.5	-1 1.4
1991	474.1	-5.6	534.6	-9.2	513.8	-7.3	518.8	-1.4	516.9	-2.4
1992	435.9	-8.1	471.7	-10.9	452.7	-11.9	456.2	-12.1	465.3	-10.0
1993	431.6	-1.0	452.4	-3.1	400.0	-11.6	420.6	-7.8	455.0	-2.2
1994	420.2	-2.6	420.2	-6.2	420.2	10.0	420.2	-.).1	420.2	-7.6

Source: Central Bank of Chile and authors' own estimates.

[1]Not to mention modifications to trade restrictions, taxes and domestic subsidies, environmental regulations and others affecting the competitiveness of the different productive activities.

[2]In the appendix of Edwards (1988), there is a good review of alternative indicators of the real exchange rate.

FIGURE Nº 1 REAL EXCHANGE RATE 1977-1995

<< INSERT FIGURE 1>>

Source: Central Bank of Chile, Base year 1986=100

Alternatively, the foreign price indicator can be replaced by effective export prices, which would bring us closer to an indicator of export competitiveness. This index of the real exchange rate, in turn, can be divided by sector and subsector, to show more precisely the different realities that exist in terms of competitiveness trends. Notwithstanding this, it is interesting to analyze the Central Bank's real exchange rate indicator, available since 1977, precisely because of the length of the available series.

A breakdown of information on the real exchange rate adjusted by export prices can be made, for example, between non-copper and non-traditional exports (see Table Nº 1), but this does not reveal significant qualitative changes compared to what has already been commented on regarding the global index.

An initial conclusion that can be drawn from an observation of the Central Bank series is that the real exchange rate (1994 average) is nearly 64% higher than the average for 1977-79, a period when the process of economic opening was forcing national producers to confront foreign competition for the first time, and the balance of payments situation was sustainable.[3] The passage of time has allowed for productivity improvement and a process of learning to live in a competitive and globalized world, which makes the 64% difference

[3] Between 1977 and 1979, total exports grew at a rate of 21.9% per year (40.8% in the case of non-copper exports), despite which there was a trade deficit which averaged US$ 249 million (1.5% of GDP) due to a sharp deterioration in the terms of trade compared with previous years. The current account deficit averaged US$ 943 million (5.7% of GDP) and the balance of payments surplus averaged US$ 626 million (3.8% of GDP).

seem even more difficult to justify and leads to the conclusion that the equilibrium exchange rate could even be considerably lower.

A second observation is that the exchange rate peaked between 1988 and 1990, a period when (i) capital flows were small, (ii) the normalization of external accounts was being concluded after the debt crisis and (iii) there was great uncertainty regarding the development of the political situation in the country. Compared with the average for that period (494 pesos) the current real exchange rate has been revalued by 14.9%, equivalent to 4% per year, a figure that does not seem excessively high. The comparison does not change much if it is based on the historically highest value in 1990.[4]

Finally, the average exchange rate for 1994 was higher than any exchange rate recorded up to 1995, so if it is compared with the 1986-87 average, the accumulated revaluation amounts to just 7.7% (1.1% per year). These comparisons show that, measured against periods when considerably less favorable balance of payments conditions prevailed and when the terms of trade were not significantly different (see Table Nº 2), the real exchange rate at the present time is probably very high or, at least, has not fallen too far.

These indicators are certainly not perfect, as they do not take into account increases in sectoral productivity, for which it would be necessary to use an indicator of unit costs to deflate the nominal exchange rate instead of the CPI, or else an index of non-tradable prices, which would be the theoretically most correct alternative.

Despite these objections and by way of illustration, Table Nº1 includes the Central Bank series deflated by an index of wages and salaries instead of the CPI. The reason for this is that the wage index might be a better indicator of production costs than the CPI, and so the resulting measure of the real exchange rate might be more representative of the economy's overall competitiveness.

This series shows that the exchange rate reached its lowest point in 1994, apart from the period 1980-83, and its level is 29.3% below that of 1990, representing a fall of 6.6% per year. If this series is arbitrarily corrected to incorporate productivity improvements, the changes are notable. It is enough to assume a productivity increase of 3% per year[5] for the current

[4] In this case the accumulated revaluation is 16.3%, representing 4.4% per year. These figures also seem modest when they are compared with the revaluation produced between 1979 and 1981: 24.3%, which represents an annual rate of 13% and shows that the two events are not comparable.

[5] When one considers that real wages between 1977 and 1994 grew at an average annual rate of 3.7%, the application of productivity increases of 3.0% per year does not seem excessive.

(1994) exchange rate to be above that of every year prior to 1995, and its decline compared to 1990 is reduced to 20.5% (4.8% per year).

Notwithstanding the above, it is clear that exchange rate figures deflated by the wages index show a more adverse picture than the Central Bank series.

On the other hand, the index of foreign prices employed by the Central Bank is a theoretical concept which probably relates to true prices only in the long run, as the transmission of exchange rate and other shocks affecting the price indexes of the countries included, are not passed on directly and immediately either to export or domestic prices. For this reason it makes sense to calculate the real exchange rate by replacing the index of foreign inflation by an index of export prices (Columns 5 to 10 in Table Nº 1).

Despite these, and possibly other defects, the selected indicators all tell a similar story and almost certainly are a faithful reflection of reality, although the speed of the changes may vary. This evidence, therefore, documents the peso appreciation of recent years.

Table Nº2, on the other hand, presents information on the evolution of the terms of trade and the quantum of total exports, according to information prepared by the Central Bank.

The evolution of the terms of trade, during the period under analysis, has not been relevant for the behavior of the real exchange rate under any of the definitions that can be used. Indeed, although there is a big difference (40%) between the maximum and minimum values recorded during the period, the coefficient of variation is 9.7 % , which indicates that apart from these values there has been relative stability in the terms of trade if several years are considered together.[6]

On the other hand, the export *quantum* has risen continuously since 1985, with average growth of 7.7% since 1981 (9.6% since 1990).[7] This suggests that export dynamism has not been affected by the evolution of the exchange rate in recent years.

[6] If, on the contrary, a clear upward or downward trend was displayed in the terms of trade, a relevant effect could be expected on the equilibrium exchange rate.

[7] The non-copper export quantum, on the other hand, has grown at the rate of 12.9% since 1990.

TABLE Nº2 TERMS OF TRADE AND EXPORT *QUANTUM*

	Terms of trade (1986=100)	Rate of change	Export quantum	Rate of change
1980	116.6		70.7	
1981	98.3	- 15.7	68.3	-3.4
1982	93.6	4.8	77.7	13.8
1983	101.7	8.7	81.9	5.4
1984	96.9	-4.7	81.8	-0.1
1985	90.0	-7.2	92.8	13.4
1986	100.0	11.2	100.0	7.8
1987	104.3	4.3	105.4	5.4
1988	126.4	21.2	113.2	7.4
1989	124.7	-1.4	126.2	11.5
1990	111.8	-10.4	140.7	11.5
1991	111.2	-0.6	150.5	7.0
1992	110.1	-1.0	179.0	14.3
1993	100.5	-8.7	178.9	4.0
1994	112.6	12.0	199.3	11.4

Source: Central Bank of Chile and authors' own calculations.

2. Determinants of the real exchange rate

2.1 Theoretical aspects

In the previous chapter we reviewed alternative measures of the real exchange rate (RER). For the purposes of later analysis, we will use the more general definition (even though it is difficult to measure in practice) of the relative price (in pesos) of tradable to non-tradable goods. Depreciation of the real exchange rate implies an increase in this relative price and therefore an increase in the international competitiveness of the Chilean economy.

The first concept that needs to be defined is the equilibrium RER. The equilibrium RER is the level of this relative price that simultaneously ensures equilibrium in the non-tradables market and the external sector. The latter is in equilibrium when current account deficits and surpluses are sustainable over time in terms of capital inflows and outflows. This means that, in a world of perfect foresight, the sum of current account deficits expressed in present-value terms, over a very long-term horizon should be equal to zero.

As the RER is a real variable, its equilibrium value fundamentally depends on real factors such as the terms of trade, productivity growth between tradables an non-tradables, the structure and level of tariffs, levels of saving and investment, the composition of spending, etc. Now, changes in these variables will have a long- or short-term effect on the equilibrium level of the RER, depending on whether shocks are permanent or transitory, and whether they are expected by agents or not. For example, an unexpected change in one of these variables in a given year, but which returns to its previous value the following year, is considered transitory and will not cause a change in the long-term equilibrium value of the RER, although it will cause a change in the short run. These basic factors explaining the value of the long-run equilibrium RER, are classified by Edwards (1988) into external and domestic. The former include the terms of trade and the international interest rate, for example. Fundamental domestic factors can be divided into those that can be affected by economic policy variables, and those that cannot. The former include trade policy, capital controls, composition of public spending, etc. Among the latter are productivity growth in the tradable sector versus the non-tradable sector.[8]

However, the real exchange rate actually observed in the economy depends, in turn, on monetary variables where shocks affect the level of the RER temporarily. These cause the exchange rate to experience transitory movements, or what goes by the name of "misalignment" with respect to the equilibrium RER. It is precisely these movements that often provoke serious fluctuations in the value of the RER and, for the same reason, generate uncertainty in investment decisions for the export sector, as well as among sectors producing import substitutes and non-tradable goods. Such misalignments are what mainly ought to concern the economic authorities due to their impact on resource allocation and the welfare of the country.[9]

2.2 Empirical evidence for Chile

There is quite extensive empirical evidence on the behavior of the RER, having been analyzed from the standpoint of macroeconomic policy,

[8] Productivity increases can also be induced to some extent by the economic authorities via infrastructure investment, policies to support technological development and human capital.

[9] It should be noted that the development of exchange rate insurance diminishes the significance of short-term exchange rate fluctuations.

as well as from an international finance point of view. In this section we will concentrate solely on providing a synthesis of studies made of the Chilean economy. Table Nº 3 gives a summary of the main conclusions reached by the different studies.

The empirical evidence for Chile is based on questions formulated by researchers when carrying out their statistical analysis. Thus, for example, Le Fort (1988), using quarterly data for the period 1974-1982, studies the impact of changes in absorption and the nominal exchange rate on the RER. He also analyzes the duration of the effects of these changes. The theoretical framework for his estimates is based on three different approaches to the exchange rate problem: the first is a model that assumes wage rigidities via indexation mechanisms; the second assumes wage flexibility, but with sector-specific capital; and the third is based on the theory of purchasing power parity. The wage rigidity model implies that a devaluation will affect the relative price of tradables compared to non-tradables via a change in spending patterns instead of a reduction in absorption. In the specific-factor model, absorption and factor emdowments have direct effects on the RER. In the final model, only the terms of trade, tariffs and technology have an impact on the RER. The wage rigidity model proves to be the best at explaining the behavior of the RER during the period.

The main policy conclusion that can be drawn from this paper is that aggregate demand management alone will not be enough to achieve a statistically measurable impact on the RER, and the magnitude of the short-term impact will depend on the structure of the economy. However, in each of the scenarios analyzed by Le Fort the long-term effect is equal to zero. Taking this result as a benchmark, policies aiming to reducing the fiscal deficit will have a zero impact on the value of the long-term equilibrium real exchange rate. In this sense, changes in the value of the nominal exchange rate are more effective in influencing this relative price.

Edwards (1989), on the other hand, estimates an equation for the real exchange rate over the period 1977-1982, using quarterly data. He finds the main source of real exchange rate appreciation to have been the capital inflow caused by the financial liberalization that occurred during that period. On the other hand, a fall in the terms of trade tended to depreciate the real exchange rate. The phenomenon of capital inflow is now being faced by the Chilean economy once again, albeit with the difference that long-term capital has predominated during the past year. In addition, the improvement in Chile's terms of trade during 1994 has influenced the real appreciation of its currency, although it should be stressed that this effect has only been important in the past year, whereas peso appreciation began in 1991.

Similar results are reached by Agosín *et al.* for the period 1983-1991, using a similar model but with slightly different estimation techniques. This paper aimed to analyze the nature and effects of capital flows into Chile; in addition, it sought to analyze the impact of fiscal spending policy on the RER in the long run. The paper found that capital flows and the terms of trade have a negative influence on the long-run RER, and that the fiscal spending variable's effect on the RER is statistically equal to zero after one year. These results, despite being applied during a different period, are consistent with those of Le Fort (1988) and Edwards (1989) in terms of their policy implications.

From the viewpoint of dynamic econometrics, interesting modeling has been done by Arrau *et al.* (1992), Repetto (1992) and Elbadawi and Soto (1994).

The first of the papers mentioned analyzes the impact of fiscal saving on the real exchange rate. Using the ratio of fiscal spending to GDP as an explanatory variable, the authors find that the effect of this variable is statistically equal to zero, thereby validating conclusions obtained in the Le Fort paper regarding the effectiveness of spending policy in altering the equilibrium RER.

Repetto (1992) statistically analyzes the behavior of the RER from the viewpoint of two theoretical models. The first is based on the purchasing power parity hypothesis, which proves unable to explain the behavior of the real exchange rate in the period 1960-1990. The other model is based on Edwards (1989), where the observed RER depends on present and future values of real variables. Once again it is found that the fiscal spending effect on the RER is nil, whereas the effect of capital flows has been important. In addition, the degree of openness has a positive effect on the RER, which probably explains part of the sharp increase in the RER following economic opening, as well as the fall experienced during the period 1971-1973. Contrary to studies carried out earlier, the terms of trade are found to have a positive impact on the RER; i.e. a improvement in the terms of trade induces a substitution effect in consumption that causes agents to raise their spending on importable goods to the detriment of non-tradable goods.

On this point, it is worth noting that what is relevant is domestic saving, and thus aggregate spending. If government spending is contracyclical, this variable will not necessarily be a good approximation to higher saving. In this sense, it would be more relevant to measure government spending as a percentage of absorption expenditure.

The most recent paper among those analyzed is that by Elbadawi and Soto (1994), which studies the period 1960-1992. This paper distinguishes

current public expenditure from public investment, and finds that the first has a negative effect on the RER, while the second affects it positively. Current public spending is used as a way of capturing expenditure on non-tradable goods, whereas public investment is included as a way of controlling for spending on tradables.[10] The authors also find that long-term capital alone has a statistically significant impact on the equilibrium real exchange rate. As in the study by Repetto (1992), the terms of trade and the degree of openness of the economy are found to have a positive effect on the RER. Elbadawi and Soto conclude by showing that during the period 1988-1992 the observed real exchange rate was above its real equilibrium value, from which it can be concluded that a large part of the fall in the real exchange rate seen over recent years is the result of equilibrium movements and, if there has been a misalignment, this has been upwards.

The two final papers analyzed once again find that capital flows play a predominant role in the observed RER. Furthermore, Elbadawi and Soto (1994) conclude that it is long-term capital entry that has had an impact on the long-term equilibrium real exchange rate, which is to be expected as this type of capital is basically investment in tradable sectors and will generate further currency inflows in the future. The two papers coincide, thereby differing from the previous studies, in that improvements in the term of trade should lead to a real devaluation of the peso. In other words, the price effect will exceed the real income effect mentioned above.

In terms of policy implications, it can be concluded that policies aimed at influencing spending have an effect that disappears over the medium and long term. In this sense, reductions in the fiscal deficit will have a relatively small effect on the RER.

In addition, capital flows are definitely determinants of the path of the real exchange rate. Policies aimed at encouraging outflows or controlling inflows of such capital will help to alleviate downward pressure on the equilibrium RER. But this has other costs, which are analyzed in the following section. This effect of capital flows is closely related to the idea that the most effective way of sustaining a high RER is via nominal devaluations (see Le Fort, 1988), which, in the case of the Chilean economy can be achieved by outflows of capital from the country. In addition, the high level of reserves held by the Central Bank decreases the likelihood of a devalua-

[10] It is debatable whether public investment is better correlated with spending on tradable and on non-tradable goods. Perhaps the sign is better explained by the fact that greater public investment raises productivity and could cause the RER to vary. See section 5 of this article.

tion of the exchange rate band. The impact of an improvement in the terms of trade that has begun to be experienced by the economy is relatively ambiguous: using recent statistics, this trend has apparently tended to lower the equilibrium RER over the past two years.

2.3 Implications of the empirical evidence

From the theoretical and empirical aspects reviewed above, certain lessons can be derived that aid decision-taking on economic policy issues. Before entering into this analysis it should be kept in mind that the studies carried out with quarterly data were made mostly during the 1970s and 1980s, when labor market conditions were very different from those of today, as there was a high level of employment and a centralized mechanism for wage-setting. In contrast, today we face an economic situation that is highly indexed, with conditions of full employment, where demand management might have a different impact on the RER. However, the findings of certain studies using more recent quarterly data and annual data, tend to corroborate the previous results (Repetto, 1992, Elbadawi and Soto, 1994).[11] In this section we will emphasize the most recurrent results.

[11] The point here is that the estimated coefficients can differ over time, so the econometric results need to be interpreted carefully.

TABLE Nº 3 SUMMARY OF EMPIRICAL EVIDENCE FOR CHILE

Studies	Period	Main Conclusions
G. Le Fort (1988)	1974-1982 (Quarterly Data)	Nominal revaluation has permanent effects on the RER if public-sector wages are not completely indexed. If there is perfect wage indexation, the effect may last between 3 and 7 months. Policies aimed at affecting absorption do not have any effect on the RER in the long run.
S. Edwards (1989)	1977-1982 (Quarterly Data)	Capital flows were important in explaining the strong appreciation of the RER in the period. The terms of trade have a negative impact on the RER.
Agosín, Fuentes and Letelier (1994)	1983-1992 (Quarterly data)	Zero long-term impact of fiscal spending on the RER. Net capital flows and terms of trade have a negative effects on the RER in the long run.
Arrau, Quiroz and Chumacero (1992)	1977-1990 (Quarterly data)	Fiscal spending has no impact on the RER in the long run. In the first period it has a negative impact, which is reversed in the third quarter.
A. Repetto (1992)	1960-1990 (Quarterly data)	Fiscal spending has no effect on the RER, whereas the terms of trade and the degree of openness have a positive effect. Once again, capital flows are important in explaining the behavior of the RER.
Elbadawi and Soto (1994)	1960-1992 (Quarterly data)	The terms of trade and public investment tend to raise the equilibrium value of the long- run RER, whereas current public spending and long-term capital only affect it negatively

Although, for lack of data, no study was able to directly incorporate the fiscal deficit as an explanatory variable, it was found that fiscal spending in general tends to slightly appreciate the real exchange rate, but only in the short run: in almost all the studies the long-run effect of this variable on the RER is nil. This fiscal deficit variable may be capturing, on the one hand, the impact of greater spending on the availability of resources for the private sector, and on the other hand, changes in the composition of spending in the economy. Generally it is assumed that fiscal expenditure is intensive in non-tradable goods and services, whereby higher spending tends to raise the price of these goods and cause the RER to fall. An

exception is the study by Elbadawi and Soto (1994) which distinguished between current spending and investment and found a negative impact for the former and a positive impact for the latter on the RER.

In all the episodes analyzed, capital flows have a negative and significant impact on the equilibrium level of the RER, especially long-term capital. This is undoubtedly due to the greater availability of currency, which causes its nominal value to tend to fall and agents to destine a significant part of the extra resources to expenditure on non-tradable goods. In a cross-country study, Edwards (1989) analyses the effects of capital controls on the RER, and finds them to be quite small, which leads one to think that the benefits of capital controls in causing the RER to rise might be relatively small, but they could have a significant negative effect on financing sources for investment. The degree of openness of the economy also proved to be a statistically significant variable. Greater openness, measured in terms of tariff reductions, tends to raise the long-term equilibrium RER. However, this was discovered in studies where the period analyzed included the period when the economy was virtually closed off, as well as the subsequent trade-reform period. In the light of the levels of tariffs existing in Chile today, it is difficult to imagine that a further reduction would have a very significant impact on the RER. However, it might be important for increasing the competitiveness of the economy. In theory, a tariff reduction lowers the price of goods, and so agents tend to replace non-tradables with importable goods, with the consequent impact on the relative price of non-tradables compared with tradables.

As was theoretically to be expected, the terms of trade have an ambiguous impact on the RER. An improvement in the terms of trade cheapens importable goods, and therefore, agents tend to substitute non-tradables with these. But there is also a wealth effect for the country that causes agents to raise expenditure on all goods, including non-tradables. The final result for the RER depends on which effect dominates. On the other hand, the sign of the effect of this variable on the RER will depend on the variables controlled for in the research. But, as has been mentioned already, the terms of trade is not a variable the authority can control; it can only be used for predicting the RER in the future.

3. Exchange rate policy in Chile

3.1 Development of exchange rate policy in Chile

Since the end of the nearly three-year period with a fixed nominal exchange rate, in June 1982, followed by a shorter period of floating,

exchange rate policy in Chile has been characterized by what can be described as managed floating.

The Central Bank determines a central peso-dollar parity (known as the *"acuerdo"* dollar) and a band around it, within which the exchange rate can vary relatively freely.[12]

Although this policy has been maintained essentially unaltered for a long time, it has undergone repeated adjustments. Thus, at one time there were frequent modifications to the indexation rule for calculating the central parity, as CPI variations were considered "excessive" (in 1988 it was modified three times). Subsequently, a real revaluation of up to 4% for 1989 was announced, and this was superseded, in June of that year, by a modification of the assumed international inflation and a widening of the band from 3 to 5 points.

Later, the *"acuerdo"* dollar was revalued by 2% in June 1991, and by a further 5% in January 1992, when the band was also widened to 10 points. In July 1992, a currency basket system was incorporated into the calculation of the central parity, and in November 1994, the *"acuerdo"* dollar was revalued by 10% and the individual weightings in the currency basket were modified (see Table Nº 4).

TABLE Nº 4 MODIFICATIONS TO THE EXCHANGE-RATE RULE

Date	Modification
April 1988	Discount for foreign inflation increased
November 1988	Discount for foreign inflation increased
December 1988	Discount for foreign inflation increased
January-May 1989	Discount for foreign inflation increased by 0.3% per month
June 1989	Discount for foreign inflation modified and band widened from 3 to 5 points
June 1991	Central parity revalued by 2%
January 1992	Central parity revalued by 5% and band widened to 10 points
July 1992	Introduction of the currency basket to the calculation of the central parity
November 1994	10% revaluation of central parity and change in currency basket weightings.

Source: Prepared by the authors.

[12] The Central Bank occasionally intervenes inside the band to avoid very pronounced fluctuations in the exchange rate.

As can be seen, several and frequent modifications have occurred within a basic exchange-rate framework that has been maintained for approximately ten years.

On the other hand exchange controls have been maintained, as an integral part of exchange-rate policy, as well as restrictions on capital movements, especially in the short run.

Without pretending to give an exhaustive list of exchange restrictions that are still in force, but merely illustrate with a few important examples, the following are worth mentioning: the absence of a unified exchange market, obstacles to pension funds and banks investing abroad (discriminatory compared to the alternatives in force domestically), and the 30% special deposit on short-term loans.

3.2 Analysis of the effects of exchange-rate policy

Following the crisis that has recently hit Mexico and Argentina, it has been argued that the key to Chile's success in avoiding a similar crisis has been precisely the maintenance of the special deposit on short-term loans. Although it is true that the special deposit has made it possible, decreasingly, to put a brake on the entry of speculative capital into the country, it also cannot be denied that the systematic maintenance of policies consisting of external openness and liberalization and domestic privatization over a 20-year period,[13] together with an impeccable political transition since 1990, has made it possible to rely on a significant and growing inflow of long-term capital, mainly via foreign investment. In addition, the sharp increase in the domestic rate of saving in recent years has put Chile on a good footing to deal with capital flight.

Thus, the success of the Chilean economy in avoiding a crisis such as occurred in Mexico or Argentina rests not so much on short-term capital restrictions, but rather on its capacity to generate stable and growing long-term capital inflows, and on a high level of domestic saving. At the same time, the peso revaluation analyzed above, explained by these long-term capital inflows (as can be deduced from the analysis of the empirical evidence in point 3), has not translated into a deterioration in the competitive

[13] Probably the most important has been the privatization of social security which has permitted a significant increase in domestic saving, making the country independent of foreign resources for financing investment.

capacity of national exports, which, on the contrary, have maintained their dynamism (see Table Nº1) and become increasingly diversified.

It could be argued that an alternative solution to the special deposit is to abolish it and lower the short-term interest rate to levels compatible with international rates. However, unless one is willing to argue that the interest-rate elasticity of spending is close to zero, and/or that public spending can be reduced sufficiently to avoid generating inflationary pressures, this alternative is not feasible to put into practice. It therefore becomes necessary to review the mix of fiscal and monetary policies.

For all these reasons, barriers to capital entry have been imposed mainly on short-term capital flows, yet, as mentioned above, the most important component of capital flows is long term.

Alternatively, it has been argued that what is needed are further restrictions on capital movements, and this has led to extending the coverage of the special deposit on short-term capital and secondary ADR issues.[14] Although from a practical and concrete point of view, increasing restrictions could lead, at least in the short run, to restricting capital flows and devaluing the peso, to justify this it needs to be shown that the international financial market has significant imperfections or, at least, that the massive external financing that has come into the country is "transitory".[15]

It seems somewhat dangerous to impose restrictions on other long-term capital as these are an important source of investment. On the other hand, and despite the crisis in other Latin American economies, there is nothing to suggest that such capital will not continue to arrive in the coming years. Furthermore, greater obstacles to capital entry would generate a climate of mistrust among foreign investors, which would be negative for the future growth of the country. Arguing along the same lines, it has been suggested that foreign investment should be accepted on a selective basis, and specifically the possibility of restricting investment in mining (or at least in copper) has been put forward. This proposal, which does not stand up to the slightest analysis, has a high cost (the present value of expected flows from these investments) and implies a generalized open ended subsi-

[14] Evidently this measure does not make much sense, at least momentarily, as a result of the Mexican and Argentine crises. In the first months of 1995 a flowback phenomenon seems to have been produced, i.e. the reconversion of ADRs into shares, with a consequent flow of dollars abroad.

[15] It is difficult to understand, on the other hand, how capital flow can be sharply and appreciably altered, or reversed, without a domestic cause provoking this. In other words, the responsibility for a loss of a capital financing has to be sought in a mistaken management of domestic economic policy rather than in external factors.

dy to multiple and dissimilar activities (including copper producers already operating). An old adage of economic policy says that to achieve a given end one should use the most direct means, since this is what produces the least social cost.

Thus, if there are any sectors which are identified politically as needing subsidies, this should be done directly without interfering with the development of other activities. If such subsidies are unacceptable in framework of the World Trade Organization, then an attempt should be made to reduce adjustment costs in these activities. In any case, it has not been shown that investment in copper is the "guilty party" in peso revaluation, and it is surely not the only cause.

Arguments so opposed to one another as those summarized in the previous paragraphs do, nevertheless, have a common origin: the conviction that for one reason or another, the flows that have been coming into the country are fundamentally unsustainable, and so the revaluation of the peso documented above has exceeded what could be classified as normal or reasonable.

Furthermore, the argument of imposing restrictions on short-term capital due to their high volatility has been called into question recently by Claessens, Dooley and Warner (1995). In a time-series study of capital flows, covering five developed and five developing countries, they found that the terms "short run" and "long run" do not provide any information regarding the time-series properties of such capital flows: long-term flows are often just as volatile and unpredictable as short-term flows. Moreover, knowledge of the breakdown between these two types of capital does not improve prediction of the overall capital account. These results provide evidence to think that the justification for restricting short-term capital, in terms of its being likely to be more volatile, is weak, to say the least.

However, there has been a lot of speculation on the importance of short-term capital flows for the downward trend seen in the real exchange rate in recent years, as well as regarding the efficiency of the special deposit in limiting the inflow of short-term credits into the country. Although we will not pronounce on this latter point, as it constitutes a relevant research topic in itself, it is possible to state that short-term flows in recent years have not been particularly high, and so they do not explain the strong revaluation of the peso.

Table Nº 5 provides information on short-term capital flows in recent years, in absolute terms and as a proportion of GDP, exports and the capital account.

TABLE Nº 5 SHORT-TERM CAPITAL FLOWS 1987-94
(AVERAGES IN US$ MILLIONS)

	1987-89	1990-94
Short run	947	1,244
Short run - Public sector	877	1,340
Private and banking sector credit lines and direct trade credit	400	655
Short run /GDP	3.9	3.1
Short run - public sector/GDP	3.6	3.5
Credit lines + Direct trade credit./GDP	1.5	1.7
Short run /exports	14.0	13.0
Short run - Public sector/ exports	13 1	14.1
Credit lines + Direct trade credit / exports	5.3	6.9
Short run / Capital excluding reserves	86.2	48.1
Short run - Public sector / Capital excluding reserves	80.5	62.1
Credit lines + direct trade credit/ Capital excluding reserves	33.8	21.5

Source: Central Bank of Chile and authors' own estimates.

The items including in Table Nº 5 start with total net short-term capital flows, and in the second row capital movements corresponding to the non-financial public sector have been deducted,[16] as behavior here is probably not explained by the same factors as in the private sector. The third row gives the sum of direct commercial credits and credit lines to the private and banking sector, which are probably most directly associated with speculative factors.

From the data in Table Nº 5, it can be deduced that short-term flows have not varied significantly compared with the control period of 1987-89,[17] when the real exchange rate remained high. This becomes clearer still if one considers the magnitude of the flows compared with total foreign financing obtained in the years under analysis.

Indeed, the importance of short-term capital flows in the capital account balance, under any of the definitions considered, is less in the period 1990-94 than in 1987-89.

[16] Specifically in 1991 the public sector openly acted with the aim of counteracting capital flows, reducing its short-term borrowing by US$600 million. Additionally, the medium- and long-term debt of the non-financial public sector was cut by US$ 665 million between 1993 and 1994.

[17] As a control or reference period, we take the period between 1987-89, as this is a period of high and stable real exchange rate, when, to some extent, the lack of access to voluntary foreign financing caused by the debt crises had been overcome.

As regards the proposal to open the capital account to reverse the peso appreciation and so facilitate capital outflows, it should be kept in mind that there are more restrictions on capital entry than on exit. For this reason, although it would help to alleviate downward pressures on the exchange rate, such opening up would likely have a marginal effect. However, it needs to be stressed that a more open capital account is a good measure for reasons other than its possible exchange-rate impact. One of the basic arguments in support of open an capital account, is that it acts as a "constraint mechanism" forcing the economic authorities to maintain consistency in macroeconomic policy. Furthermore, the fact of maintaining a consistent and credible policy over a long period, as Chile has done, lends support to the idea that greater financial openness would be healthy, as it would allow access to cheaper financing, greater risk diversification and an enhanced international image, while also exploiting comparative advantages in financial intermediation in the region, etc.

Another element that has been stressed in the discussion on policies to sustain the exchange rate, is unilateral tariff reduction. The empirical evidence, outlined in Section 2, shows that greater commercial openness tends to raise the real exchange rate, which would support the idea of lowering tariffs. However, the time periods used in the empirical studies include the drastic trade reform undertaken by Chile in the 1970s, which favored a high real exchange rate. Due to the relatively low level of tariffs existing today in Chile, the effects of further tariff reduction on the RER, of four percentage points for example, would likely be small.[18] Moreover, with the signing of various trade agreements that are in the pipeline, in the long run these internal barriers to trade will tend to disappear. However, the long run may be very long, and a small country like Chile needs to assess whether it is worthwhile maintaining trade restrictions with countries it does not sign trade agreements with.

Another line of argument that can be used to explain the persistent strength of the peso relates to the Central Bank's systematic attempt to avoid or attenuate the revaluation of the peso since 1990. These efforts by

[18] Given the current level of tariffs, even their abolition would not have very appreciable effects on the exchange rate, but probably would have a clear negative effect on import substituting activities.

the Bank have translated into a considerable accumulation of reserves which, if it continues at a similar rate, could turn the country from a debtor to net creditor nation at the international level in a few years. The maintenance of a level of reserves that is clearly excessive,[19] and which has a high opportunity cost despite being a stock rather than a flow, affects the exchange rate via the country-risk element, which clearly modifies capital flows, and through its potential impact on the supply of foreign currency in the exchange market.

In addition to this, Central Bank intervention, whose magnitude is evident in the accumulation of reserves mentioned above, has slowed down the convergence between the market real exchange rate and the equilibrium rate, so it is reasonable to think that this trend has not yet been halted.

The adverse external scenario Chile has faced since 1990, with the terms of trade turning down and modest growth in the world economy, is also an argument in favor of continuing the process of peso revaluation, as it has been occurring in an adverse context. And as the terms of trade improve and growth picks up, it is reasonable to expect a significant stimulus to the development of the export sector, as in fact was seen in 1994 and is happening in 1995, offsetting the negative affects of peso revaluation in the short run, but accentuating the trend in the medium term.

Finally, one should also not ignore the fact that the dollar has depreciated sharply on international markets during the last two years, thereby contributing to the process of peso revaluation. The behavior of the central parity or *"acuerdo"* dollar, especially since the beginning of 1994, which approximates to the concept of a constant real exchange rate, is a clear reflection of the effect of dollar weakness on the strengthening of the peso. Table Nº 6 shows the trend of the central peso-dollar parity, as well as that of the exchange rate between the peso and the German mark, on one hand, and the peso and the Japanese yen on the other. (See also Graph Nº 2 in this regard).

[19] There are no theoretical elements which enable one to define the optimum level of reserves, but empirical evidence shows that developed countries maintain no more than three months' worth of imports in reserves, and that the average in developing countries does not exceed six months. There are few countries, like Chile, which have more than one year of imports held in reserves.

TABLE Nº 6 ACUERDO DOLLAR AND PESO/MARK, PESO/YEN EXCHANGE RATES (MONTHLY AND YEARLY AVERAGES)

	"Acuerdo" Dollar (central parity)	Change	Peso/ Marco	Change	Peso/ Yen	Change
1990			189.51		2.12	
1991			211.30	11.5	2.60	22.7
1992	398.29 (1)		233.27	10.4	2.87	10.4
1993	430.01	8.0	244.89	5.0	3.65	27.2
1994	454.79	5.8	259.46	6.0	4.12	12.7
January 1994	464.35	9.3	247.24	3.9	3.86	25.6
February	459.76	8.5	247.00	4.3	4.03	25.6
March	458.09	8.7	254.36	5.4	4.10	20.6
April	458.34	10.5	250.28	-0.5	4.11	15.0
May	459.07	10.2	256.55	1.6	4.10	11.7
June	458.28	8.6	257.88	5.2	4.09	8.9
July	453.04	5.1	268.19	13.4	4.28	13.8
August	456.04	6.5	268.29	11.6	4.21	6.9
September	455.97	6.3	267.97	6.4	4.20	8.3
October	456.22	4.0	270.98	7.5	4.19	8.5
November	457.19	1.6	268.80	10.6	4.22	10.2
December (2)	463.24	0.6	256.02	2.5	4.02	3.5
January 1995	460.59	-0.8	264.99	7.2	4.07	5.5
February	456.81	-0.6	274.32	11.1	4.07	4.2
March	440.19	-3.9	291.52	14.6	4.20	10.4
April	429.73	-6.2	285.89	14.2	4.71	14.7
May	436.38	-4.9	267.81	4.4	4.43	8.0
June	436.35	-4.8	267.51	3.7	4.41	7.7
July	440.92	-2.7	272.65	1.7	4.35	1.6

(1) This figure only covers the July -December average, which is when the currency basket was incorporated into the central parity calculation.

(2) The effect of the *"acuerdo"* dollar revaluation at the end of November has been eliminated, so as to reflect exclusively the effect of the differential inflation and parities on the currency basket.

Source: Central Bank of Chile and authors' own calculations.

To summarize, the fundamental causes of the current exchange rate appreciation have to be sought in variations in external variables such as the terms of trade (during this past year) and long-term capital flows. The different economic policy measures that have been suggested recently to palliate this exchange rate appreciation, appear to be somewhat ineffective in achieving their objectives. On the other hand, more drastic measures have involved relatively high costs in terms of credibility and macroeconomic consistency. But the question of what the Chilean economy can do to

defend itself from a real appreciation of its currency is still unanswered. We will attempt to give an answer to this question in the following subsection.

FIGURE 2 EXCHANGE RATE: PESO-MARK AND PESO-YEN

<<insert figure 2>>

3.3 Some reflections on *Dutch disease*

The phenomenon of *Dutch disease* relates to a situation in which the development of a given activity or sector, which is manifestly more profitable and productive than those already existing in the country, can lead to a sharp contraction and even disappearance of many of the latter activities, thereby generating significant adjustment problems (unemployment, obsolescence of human capital, etc.).

In the particular case of Chile, the hypothesis has recently been developed whereby the expansion of copper production up to the end of the century, involving a doubling of current production, will probably provoke a *Dutch disease* phenomenon from on now due to the investments that are being undertaken, and later due to the effect of greater production on exports. In this regard, we should stress that we are talking about growth of about 15 per cent per year —a similar figure to the growth of non-traditional exports in recent years. If we assume, for a moment, that the price of copper stays at this year's level (around US$1.28 per pound), this will represent an exported value of copper of some US$ 12,000 million in the year 2000 (assuming a doubling of current output). If, on the other hand, non-copper exports grow (in value) at an average rate of 5% per year (a figure which seems very conservative), they would amount to about US$11,700 million by the year 2000. This would mean that the share of copper in total exports would rise from 40% this year to 51% in the year 2000.

Under these assumptions, highly favorable to the *Dutch disease* hypothesis, the expansion of copper production has a relative small impact. If on

the other hand, one assumes a more normal copper price (US$1 per pound, for example), the export value would amount to about US$ 9,200 million in the year 2000, representing 44% of total exports, under the same assumptions regarding non-copper exports.

These figures suggest that it is difficult to envisage a *Dutch disease* phenomenon occurring in the Chilean economy as a result of higher copper output, comparable to that associated with the rise in the price of natural gas on the Dutch economy, or, to a lesser extent, the tripling of the oil price in 1973-74 on Norway and Great Britain.

Furthermore, even if we assume that it is potentially possible for a shock to happen in the rest of the economy which could be characterized as *Dutch disease*, the advantage we would have over the countries that faced the original phenomenon is that this shock is well understood, thus allowing us to adjust.

It seems clear to us that the potential importance of this issue, like many others, has been exaggerated, and has diverted attention away from what is really essential: the need to adjust to a reality determined by a persistently lower real exchange rate.

3.4 What to do with exchange rate policy?

It seems clear from the discussion in the previous points, that greater or lesser openness of the capital account has little to do with downward trend in the exchange rate. It also seems clear that a different mix of policies would be desirable, allowing the short-term interest rate to move down so as to reduce or eliminate the special deposit. However, notwithstanding the importance of this aspect of macroeconomic management, it is worth reiterating that it has little to do with the systematic revaluation of the peso over recent years.

On the other hand, the goal of bringing inflation down to near-zero levels limits the possibilities of implementing an expansionary policy that would generate a bigger deficit in the current account and a smaller surplus in a overall balance, thereby reducing the excess supply of currency and the revaluation of the peso.[20]

[20] Our historical experience, as well as recent cases of Argentina and Mexico, advises us to be cautious with this type of policy, due to the vulnerability it generates in the face of minor changes in the external scenario.

In the context described above, the management of exchange rate policy by the Central Bank should aim at avoiding, or at least reducing, losses associated with managing the dollar parity.

This means that the Bank should not participate in the foreign exchange market with any given bias; i.e. it should avoid buying dollars systematically and permanently, as it has been doing since 1990, and thus put a stop to the losses such operations have incurred.

For the above, the floatation band around a central parity needs to be abolished (as well as the *"acuerdo"* dollar itself) and replaced by a flexible exchange rate with just sporadic interventions to attenuate excessive fluctuations.

As there is no concrete evidence regarding the equilibrium level of the real exchange rate, any policy to sustain the exchange rate could be extremely costly (as in fact it has been).

Through such a measure the Central Bank would also regain a significant part of its control over the money supply, which it gives up whenever the value of the exchange rate reaches the floor or the ceiling of the band.

4. Elements of a proposal

In the first place, it needs to be pointed out as a corollary the issues discussed above, that the downward movement of the RER is an equilibrium movement[21] rather than a short-term misalignment. As has been argued above, this statement is based on the capacity of the Chilean economy to attract stable capital flows increasingly over time, supported by a current account balance that is perfectly sustainable over time, and which for 1995 is expected to be zero or even positive.

In addition, and despite the real appreciation of the peso, the dynamism of the export sector has not been lost (see Section 1). In fact Chilean export growth in 1995 is expected to be even greater than before. The relevant question is what to do to maintain and increase the competitiveness of the Chilean economy. The central issue for enhancing a country's competitiveness is productivity increase, something that not yet been analyzed in this study, but which is also one of the theoretical foundations of the RER.

[21] In other words the direction in which the exchange rate has been moving over the recent years is consistent with equilibrium.

Since the most important issue is to maintain an economy that is competitive at the international level, public opinion worries about the trend of the RER, but as Porter (1990) has pointed out, the central element of competitiveness at the national level relates to productivity. Productivity means lowering production costs so as to reach international markets at more competitive prices.

Productivity increases at the national level have their origin both within firms, depending on decisions taken by the private sector, as well as on the environment around them, which depends on the aggregate actions of firms and the State.

When one thinks of productivity there are two elements that come to mind immediately: productive efficiency and technological progress. The first relates both to improvement of entrepreneurial capacity and a reduction in the internal inefficiency of firms, as well as the development of an institutional environment and the quality of services which are complementary to firms. The latter has to do with greater investment in infrastructure, improvements in the management of ports and highways and efficiency increases in the public sector.

As regards greater investment, this is a policy element which is in the hands of the economic authorities, who either undertake investment projects directly or else award franchises to the private sector. The latter has been happening, but there is still much to do: public investment is definitely a bottleneck for the development of different export sectors. As regards the management of infrastructure itself, in the ports for example, improvements are needed in the quality of service and administration. For this one can also resort to franchising to the private sector, which would help to improve administration, and thus efficiency of use.

As regards improvements in entrepreneurial capacity and the reduction of productive inefficiencies, these are achieved by the very competition that firms have to face. The best proof of that is that, the despite the fall in the exchange rate, the dynamism of the export sector has been maintained.

As regards technological process, there are two concepts associated with this: namely, innovation and the imitation and adoption of new technologies. Given the stage of development in which the country finds itself, the latter alternative seems more plausible. It is worth pointing out that the activities mentioned mostly tend to happen through firms' initiatives in importing new capital goods which come with technological progress built into them, as well as through investment in research and development for the imitation and adoption of new technologies, etc., rather than due to the effects of state policy.

However, a fundamental factor for adopting new technology is human capital, and improving the Chilean educational system is becoming increasingly necessary, so as to make it possible to raise training levels in firms. The big policy challenge is firstly to identify the most profitable way of investing resources in the education sector —i.e. what are the most effective policies— and then proceed to implement them. Without doubt the main investment efforts need to be undertaken at the pre-primary and primary levels, so as to prepare those who will constitute the labor force of the future. In addition, a rethink of incentives for training at the firm level, and augmenting the resources destined to this, could be highly profitable.

All actions aimed at increasing productivity which depend on decisions by firms will be undertaken as firms face stronger external competition together with a stable institutional and microeconomic climate. In this sense, one can predict that the real appreciation of the peso has led, and will continue to lead to firms becoming more efficient and being concerned about improving their technology. An example of this is what has happened with Japan due to the real appreciation of the yen. The real exchange rate at which exporters expect to cover their costs has been falling at the same rate as the real observed exchange rate, with the result that exporting firms have come to be among the most efficient in the world, or else have simply adopted a strategy of setting up in neighboring countries (see *The Economist*, 1995).

Within the institutional environment, other important variables for increasing the competitiveness of the economy relate to the flexibility of factor markets, especially the labor market. Given that a fall in the exchange rate will be accompanied by a productive restructuring in many sectors, the labor market needs to have enough flexibility to permit an expeditious reallocation of resources. For example, if norms are set which rigidify the hiring or firing of new workers, they will tend to diminish the capacity of firms to adapt to structural changes in the economy.

Still in the context of enhancing competitiveness, there is no doubt that gradual tariff reductions will make it possible to guide the economy in the correct direction. As well as this, adapting tax policy to the new conditions the country is living through would also point in the same direction. For example, the current structure and levels of income tax need to be rethought, as well as the taxation of companies based on accrued rather than distributed profits, etc. Such measures would make it possible to free resources that are currently employed in trying to take advantage of tax breaks that are only available for certain groups of people and which hamper the competitiveness of the economy.

Finally, a more fundamental question needs to be addressed. Accepting that the fall in the RER is an equilibrium phenomenon, should it be allowed to fall freely or should the authorities take measures to graduate the fall? If the answer is that the decline should be made gradual, so as to allow exporters and import-substituting sectors to defend themselves against it, the question then is: what can be done?

In answering this, we believe that certain conditions need to be established. In the first place, it should be keep in mind that imposing greater restrictions on capital movements, or any other distortions on investment, implies significant costs (which have been mentioned in this paper) without resolving the underlying problem. In the second place, it should be pointed out that encouraging capital outflows could have more permanent effects on the RER. What has so far been done timidly with the AFPs and the banking sector, has not provoked a significant currency outflow, and probably will not do so. Perhaps more aggressive strategies of signals in this direction might be useful.

However, all the alternatives that have been put forward are somewhat naive, with effects only in the short run, if at all. Lending reserves to countries in difficulties (with IMF support), generating forced saving in foreign currency, and other options of the same type, apart from generating further distortions and noise, will only have a transitory impact on the exchange rate. The only permanent thing to do is to generate a deficit on the current account to absorb the excess supply of foreign currency, and the only way to do this is through higher imports, which in turn, requires higher domestic spending; but this clashes with the problem of inflation. Apparently, the excess of foreign currency is greater than what the country can absorb in the short run. From the above it can be deduced that the only realistic thing is to deal with peso revaluation with greater efficiency, necessarily implying contraction and, in some cases, disappearance of certain activities.

5. Summary and conclusions

This paper has analyzed the evolution of the real exchange rate under different definitions. All of them show that there has been a systematic real appreciation of the peso from 1990 onwards when the dollar price peaked; this phenomenon, however, has not diminished the rate of growth of exports. One of the reasons for this can be found in the fact that the peso has not strengthened with respect to other currencies such as the mark or the yen.

Subsequently, the theoretical foundations of the determinants of the real exchange rate were examined, as well as studies of empirical evidence for Chile. The latter had interesting findings in common, such as that the management of aggregate demand (Le Fort, 1988) and government spending (Arrau et al. 1992, and Agosín *et al* .1994), do not have a statistical impact on the exchange rate, whereas long-term capital flows and the degree of openness do have a statistically measurable effect. Other variables, such as the terms of trade, turn out to have an ambiguous result, sometimes positive and other times negative, depending on the period of analysis and on the variables that are controlled for.

These results in general tend to confirm theoretical predictions. Their main implication is that the real appreciation of the peso over recent years is basically due to external and permanent factors, and if one compares with other periods, when different external conditions prevailed, one can state that the current movement of the exchange rate is an equilibrium phenomenon. There is even sufficient evidence to think that the equilibrium level could be lower still. As well as the inflow of capital over recent years, there has been a sharp improvement in the terms of trade in 1994, which has also contributed to the fall in the exchange rate. However, this could be reversed in the long run as the economy increases its imports in response to the implied increase in real income.

To face exchange rate appreciation, different policy measures are discussed in Section 2 which have the objective of softening the fall. Without doubt the most important discussion has taken place in terms of what to do with capital flows, as there seems to be a consensus that the fall in the real exchange rate is due to external factors. Where consensus apparently does not exist, is in whether the changes are permanent or not, and this has led to policy measures being suggested that are quite contradictory. One line of argument is based on the need to maintain or even increase restrictions on capital entry. This implicitly carries with it the assumption that capital inflow is a transitory phenomenon. In addition, restrictions so far have been imposed on short-term capital, based fundamentally on the idea that these tend to be more volatile than the other components of the capital account.

On this issue there are two important points that need to be considered. In the first place, short-term capital in the period 1990-1994 has had the same relative importance as in the period 1989-1989, when measured as a proportion of exports or GDP, and has diminished its importance when compared as a proportion of the capital account excluding reserves. This leads one to think that it is long-term capital that has been relatively more

important in explaining the current appreciation of the peso.[22] A second point is based on the idea that short-term capital is not necessarily more volatile or of a more transitory nature than long-term capital. Evidence of this is to be found in the paper by Claessens *et al.* (1995), which studies a group of ten countries. It therefore seems somewhat inadvisable to follow this line of policy action, as the diagnosis points to the presumption that it is not short-term capital that has been the main cause of the appreciation.

Another position that has been argued is in favor of greater capital account openness, so as to permit outflows and put upward pressure on the exchange rate. In this regard, there is the counterargument that when countries liberate capital outflows, it usually produces an inflow of capital towards the country in the short run (see for example, Williamson, 1992). Yet, those who hold this position speak of expanding the investment possibilities for pension funds, banks and insurance companies. This would likely have some short-run impact on the exchange rate, but in the long run the flow will tend to reverse itself when such investments produce dividends, so the long-run effect would seem to be of little significance.

Other measures to strengthen the real exchange rate, such as fiscal management, will tend to exert a relatively small impact in the short run and a zero impact in the long run. On the other hand, a reduction in the domestic interest rate could diminish exchange rate pressures and reduce the costs to firms (greater competitiveness), but it has the inconvenience of leading to a relatively dangerous expansion in spending, which would affect inflation and the long-term competitiveness of the economy. Such measures seem somewhat unlikely to be applied with any success.

From this paper the following conclusions can be drawn:

Firstly, without denying its importance, macroeconomic management has had little to do with the systematic revaluation of the peso in recent years, the basic causes of which are the high level of capital flows into the country and rising terms of the trade over the past year. Secondly, as regards what to do with exchange rate policy, it seems time to evaluate the alternative of eliminating the floatation band, and for the Central Bank to make transactions in the exchange market without explicitly committing itself as to what the level of exchange rate ought to be. Any other alternative of greater intervention by the Central Bank seems to be highly costly. An additional benefit of this measure is that the authorities would regain at|‰onomy over monetary policy management.

[22] It should not be denied, on the other hand, that the current account has improved in recent years, especially as regards the financial and non-financial services components.

As there does not seem to be a clear way out as regards sustaining the real exchange rate, this paper proposes dealing with the underlying issue of the competitiveness of the Chilean economy, of which the real exchange rate is just one of the elements.

As a third conclusion, it is stressed that, in the medium and long term, the relevant issue is to raise national competitiveness via productivity increases, greater openness, a shrinking and simplification of the tax structure and greater flexibility in factor markets, all of which would allow the restructuring of different productive sectors with the current trend in the exchange rate being maintained. Although productivity is an element which is developed at the firm level, in the long run the State can contribute through improvements in the formal education system, greater coverage and better targeting in the national training and employment program (SENCE), increases in investment and improvements in the management of highway and port infrastructure, via its transfer to the private sector.

BIBLIOGRAPHY

Agosín, M., Fuentes, R. and Letelier, L. (1994). "Los capitales extranjeros en las economías latinoamericanas: El caso chileno" in J. A. Ocampo (editor), *Los capitales extranjeros en las economías latinoamericanas.* Fedesarrollo and Interamerican Development Bank, pp. 103-148.

Arrau, P., Quiroz, J. and Chumacero, R. (1992). "Ahorro fiscal y tipo de cambio real". *Cuadernos de Economía*, 29, pp. 349-386.

Claessens, S., Dooley, M. and Warner, A. (1995). "Portfolio Capital Flows: Hot or Cold". *The World Bank Economic Review, Vol.* 9, N° 1, pp. 153-174.

Edwards, S. (1989). *Real Exchange Rates, Devaluation, and Adjustment.* Cambridge-Massachusetts: The MIT Press

_____ (1989). "Exchange Rate Misalignment in Developing Countries". *World Bank Occasional Paper N° 2*, Johns Hopkins University.

Elbadawi, I. and Soto, R. (1994). "Capital Flows and Long-term Equilibrium Real Exchange Rates in Chile". *Unpublished manuscript*.

Le Fort, G. (1988). "The Relative Price of Nontraded Goods, Absorption, and Exchange Rate Policy in Chile". IMF *Staff Papers*, 35, 2 pp. 336-370.

Porter, M. (1990). *The Competitive Advantage of Nations.* London: The MacMillan Press Ltd.

Repetto, A. (1992). "Deterrninantes de largo plazo del tipo de cambio real: Aplicación al caso chileno (1960-90)". *Colección Estudios Cieplan*, 36, pp. 67-98.

The Economist (1995). "The shock of the yen", April, pp. 33-34.

Williamson, J. (1992). "Acerca de la liberalización de la cuenta de capitales". *Estudios de Economía, Vol.* 19, N° 2. □