

Banco Central de Chile
Documentos de Trabajo

Central Bank of Chile
Working Papers

N° 68

Marzo 2000

**CHILE'S PESO:
BETTER THAN (JUST) LIVING WITH THE
DOLLAR?**

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Documentos de Trabajo del Banco Central de Chile
Working Papers of the Central Bank of Chile
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CHILE'S PESO: BETTER THAN (JUST) LIVING WITH THE DOLLAR?

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Resumen

La decisión entre mantener o sacrificar la moneda nacional está influida por la comparación de los beneficios de la flexibilidad macroeconómica derivada de un sistema de cambio flotante y una política monetaria independiente, con los costos microeconómicos derivados de una unión monetaria o adopción unilateral de una moneda extranjera. Este trabajo analiza esta decisión para el caso chileno. El desarrollo financiero del país y su estabilidad macroeconómica implica incurrir en bajos costos microeconómicos y de eficiencia al mantenerse el peso. La revisión de los criterios de área monetaria óptima muestra que Chile no es un candidato natural para integrar una unión monetaria con potenciales socios en América Latina, NAFTA o la Unión Europea. La dolarización unilateral es aún menos beneficiosa. Para un país que, como Chile, está sujeto a intensos shocks idiosincráticos y a significativas rigides tranistorias de precios y salarios, un tipo de cambio flexible y una política monetaria independiente anclada a una meta de inflación constituyen una opción de régimen que domina a las demás.

Abstract

The choice between maintaining or giving up the national currency is determined by putting on balance the benefits of macroeconomic flexibility derived from a floating exchange rate and an independent monetary policy, and the microeconomic benefits derived from joining a currency union or adopting unilaterally a foreign currency. This paper assesses this choice for Chile. The country's financial development and macroeconomic stability imply low microeconomic and efficiency costs in sticking to the peso. An evaluation of optimal currency-area criteria shows that Chile is not a natural candidate for joining a monetary union with prospective partners in Latin America, NAFTA, or the European Union. Unilateral dollarization is even less beneficial. Among Southern Hemisphere countries with various exchange rate regimes, Chile would gain the least from giving up its national currency. For a country like Chile, subject to large idiosyncratic shocks and significant temporary price and wage rigidity, a flexible exchange rate and an independent monetary policy anchored to an inflation target comprise the dominant regime choice.

The authors have benefited from excellent discussions with and comments from Jorge Marshall, Patricio Meller, Raimundo Soto, and Daniel Tapia, as well as participants at the Conference on the Future of National Currencies (Catholic University of Chile), January 2000. They also thank Matías Tapia for outstanding research assistance. The views and positions presented in this paper are strictly those of its authors and do not reflect those of the Central Bank of Chile or its Board members. Email: fmorande@condor.bcentral.cl, kschmidt@condor.bcentral.cl.

I. INTRODUCTION

The start of the third millenium marks a new milestone in Chile's monetary and exchange-rate regime. A quarter century after initiating in 1974 the world's most gradualist anti-inflation program, Chile's endemic inflation has finally been defeated. Price stabilization has been attained in the sense of reaching inflation levels that are slightly above industrial-country levels and consistent with the Central Bank's medium-term inflation target range of 2-4% per year. This achievement tops a decade of successful application of a monetary framework based on inflation targeting by a Central Bank that gained statutory and factual independence in late 1989.

More recently – in September 1999 – the Central Bank adopted a floating exchange rate regime, suspending the preceding crawling exchange-rate band system that had been in place since 1985. Abandoning the exchange rate band avoids incurring in policy inconsistencies that arise whenever a conflict emerges between the inflation target and the exchange rate objective implicit in the band. A floating exchange rate regime coupled to a monetary framework based on explicit inflation targeting provides the required policy consistency. Certainly Chile is not alone in realizing this and acting accordingly. An explosive number of industrial, transition, and developing countries have recently adopted or are in the process of starting currency floats cum inflation targeting.¹

Yet it is both relevant and timely to question this selection of monetary/exchange rate regime for Chile. This country – like most others in the world today – faces two basic choices in this regard. One alternative is to maintain and strengthen the current monetary/exchange rate regime based on floating and inflation targeting, hence sticking to the Chilean peso. The main alternative to this choice is to give up the national currency, either by adopting unilaterally another country's currency ("dollarization") or by adopting multilaterally a common currency with other countries (monetary union). A third alternative – sticking to the peso and adopting some variant of inflexible exchange rate regime that could range from a currency board to a broad exchange rate band – is neither relevant nor popular anymore. Recent world economic history has been unkind to countries pursuing inflexible regimes, and Chile has certainly not been an exception to this experience.

The choice between maintaining or giving up a national currency is determined by putting on balance the macroeconomic benefits derived from macro flexibility under a floating exchange rate system and an independent monetary policy and the microeconomic benefits derived from lower transaction costs and improved economic integration under a currency union. However a precise quantitative evaluation of the latter costs and benefits is not easy to undertake. First it is hard to draw up a clear-cut counterfactual scenario that isolates regime choice (say, a currency union) from other policy choices (say, fiscal, trade, and financial reform). Second, there is disagreement about the empirical magnitudes involved. In addition, political factors and cost/benefit analysis are as important as purely economic factors in selecting an exchange rate/monetary regime. Monetary union is

¹ A comparative review of inflation targeting experiences in the 1990s, with some focus on Chile's experience, is found in Landerretche, Morandé and Schmidt-Hebbel (2000).

typically part of a much larger international agreement that involves economic integration and advanced stages of political agreement or union, as exemplified by European Monetary Union (EMU).

Aware of the above mentioned methodological limitations that surround this issue, this paper reviews and evaluates the two basic regime choices for the case of Chile. From the available evidence the main conclusion is that Chile is better off with the peso than by adopting either the dollar or a common currency shared by potential partners. Dollarization or monetary union in the near future would impose more costs than benefits.

The paper is organized as follows. Section II reviews arguments and evidence provided by the literature on the choice of exchange rate / monetary regimes. Section III evaluates this choice for Chile in the context of Chile's and its prospective partner's recent experience and current structural features. Section IV concludes and discusses policy implications.

II. CHOICE OF EXCHANGE RATE / MONETARY REGIMES: THE ARGUMENTS AND THE EVIDENCE

When Milton Friedman agitated the flag of the floating exchange rate camp back in the early 1950s, at the heights of the Bretton Woods era, academics and policy makers agonized over whether the nominal value of the national currency should be pegged to the US dollar or allowed to be set by the market. But nobody was seriously considering giving up the national currency. In the following decades, the debate moved toward considering the benefits of hybrid systems, which naturally involved maintaining the national currency. Not too long ago, a survey of the theoretical literature concluded: "Neither of the extremes of permanently fixed or completely flexible exchange rates is optimal in seeking macroeconomic stability. Instead, some intermediate degree of flexibility is more likely to succeed in stabilizing the economy in response to random shocks" (Aghevli, Khan, and Montiel 1991). What these authors had in mind, like many others at that time or before (Frenkel and Aizenman, 1982, Fukuda, 1992), was that macroeconomic stability was not simply price stability but rather a broader concept referring to a smooth business cycle. According to this view, having an extra policy instrument such as an adjustable exchange rate was beneficial because there were too many objectives to be chased.

This view has been subsequently revised in light of new developments in the 1990s that have helped in refocusing the issues. First, globalization of capital markets has occurred, reflected in a massive increase in capital flows toward emerging economies and subsequent contagion and capital flow reversal in the aftermath of the Asian crisis. Financial globalization challenges the conventional assumption that national moneys are only demanded by people of the corresponding country. Competition of securities issued in different currencies, directly or through financial derivatives, is taking place at an unprecedented scale. Policy makers can do little to protect national currencies from competition of other monies in global investor portfolios by appealing to capital controls or exchange restrictions. As a result, hybrid systems are easier to attack and the national governments are less powerful to defend them. Hence, it becomes increasingly difficult to

use the exchange rate as a policy instrument to achieve macroeconomic stability. Furthermore, in a financially integrated environment, hybrid systems may also be inefficient since markets will have difficulties in assessing the exchange rate risk as authorities have discretionary powers to intervene in exchange rate markets.

The second development has been the successful implementation of the Maastricht agreement and the start of European monetary union (EMU). The adoption of the Euro by (initially) 11 member countries in January 1999 has reignited the 1960s debate on the merits and drawbacks of currency unions (more popular in the 1960s), that is, the cost-benefit analysis about giving up the national currency in favor of a regional money. As a third and (up to now) region-specific development, a debate is going on in Latin America about a particular way of sacrificing the national currency, i.e., by unilaterally adopting another country's currency. "Dollarization" is a regime option, which Ecuador is currently trying to adopt and Argentina, as well as some Central American countries are considering.

Therefore today's debate is moving away from whether to peg or to float the currency and towards whether to have a national currency whose value is determined by the market or to replace it by another country's money or a regional supranational currency. The international evidence regarding exchange rate regimes reflects this. Figure 1 depicts the world's country distribution by degree of exchange regime flexibility for four years: 1976, 1986, 1998, and 1999. The mostly U-shaped curves show that intermediate regimes of limited flexibility have not been popular during the last quarter century. Regimes of limited exchange rate flexibility and of exchange rates adjusted by specific indicators are not more frequent than in 10% of all countries. Moreover, a major trend shift toward more flexible systems took place until 1998. Pegged regimes (comprising currency unions, currency boards, and fixed exchange rates) dropped precipitously, from 86% of countries in 1976 (i.e., already well after the collapse of the Bretton Woods era of US\$ pegs) to 35% in 1998. Free floats increased during the same period from 1% to 25% of countries. However since the start of EMU one year ago, the number of countries with pegs (including those with currency unions) raised again, to 48%, at the expense of regimes of intermediate degrees of flexibility.

As of April 1999 (Table 1), 37 countries (20% of all) share a common currency through monetary union (including the EMU members and the CFA zone members) or adoption of a foreign currency. Currency boards are observed in 8 countries only (like in Argentina or Hong Kong) while fixed exchange rates are still prevalent in 44 countries. Moving rates and various types of exchange rate bands are maintained in 23 countries. 25 countries adopt managed floats without a previously announced exchange rate target. Almost twice that number – 48 countries – have in place an independently floating exchange rate (many of them allowing for sporadic interventions without attempting to influence the exchange rate in the medium term).

However the shift away from intermediate exchange rate systems and toward extreme arrangements – in particular currency unions and free floats – is still far from complete. For instance, both Chile and Colombia replaced their crawling bands by free floats in September 1999. Ecuador announced in January 2000 that it would soon adopt

unilaterally the US dollar. Argentina has been toiling for some time with the notion of adopting the US dollar, too.

The Asian financial crisis and its repercussions in other regions, including Eastern Europe and Latin America, accelerated giving up pegs or regimes of limited exchange rate flexibility. Pegs provide inappropriate insurance against currency risk and often lead to moral hazard, excessive short-term lending, and a terminal speculative attack that triggers either a balance-of-payments crisis alone (as in Brazil 1998-99) or a full-blown twin crisis where the latter is combined with a banking crisis (as in Indonesia 1998-99).²

The worldwide shift toward extreme exchange arrangements and the state of the debate as of today justify this paper's focus on the two basic monetary regime options that were described above. However, in reviewing the economic arguments and empirical evidence that influence this choice one has to be aware that these extreme regimes are not dominant yet (46% of countries in April 1999) and most of them are newcomers to the extreme regimes. Thus, much of the empirical evidence comes from hybrid experiences that cannot be termed clean floats or pure pegs. This has made Frankel (1999) claim that it is too early to disregard hybrid regimes and that there is still no strong theoretical case against regimes that keep the national currency with some bounded flexibility. But although this position could still find some enthusiastic supporters in Chile – those arguing in favor of using exchange rate policy to affect the level of the real exchange rate – the debate is globally giving way to focusing more on the extreme choices.

Any decision on switching monetary/exchange rate regimes will have to depend on both a cost-benefit analysis and on the political reality of the country in question. Focusing on the former from both a macro and microeconomic perspective for the case of Chile is the subject of section III below. Before that, some general considerations will be reviewed.

II.1 Credibility versus Flexibility

As some authors have argued (Frankel 1995, Edwards and Savastano 1999), the regime choice involves a trade-off between *credibility* and *flexibility*. Floating allows a country to pursue an independent monetary policy, enabling the national economy to accommodate domestic and foreign shocks – changes in terms of trade, international interest rates, and foreign financing – hence it delivers more flexibility. However, such flexibility tends to be associated (on average), to higher inflation mostly because of a time-consistency problem that brings less credibility to the anti-inflationary commitment of the policy maker. Regarding the opposite regime, a credibly fixed exchange regime – and hence even more a dollarized regime – has no flexibility stemming from monetary policy and therefore lacks an instrument to deal with shocks but exhibits a firm commitment to low inflation that makes this outcome more likely. Of course, this result depends on the assumption that the foreign (or supranational) monetary authority is less prone to pursue suboptimal monetary policies than the country deciding upon the regime choice.

² As documented empirically by Kaminsky and Reinhart (1999) and analytically by Goldfajn and Valdés (1999).

On this dimension a link can be made between this debate and the more general discussion of rules versus discretion. Rule advocates would naturally side with the idea of adopting a more stable foreign currency as a means to make clear that they do not believe in the stabilizing properties of a local monetary authority. Examples of this position for the case of Chile can be found in Rosende (1999). Two observations can be made on this debate.

First, by adopting a foreign currency discretion does not disappear but rather is shifted to a different (foreign or supranational) decision body. Whether or not the latter authority will deliver more macro stability is debatable and country specific. Empirical evidence comparing the record of countries with fixed and flexible exchange regimes is not conclusive but tends to favor the former on inflationary accounts. On one side, in looking at 136 countries from 1960 to 1989, Ghosh et al. (1995) conclude that inflation is lower and less volatile in fixed exchange rate countries. Edwards (1993), on the other side, calls attention to the problem in distinguishing between well-behaved flexible regimes and those that are forced off pegs and subsequently adopt floats under the duress of successful speculative attacks (the survival bias). After controlling for the latter bias, the author finds that pegging countries still show better inflation performance but that the result depends on the particular country's inflation history. But there are still two problems with these results. First, the data on official regime classification in the IMF database is not necessarily consistent with actual country practice. Second, there is potential selection bias (and reverse causation) when a low-inflation country adopts a peg to signal its commitment to long-run price stability.

The second observation is that a pure floating regime should not be uniquely associated to discretion or the absence of rules. On the contrary, countries that have taken seriously the flexibility/credibility trade-off (and hence the costs of high inflation) but have in place a floating regime, have been looking for alternative monetary policy frameworks that limit discretion. The best-known and increasingly more popular of these frameworks is inflation targeting that, at least in industrial countries and emerging economies like Chile and Israel, is proving to be an efficient framework for reducing inflation and attaining price stability without giving up the national currency. A recent study compares the performance of inflation targeters and non-targeters from 1985 to 1997 (all of them with their own national currencies). Inflation targeters were shown to be able to reduce inflation by more than 7% on average when comparing 1985-89 with 1993-97, which compares to a reduction of ca. 3.5% in the case of non-targeters (Cecchetti and Ehrmann 1999).

In more general terms, and beyond inflation performance, how useful is it to have an autonomous monetary policy? That is, how important is the closely related role of the nominal exchange rate as a shock absorber? On the whole, shock absorption is more relevant when shocks across countries considering a union (either à la EU or within a dollarization scheme) are asymmetric, i.e. when the business cycles of partner countries are asynchronous. In this case, a common monetary policy cannot serve stabilization in both countries at the same time. This criterion, which is among the well-known optimal currency area (OCA) requirements, is conceptually uncontroversial. However, there is controversy on the empirical importance of this element. Evidence from industrial countries does show that asymmetric shocks exist but they could be small (Bayoumi and Eichengreen 1992).

Eichengreen (1998) enlarges the sample used in the preceding study by adding the Mercosur countries. Results do not change much but shock asymmetry is less important for the Mercosur countries than for the rest of the sample.

A possible explanation for the latter result could be that trade among Mercosur countries has increased significantly, to a point where the likelihood of asymmetric shocks to member countries has declined. This brings the issue as to whether a trade union should precede a monetary union as an alternative to the view that a monetary union facilitates trade and therefore should come simultaneously with the trade union.

II.2 Flexibility or Volatility ?

The cross-country studies mentioned above for the case of inflation (like Edwards 1993, Ghosh et al. 1995, and Little, Corden, Cooper and Rajapatirana 1993), also show that the exchange regime does not have a discernible effect on growth.

However, the nature of the data makes these results not very reliable for addressing the question at hand. Much of the discussion so far has remained at a hypothetical level or drawing from some casual observations on recent experiences. At a formal level, there has been a growing literature looking at the optimality of each polar regime (including Devereaux 1999, Zarazaga 1999, Jeanne and Rose 1999, and Obstfeld 1995). A striking result of this literature is the policy implication derived from the accepted fact of high volatility of exchange rates under floating, many times beyond fundamentals. On one side, Obstfeld (1995) claims that it is not advisable to nominally anchor the economy on a price (the exchange rate) which exhibits such a high volatility. As an asset price, the exchange rate can show volatility for the same reasons asset prices do. The policy implication is that the exchange rate should be allowed to float freely and hence policy makers should look for a different and more stable anchor. In contrast, Jeanne and Rose (1999), among others, draw exactly the opposite conclusion: high volatility of the exchange rate is bad for resource allocation because it brings volatility to the real exchange rate and many other relative prices beyond fundamentals, affecting growth. So the policy implication is to abolish exchange rate volatility by giving up the national currency.

It is generally agreed that exchange rate volatility per se is harmful. But from here it does not follow that a country should give up its currency and national monetary policy. The question should rather be whether or not the market is able of delivering hedging mechanisms that allow the private sector to live with a floating rate, paying a price that does not exceed the benefits that society at large reaps by having a flexible exchange rate and a monetary policy in place.

In a number of articles, Hausmann and co-authors have argued that in the case of Latin America the balance is clearly against the floating cum hedging solution and that exchange rate volatility is extremely harmful because it brings higher interest rates and unstable policy reactions (Hausmann, Gavin, Pages-Serra, and Stein 1999, Hausmann and Powell 1999). At the heart of the argument is the alleged inability of Latin American

countries in creating a demand for financial instruments in their own currencies.³ Thus, the argument follows, hedging or derivatives markets would be either non-existent or too thin to protect agents against exchange-rate volatility. The question, however, is whether the only choice left is abandoning the local currency altogether. Doing so could be seen as a shortcut to solve the fundamental problems lying beneath but that is not guaranteed. A good example of this is the current Ecuadorian situation. And there could be countries that even though they are original sinners could be so close to earthly redemption that the drastic move towards giving up the local currency is at least dubious.

Yet volatility is the weak side of exchange rate flexibility. And flexibility is what makes floating attractive. In essence, nominal flexibility of the exchange rate allows the accommodation of different shocks that call for an adjustment in the real exchange rate. If a country were to give up its national currency because it becomes a member of a monetary union or adopts dollarization, then in assessing the move it will have to look at a number of conditions that, if met, will reduce the costs of losing exchange rate flexibility. These conditions are the OCA conditions, establishing that a very open and small economy with wage and price flexibility, intense trade with its potential partners, a diversified industrial production basis, an internationally diversified investment portfolio, and willing to accept factor mobility between itself and its potential partners, is best qualified for monetary union (Mundell 1962, McKinnon 1963).

Oddly enough, there exist just a handful of countries in the world that a priori satisfy these OCA conditions. In a series of studies, Bayoumi and Eichengreen (1992, 1994, 1996, 1997) check these conditions for many industrial countries (most of Europe, the U.S., Japan, Australasia). What they found when considering Europe is that those countries that are larger, with more asymmetric business cycles, and with highly specialized exports tend to prefer more exchange rate flexibility, as opposed to those that trade more with each other, which tend to favor more stable exchange rates. When taking into account Japan and its trading partners (the US, Canada, Australasia, some of Europe and some other Asian countries), results are virtually the same as in Europe, although the coefficient of export composition is much smaller and not significantly different from zero. Eichengreen (1998) consolidates the previous two samples with Mercosur countries and finds no substantial changes, although in bilateral comparison among Mercosur members Brazil's size vis a vis its partners dominates any other consideration.

It is perhaps for these reasons that monetary unions beyond national frontiers have been so infrequent in recent world experience. However there is an important issue of endogeneity involved here. Indeed, if it is true that a monetary union promotes trade in goods and financial capital between member countries, then this increased trade will improve some of the OCA conditions. Larger trade in goods makes business cycles more symmetric and shocks more alike in each member country, while the impact on product diversification is ambiguous; more financial trade can help in portfolio diversification.

³ Hausmann calls this the Latin American "original sin", which would lie in the secular temptation of Latin American governments to default on their public debt expressed in local currencies by resorting to inflation. This naturally discourages foreign investors to demand assets denominated in Latin American currencies because of the high risk of capital losses.

III. EVALUATION OF ALTERNATIVE EXCHANGE RATE / MONETARY REGIMES FOR CHILE

This section evaluates the desirability for Chile of maintaining the current monetary/exchange rate regime or giving up its national currency. As discussed above, the current regime is based on maintaining the national currency in a monetary framework based on inflation targeting combined with a flexible exchange rate. The alternative to the latter is giving up the peso, which can take either of two forms. One is “dollarization” understood in this paper as unilateral adoption of a foreign currency. The other is monetary union or multilaterally negotiated adoption of a common supranational currency with fellow members of the union.⁴ Most of the time, the distinction between both forms of giving up the peso is immaterial to the analysis – however whenever it matters, it will be considered.

It is also important to point out what this section does not do. First it does not evaluate monetary and exchange rate regimes – as alternatives to giving up the peso – other than Chile’s current combination of floating and inflation targeting. Second, it does not provide an assessment of the optimal choice of which foreign currency (dollar, euro, or a new supranational currency) should be adopted if the peso were given up.

This section reviews first the costs of giving up the peso, in comparison to maintaining Chile’s national currency under the current policy framework. The latter costs are smaller the better Chile satisfies the criteria of an optimal currency area (OCA) with prospective currency partners. Hence the section focuses next on conventional and non-conventional OCA criteria pointed out by the literature, providing – whenever feasible – a quantitative assessment of their relevance for Chile. Then potential microeconomic benefits of giving up the peso are reviewed for Chile. A final comparison of economic structures and monetary system performance is drawn for four Southern Hemisphere countries with different monetary systems in order to put Chile’s case in a broader perspective.

The subsequent cost-benefit evaluation and OCA criteria for Chile are made vis-à-vis a number of prospective alternative partners for unilateral dollarization or multilateral currency union. Five individual countries are considered here: the two main members of Mercosur (Argentina and Brazil), two members of Nafta (Mexico and the United States; the latter country is also of obvious importance for possible adoption of the US dollar), and Germany and/or the European Union (for possible currency union or adoption of the euro).⁵

III.1 Costs of Giving up the Peso

Giving up the peso implies sacrificing benefits derived from having a national currency. They are derived from three policy-making institutions or mechanisms that are

⁴ There are additional intermediate forms like negotiated adoption of a foreign currency which for simplicity we are not considering here.

⁵ Lack of long-term data series for particular trading blocks or currency unions – Mercosur, NAFTA, and the European Union – forces to make use of time series of dominant individual countries.

either abolished or drastically modified when giving up the peso: an independent monetary and exchange rate policy, fiscal instruments dealing with country-specific shocks, and a lender-of-last-resort function.

Independent monetary and exchange rate policy

Giving up the national currency abolishes national monetary policy (by transferring monetary authority to a foreign central bank or a supranational monetary authority) and abolishes the national nominal exchange rate. This involves incurring in four potential costs.

Importing inflation. Giving up the national currency is often motivated by the potential benefit of obtaining lower inflation. This was an important motivation of countries with weaker currencies (i.e. higher inflation) in joining EMU, including Italy, Portugal, and Greece. Importing low U.S. inflation is also a central motivation of Ecuador in pursuing dollarization. In Chile, however, the institutional foundations – reflected in orthodox fiscal and monetary policies and a well-regulated sound financial system – are laid to achieve permanently low inflation, in the Central Bank's target range of 2 to 4% per annum. Little further inflation gains, if any, could be reaped from adopting a strong foreign currency like the US dollar or the euro.⁶ Moreover an inflation rate slightly above the OECD's average 1.5-2% may be beneficial under conditions of high domestic growth and temporary price rigidities.⁷ Joining a regional supranational (say Mercosur) currency may risk obtaining higher long-term inflation if the partners' fiscal and financial institutions – or the supranational monetary authority – are weaker than Chile's.

Loss of exchange rate flexibility. Losing the nominal exchange rate as an instrument of real exchange rate adjustment involves a cost of giving up the peso that rises with the frequency and intensity of country-specific shocks and the extent of domestic price and wage rigidities that preclude quick real exchange rate adjustment through domestic price changes. In Chile, as reported below when assessing conventional OCA criteria, both factors are very much present. Hence sacrificing nominal exchange rate flexibility can have significant output, employment, and welfare costs.

Loss of stabilizing function of monetary policy. In a world where temporary nominal price rigidities are important, the latter provide the key friction that gives rise to non-neutral

⁶ A review of recent empirical studies on the costs of inflation (e.g. Sarel 1996, Andrés and Hernando 1997, Groshen and Schweitzer 1997) show that significant net growth and welfare benefits can be reaped when reducing inflation to 5% but there is no clear evidence of further gains when lowering inflation below the latter level. A different view is held by Feldstein (1996) who argues that for the U.S. even a 2% inflation rate imposes a significant welfare loss.

⁷ The reason is that under high domestic growth, the difference between the domestic and foreign traded non-traded productivity growth differential is positive, leading to real exchange rate appreciation. This Balassa-Harrod-Samuelson trend appreciation has been estimated at 0.7% per annum for Chile during the 1990s (Délano and Valdés 1998). With an OECD level of inflation rate at 1.5%, real appreciation requires lower average absolute inflation of traded goods (and a larger share of traded goods with absolute deflation) in Chile than in OECD countries. This may be costly under conditions of temporary price rigidities that are likely to be prevalent in Chile.

effects of monetary policy.⁸ While accepting the latter as a key stylized facts in modern economies, it is still open to questioning if monetary policy in any given country is conducted in a way such that it contributes to society's and the central bank's objective of output and inflation stabilization over the business cycle. Evaluation of the historical contribution of monetary policy to stabilization in Chile is beyond the scope of this paper – and there is scant empirical literature on this subject.⁹ Moreover it can be argued that the historical performance offers little guidance to the current and expected future performance of the Central Bank's contribution to stabilization. The reason is the massive structural change that is taking place in 1999-2000 regarding the policy framework and inflation performance. These changes – adoption of a floating exchange rate, improvement in the inflation targeting framework, and convergence to stationary low inflation – all contribute to a better conduct of monetary policy that translates into a structural improvement in future business cycle stabilization. Giving up this function by yielding monetary policy to a foreign or supranational authority is likely to be costly in a country where temporary nominal price rigidities and asymmetric shocks are intense, as argued below.

Loss of seignorage. With declining worldwide inflation, seignorage has shrunk from a traditional international average of 1.0% (2.1%) of GDP in industrial (developing) countries¹⁰ to only a fraction of 1% of GDP. This beneficial decline in seignorage revenue – to a large extent stemming from lower inflation tax collection – has been the result of successful worldwide stabilization during the 1990s. Additional extensive seignorage loss can be anticipated in the future due to growing substitution of electronic money for currency.¹¹ In the six countries under consideration, estimates of recent seignorage (calculated as the growth of currency over GDP, in order to make international comparison easier) are very low. They range from 0.15% of GDP per annum in Germany to 0.55% in Mexico (Table 2). Chile's seignorage stood at an average 0.25% of GDP during 1995-1998.

A currency union requires a seignorage sharing agreement among participating members, as exemplified by EMU. Unilateral adoption of a foreign currency is costly if it precludes such an agreement, e.g. Panama has yielded – and Ecuador is likely to do so in the near future – its seignorage revenue to the U.S. This cost of unilateral dollarization can be estimated as the sum of two components: an initial public-sector cost derived from the need of purchasing all national currency in the economy and the properly called seignorage cost, i.e. the revenue lost to the issuer of foreign currency, that depends on the stock of currency and GDP growth in the dollarized country and on US inflation.

⁸ Clarida, Galí, and Gertler (1999) review recent theoretical foundations and empirical findings on the conduct and results of monetary policy under nominal price rigidities and rational expectations. This approach stands in contrast to other strands of the literature that tend to reject the the idea of nominal price rigidities (e.g. real business cycle theory) or focus on other rigidities (such as frictions in money demand).

⁹ Cabrera and Lagos (1999) find that in Chile there is no clear response of production and aggregate demand to changes in the interest rate, although they are affected by the money stock. Cecchetti and Ehrmann (1999) find that countries with inflation targets have higher output volatility and lower inflation volatility than non-targeters. Medina and Valdés (2000) analyze for Chile the effect on monetary policy of adopting an inflation range target (instead of a point target) and how this affects the output gap.

¹⁰ These figures are long-term (1965-1989) averages for 15 industrial and 35 developing countries, as estimated by Easterly and Schmidt-Hebbel (1994).

¹¹ Budnevich and Lehmann (1999) analyze the likely effects of introducing electronic money on currency substitution and seignorage in Chile.

For Chile the initial cost is estimated at 2.6% of GDP and the annual seignorage loss is calculated at 0.19% of GDP (with national GDP growth of 5% and U.S. inflation of 2.5%; see Table 2). At a 7.5% discount rate, the latter annual flow is the equivalent of a once-and-for-all transfer of 2.5% of GDP to the foreign country. Among the three other Latin American countries, Brazil would incur in the lowest seignorage sacrifice, a result of having the lowest currency stock over GDP and facing lower growth prospects than Chile. This seignorage transfer, incurred under unilateral dollarization but not under a negotiated currency union, may be economically and politically unacceptable to most countries.

Fiscal coordination and intra-regional fiscal transfers

Regional coordination of fiscal policies among members of a currency union is highly desirable to take account of macroeconomic spillovers associated with stabilization policy and externalities related to budget discipline and monetary policy credibility. A separate issue, however, is how to deal with country or region-specific shocks within a currency union. In the absence of high degrees of labor mobility, wage and price flexibility, symmetry of foreign shocks and domestic business cycles, and production and income diversification, adoption of a fiscal instrument is especially important to cushion a region or a country from specific or asymmetric shocks.

Most countries in the world have developed a system of intra-country regional transfers based on taxes and transfers, administered by the central fiscal authority and enshrined in legislation. In Canada and the U.S., for instance, the federal tax and transfer systems serve as important shock absorbers to deal with province or state-specific shocks (Bayoumi and Masson 1991, Sachs and Sala-i-Martin 1992). However in the case of EMU and the EU, the central community budget is still very small in comparison to national budgets. For instance, it is estimated that only 1% of an income loss from an adverse shock hitting any member country was compensated by EU community taxes before adoption of the euro in 1999. However this is changing somewhat with the increase in structural funds approved for the central EU budget (Masson and Taylor 1993).

Joining a currency union requires developing a system of intra-regional transfers, particularly in the absence of strong labor mobility, significant price and wage inflexibility, strongly asymmetric shocks, and high production and income concentration, as in the case of Chile. Unilateral adoption of a foreign currency without a system of international fiscal transfers would be costly in this regard.

Lender of last resort

Historically and still today in most countries, the existence of a currency-issuing monetary authority has been linked to its role as a lender of last resort for the national financial system. While this dual role of a central bank has a historical rationale, it is not necessary to be maintained in this fashion. In the case of EMU, there is no central lender of last resort, a feature that could become a significant potential weakness. Currently the Central Bank of Chile provides free (but limited) explicit insurance to deposits of domestic banks.

More recently, market-based arrangements are starting to replace the central bank's or government's role of lender of last resort. Argentina's pioneering experience with contingent credit lines that domestic banks are required to open with foreign banks is very promising (Gavin and Powell 1998). Further arrangements along these lines that transfer costly explicit or implicit insurance and lender-of-last-resort guarantees – that lead to moral hazard behavior – from central banks to markets are likely to spread worldwide. In addition, opening up domestic financial markets to participation by subsidiaries of large international financial institutions contributes to transferring lender-of-last-resort functions from domestic central banks to foreign main offices.

Independently of these welcome developments, adoption of a foreign currency would require a clear redefinition of lender-of-last-resort functions and institutions. Moreover it should include adoption of a banking regulatory and supervisory framework that is similar to those adopted in other currency partners in order to minimize asymmetric exposure to moral-hazard behavior and financial crises among currency area members.

III.2 Conventional OCA Criteria

As pointed out by 1999 Nobel laureate Robert Mundell in his classical article (Mundell 1961), there are factors related to macroeconomic shocks that constrain the size of an OCA – and hence the desirability for any country to join prospective partners in a currency union. In the absence of full instantaneous wage and price flexibility, fast real exchange rate depreciation can only be accomplished through quick nominal depreciation. In the absence of full wage/price flexibility and full factor mobility between union members, asymmetric shocks will lead to unemployment. This opens room for a stabilizing role of monetary policy. Hence traditional criteria to evaluate optimality of a currency union comprise the extent of factor mobility and market flexibility, trade openness and regional interdependence, symmetry of external shocks and business cycles, and output and portfolio diversification.

Income and Inflation

Comparison of income levels, growth performance, and inflation records provides a useful starting point (Table 3). Chile's current development level – reflected by two alternative per capita income measures – is similar to that of Argentina, Brazil, and Mexico. A large gap separates the four Latin American economies from the U.S. and Germany, who exhibit per capita income levels that are 2 to 7 times those of the four Latin American economies. Per capita income in the U.S. is 6.5 times that of Chile. These are large differences in comparison to intra-European income differentials. For example, Germany's per capita GDP is 2.6 times that of Portugal, the poorest EMU member (Levy-Yevati and Sturzenegger 1999).

Regarding the closure of income gaps, Chile has been the most successful among the four Latin American countries, growing at a rate of 7.5% during 1986-1998, more than twice the growth rate of the other three Latin American countries. After its 1999 recession – the first in 15 years – Chile's growth is projected to rebound in 2000-2001.

Regarding inflation, the overall historical 1986-98 performance of the four Latin American countries ranged from mediocre to dismal, in comparison to that of industrial countries. However in the 1990s Argentina and Brazil successfully stopped their protracted hyperinflations. Argentina, which adopted a currency board in 1991 pegging its peso to the US dollar, has been particularly successful in defeating inflation. The country exhibited deflation from 1997 to 1999 and is projected to maintain almost absolute price stability in the near future. Brazil, after a small inflationary rebound in the aftermath of its exchange rate crisis in early 1999, has maintained single-digit inflation and is committed to gradually attain low inflation under floating cum inflation targeting. Mexico, with a floating regime adopted in the aftermath of the Tequila crisis and a gradually strengthened inflation-targeting regime, is also converging gradually to single-digit inflation. Chile attained in 1999 an inflation of 2.3%, well below its 1999 inflation point target, but consistent with its 2-4% target range announced for the medium term.

Factor Mobility and International Correlations

Labor mobility is low across countries, not only between industrial and developing economies but also between developing economies. Legal restrictions and cultural barriers inhibit labor mobility between Argentina and Chile – or even between Mercosur members Argentina and Brazil – although there are substantial international differences in dollar wages and employment opportunities at any point in time. In fact unemployment rates differ both historically and today between Argentina, Brazil, Chile, and Mexico – and, for that matter also between the latter countries and the U.S. and the European Union (Table 4). Mexico's 3.8% and Brazil's 5.5% average (1986-98) unemployment rates are below Chile's 7.2% and Argentina's 11.7%, and even below the U.S.' 6% and Germany's 11.2%. Current (1999) unemployment rates show a similar dispersion. Moreover, historical (1986-97) unemployment correlation coefficients¹² between Chile and Argentina, Brazil, Mexico, and Germany are large, negative, and significantly different from zero. The one unemployment correlation coefficient that is positive (at 0.47) and significant for Chile is with the U.S. However, when using a sample of quarterly data starting in 1993, the unemployment correlation between Chile and United States becomes negative, but non-significant.

As opposed to international labor mobility, worldwide mobility of financial capital is already large but still increasing. Gross flows of financial capital are increasing worldwide and for the countries considered here in particular – a result of growing attractiveness of emerging markets to international investors, technical progress in communications and capital mobility, and the dismantling of capital flow restrictions in most emerging economies. Argentina, Brazil, and Mexico have eliminated most or all of their capital restrictions during the 1990s. Chile has eliminated all restrictions on capital outflows and most restrictions on inflows during the 1990s.^{13 14}

¹² In all tables, statistically significant (non-significant) correlation coefficients are reported in bold (normal) type.

¹³ Gallego, Hernández, and Schmidt-Hebbel (1999) document the relaxation of various categories of capital flow restrictions in Chile during the 1990s and their effects on key macroeconomic and financial variables.

¹⁴ A capital account liberalization index for 1995 (Morley et al. 1998) shows Chile with a relatively restricted capital account (Table 12), if compared to Argentina (the regional leader) and Mexico. Brazil shows the poorest record among all Latin American countries. However, this index does not accurately reflect current

Yet large differences in interest rates and stock market returns persist across countries (Table 4). The average short-term real bank deposit rate in Chile – at 6.3% per annum during the last 14 years – is more than twice the average rate in the U.S. and Germany. Within Latin America, these real bank deposit rates show major differences. Excluding periods of hyperinflation and adjustment, Brazil has had an average 1995-1999 rate of 17.7%, Argentina an average 6.2% rate (1993-1999), and Mexico a very low average rate of 0.14% (since 1992).

Another way to assess financial integration between Chile and prospective partners is checking for the contemporaneous correlation between Chile's and the partners' interest rates.¹⁵ Among the 5 correlation coefficients, only those for Chile and Brazil and for Chile and Mexico are significant. The correlation with Brazil is consistently positive, significant, and moderately large, although it has declined during the 1990s in comparison to the 1980s. The correlation with Mexico is positive and moderately large during the full 1986-1999 sample period but it has become significantly negative during the 1990s. Correlations with the other three countries are non-significant and close to zero.

Average stock market real returns also display considerable difference across countries during the 1990s. The correlation between Chile's stock market returns and those of other countries is somewhat larger than that of real interest rates. There is a consistently positive and significant correlation with Argentina and even larger positive correlations are observed with Brazil and Mexico during the last five years. There is no clear consistently significant correlation with the industrialized countries, although an exceptional positive and significant correlation was observed with the U.S. during the early 1990s. Larger international financial integration by and significant international financial contagion in emerging economies is likely behind the large stock market return correlations for Chile with Argentina, Brazil, and Mexico during the last six years. However Chile's zero correlation with U.S. and German stock market returns is still puzzling.

Mobility of physical capital is far more limited than that of financial capital. As first pointed out by Feldstein and Horioka (1980), the high correlation between saving and investment observed for most countries in the world can be interpreted as a puzzling lack of international capital mobility. The correlations between national saving and gross domestic investment rates for Chile and other countries generally confirm this result (Table 4), with a strong positive link between the two variables which, in the case of Chile and Germany, is close to 1 for the full 1970-1994 sample period. At shorter periods, Chile exhibits a negative saving-investment correlation during the 1970s and a very large positive correlation since 1980. Most other countries tend to confirm the Feldstein-Horioka puzzle at shorter periods, with the surprising exception of Argentina and Mexico since 1980.

In sum, labor mobility between Chile and prospective currency partners is close to zero, now and for the foreseeable future. Labor unemployment levels differ across the 6

international financial integration as many of these countries – and Chile in particular – have recorded much progress in further liberalization after 1995.

countries. Chile's unemployment correlation seems to be negative with most other countries. Although is a positive unemployment correlation with the U.S. using annual data, it becomes negative (but remains non-significant) when using quarterly observations. International financial integration has increased worldwide during the 1990s and so it has in Chile. Yet large differences in the levels of interest rates and stock market returns between Chile and prospective partners persist to date. Moreover, correlations of interest rates between Chile are zero (with 3 countries) and when they were positive and significant in the 1980s they declined in the 1990s (with 2 countries). Correlations of stock market returns are positive and significant with the three Latin American countries but zero with the U.S. and Germany during the last 5 years. Chile's low degree of physical capital integration is reflected by a very high 0.94 saving-investment correlation observed since the early 1980s.

Wage and Price Flexibility

Wage flexibility is largely determined by labor market regulations and rigidities. An estimate of the degree of labor market liberalization puts Chile ahead of Argentina, Brazil, and Mexico and behind countries like Jamaica and Peru (Table 5).

A measure of wage flexibility is the correlation between real wages and the business cycle. If wages were largely flexible, one would expect a procyclical behavior of wages, i.e. a positive correlation between the real wage and the business cycle. This is indeed the case in 4 of the 6 countries during the 1990s, since only Argentina and Chile display a non-significant correlation between the trend deviation of real wages and the trend deviation of GDP. In the case of Chile wages had displayed a significantly procyclical behavior during the 1986-1991 period but it vanished during 1992-1998. This may reflect the high degree of indexation established in Chilean contracts, as well as the strong influence on aggregate wages of public-sector wages and statutory minimum wages – both of which are largely insensitive to the business cycle.

Not only wages but also prices of services and non-traded goods at large are highly indexed to past inflation in Chile. In fact, Chile is likely to be the most indexed economy in the world to date.¹⁶ Our own subjective ranking of the extent of price indexation puts Chile clearly at the upper end among the six countries (Table 5). Argentina and Brazil eliminated indexation at the start of their stabilization programs in the early 1990s but informal indexation still exists in Brazil. In Mexico indexation seems to be low, as in the U.S. as well. In Germany it is more widespread.

Trade Openness and International Interdependence

Chile and Mexico are the most open economies among the six countries considered, as measured by the shares of trade (exports and imports) in GDP (Table 6). As measured by average import tariff rates, Chile was only slightly more open than Argentina, Brazil, and Mexico in 1998, with an 11% almost flat statutory tariff rate on imports. However that tariff rate was approximately twice the average rate prevailing in the U.S. and Germany.

¹⁶ Take, for instance, Chile's still widely used "Unidad de Fomento" (UF), which according to Shiller (1997) was the first indexed unit of account in the world. For a historical description of indexation in Chile and its relation to inflation and the real exchange rate across countries see Landerretche and Valdés (1998).

Since then, tariff rates are declining further in Chile, as a result of continuing unilateral trade liberalization that will bring down the statutory tariff rate to 6% in January 2003.¹⁷ Hence Chile's integration into world markets is already high but yet rising.

Chile's major regional trading partners are East Asia, the European Union, Nafta, and Latin America and the Caribbean. The share of Chile's trade with the European Union amounts to 25% of total trade, and the corresponding figures with the U.S. and with Nafta are 20% and 24%. The shares with Argentina, Brazil, and Mercosur at large are 8%, 6%, and 15%, respectively. Hence Chile's trade integration with its prospective currency partners ranges from small to moderately large.

Symmetry of External Shocks and Business Cycles

Chile, as well as other Latin American countries, is subject to large volatility in its terms of trade (TT), typically well above the variation of TT observed in industrial economies (Table 7). Indeed, Chile and Mexico show the largest terms-of-trade fluctuations among the six countries.¹⁸

How symmetric are the terms-of-trade shocks that hit Chile regarding those affecting its prospective partners? The answer depends on the period under consideration. For the whole 1960-1995 period, the TT correlations between Chile and Argentina, Brazil, and the U.S. range from moderate to very high. However these results are influenced by large positive correlations observed during 1960-1979. The pattern of correlations changed significantly during the last two decades (1980-1995 in the available sample), ranging from moderately positive to significantly negative correlations. This result is relatively robust to the two alternative TT measures available for Chile. 1980-1995 correlations of Chile's TT vary from nil to low and positive with the TT of Argentina, Brazil, Mexico, and Germany, with correlation coefficients that range from zero to 0.33. With the U.S., however, Chile's TT correlation is negative, moderately large, and significant since 1980 (-0.49 and -0.44, depending on the series used). Hence Chile is exposed to international price shocks that are of opposite sign to those affecting the U.S.

How symmetric is Chile's business cycle compared to that in prospective partner countries? This question will be analyzed by checking at the evidence from different angles. First, business cycle correlations can be analyzed by making use of alternative output measures. Here the focus will be on correlations between GDP growth rates (Table 8) and between deviations from trend GDP levels (Table 9). Second, different data frequencies will be used, including quarterly data (upper panels of Tables 8 and 9) and annual data (lower panels of Tables 8 and 9). Third, lagged correlations will be reported in

¹⁷ The average tariff rate is lower than the statutory rate because of special regimes depending on country of origin and product category. Chile has entered into a growing number of multilateral and bilateral trade agreements with countries and trading blocs, that involve phased reductions in tariff rates toward zero for most involved countries and products. On the other side, however, price bands and trade safeguards with high implicit tariffs are applied to a growing number of farm products and other imports that compete with domestic production.

¹⁸ Using an alternative World Bank series (TT2), Chile shows the lowest variability among the non-industrialized countries.

addition to contemporaneous correlations.¹⁹ Indeed, lagged correlations may be larger than contemporaneous correlations in the case of quantity variables – such as output or consumption – subject to international transmission and delayed reactions.²⁰ Hence correlations at lags 1 and 2 – for Chile’s variables in comparison to those of prospective partners – are reported below.

The variety of results on business cycle correlations reported in both tables suggests lack of robustness in some dimensions. The most robust result is for annual correlations for the full 1980-1998 period based on both GDP measures (lower panels of Tables 8 and 9). They are mostly positive and significant for each of the five countries, ranging from 0.20 (Argentina, GDP growth, contemporaneous) to 0.61 (Brazil, GDP growth, 2 lags).²¹ However when considering quarterly observations or shorter sample periods (the 1980s separately from the 1990s) this common pattern of positive correlations fades away.

Chile’s business cycle correlations with Argentina are not robust across different GDP measures, sample periods, and frequencies. Focusing only on quarterly observations – which tend to be more reliable for shorter samples than annual observations – one notes that the correlations with Argentina tend to change sign, from positive during 1986-1991 to negative during 1992-1998. This is particularly surprising when considering that the change in business cycle correlations takes place in the 1990s, a period of significant unilateral and bilateral trade and financial opening by both Argentina and Chile, reflected in a major increase in their bilateral trade and capital flows.

In the case of Chile’s correlations with Brazil, no clear general pattern emerges. The exception is for the 6 quarterly observations at 2 lags, that are all moderately positive and significant, ranging from 0.21 to 0.34.

Mexico’s correlations with Chile are also generally unstable. However most correlations for the 1990s (including all quarterly correlations for 1992-1998) are negative and significant, ranging from –0.18 to –0.48.

Business cycle correlations between Chile and the U.S. also tend to show a major shift in magnitude and sign during the 1990s. Using annual data, the correlations fall from a range of 0.43/0.68 in the 1980s to a range of –0.60/0.09 in the 1990s. The more reliable quarterly correlations tend to confirm this change. Indeed, Chile’s quarterly GDP correlations with the U.S. range from –0.22 to –0.48 during 1992-1998.

Regarding Germany, Chile’s GDP correlations with Germany tend to be positive and significant but there are two many exceptions to establish a clear pattern across different measures and sample periods.

¹⁹ Only significant correlations at lags 1 and 2 are reported in Tables 8-10.

²⁰ Instantaneous arbitrage in world commodity and financial markets suggest to focus only on contemporaneous correlations in the case of interest rates, stock market returns, and terms of trade, as was done above.

²¹ The only exception is Mexico, with a negative significant correlation with GDP growth and 1 lag.

In sum, Chile's business cycle is asynchronous with the business cycles in prospective partner countries. Only when using annual observations for the full 1980-1998 historical sample, correlations with each of the 5 countries are positive. This result is strongly determined by positive co-movements observed during the 1980s, which were likely caused by the second oil crisis, the U.S. monetary crunch, the Latin debt crisis, and the world recession and subsequent recovery. In contrast, when comparing Chile's international business cycle correlations in the 1980s with those during the 1990s, they often turn from positive to negative. Most of Chile's quarterly GDP correlations with Argentina, Mexico, and the U.S. are negative and significant during the 1990s. Hence Chile fails this classical OCA criteria.

Similar correlations for real private consumption growth rates and deviations from trend, based on annual data, are calculated for Chile and the 5 countries (Table 10).²² Due to the lack of robustness across different sub-samples and consumption measures, only the results on the full 1980-1998 period are briefly discussed next.

Chile's consumption correlations with Argentina are positive and range from 0.18 to 0.52, exceeding comparable GDP correlations. Consumption correlations with Brazil are zero. Correlations with Mexico are positive and significant, ranging from 0.26 to 0.42. Chile's consumption correlation with the U.S. are moderately negative (-0.21 to -0.22) but not significant. The largest consumption correlations are those with Germany, ranging from 0.31 to 0.69.

It is useful to put the results reported here in a broader perspective of recent empirical studies on cross-country comovements. Loayza, López, and Ubide (1999) use an error-components model to study GDP growth comovements between different countries of Europe, Asia, and Latin America. They find significant comovement between Chile and Brazil while Chile does not exhibit significant comovement with Mexico. However the results suggest that business cycles in Latin American countries are not mainly influenced by regional forces but mostly by country-specific factors and shocks that originate in other areas like Europe or the U.S. The low levels of comovement within Latin America differ from the strong links found within Europe or Asia.

Licandro Ferrando (1998) compares similarities of supply shocks affecting Mercosur to those affecting NAFTA and EMU. There seems to be more asymmetry in Mercosur than in the other two blocks. Levy-Yevati and Sturzenegger (1999) refer to Bayoumi and Eichengreen (1994) and Kenen (1995) which show that shocks affecting Mercosur are larger than those affecting NAFTA and EMU. Licandro Ferrando also finds increasing symmetry within Mercosur during the last years as trade integration has increased. Although Chile is not a Mercosur member and hence was not included in the previous sample, one should note that the latter result runs counter to the findings of this paper that show that Chile's business cycle got more desynchronized with Argentina's during the 1990s.

²² No quarterly 1980-1998 consumption data are available for any of the 4 Latin American countries.

Output and Portfolio Diversification

Country specialization in production, exports, and asset portfolios makes a currency union less attractive. Chile's production and exports are indeed highly concentrated in natural resources and manufacturing based on commodities. The country's share of agriculture and mining in GDP is 16%, significantly higher than Argentina's 10% share and twice the shares in Brazil and Mexico (Table 11). The same result holds for the share of total exports, where primary products represent a huge 85% in Chile – a figure that is much larger than comparable shares in Argentina, Brazil, and Mexico.

International diversification of asset portfolios held by Chilean residents is still low but growing. Foreign direct investment flows by Chileans abroad (particularly toward neighboring countries) is rising and so is the share of Chile's private pension assets that are held abroad. The latter have attained 14% of total pension assets or 7% of GDP in late 1999 – a much larger figure than the shares invested abroad by private pension funds of other Latin American countries (Table 11). However Chile has still there a long way to go before attaining well-diversified portfolio holdings by its residents, requiring large future gross capital flows in both directions.

Final remark

A final but important point related to OCA criteria requires to be addressed. The conditions on which evaluation of OCA criteria are based are not static. They not only do change over time (as illustrated by the change of GDP correlations reported above) but are also likely to be affected by changes in monetary regime. In fact, it is often argued that wage and price flexibility, trade openness, international integration, and portfolio diversification could increase after adopting a foreign currency (Masson and Taylor 1993). Indeed this is expected to occur under EMU – although there, as elsewhere, it is hard to disentangle the contribution of monetary union from the effects of all other dimensions of European economic and political union.

Yet there is one dimension that may evolve in the opposite direction as a result of giving up the peso. As a result of the microeconomic benefits to trade and integration derived from adopting a foreign currency (discussed below), it is likely for output specialization to increase. Chile is already quite specialized and open, but further trade and integration are likely to occur if microeconomic gains of adopting a foreign or common currency are reaped. However more output specialization intensifies the consequences of country-specific foreign shocks and domestic output shocks, reducing the comovements (or raising asynchronization) of the business cycle in Chile and that of its prospective currency partners.

III.3 Non-Conventional Criteria

In addition to the traditional criteria derived from Mundell's classical OCA arguments, a number of non-conventional economic and institutional features bear on the choice of a currency regime. The importance of showing progress in these dimensions before initiating monetary union has been clearly demonstrated in the case of EMU.

Overall progress in structural reform

Attaining an advanced stage of progress toward market liberalization and structural reform is desirable before adoption of a foreign currency. Deregulated domestic markets and an open economy to international trade and capital flows raise the microeconomic benefits and may lower the macroeconomic costs of monetary integration. The EMU experience is a case in point: significant progress in structural reform – and, moreover, in full factor market integration – was achieved before adoption of the euro. Close coordination on domestic regulations and supervision of labor and financial markets – or preferably adoption of common laws and regulations governing factor markets – is highly desirable before adopting a common currency.

Chile's overall structural reform indicator for 1995 is similar to that of prospective partners Argentina, Brazil, and Mexico (Table 12). This leaves all of them relatively advanced for adopting a foreign currency.

Fiscal stance

A sound fiscal and monetary stance is a prerequisite for smooth adoption of a foreign currency. In particular domestic fiscal policy has to be strengthened in a currency union in order to maximize monetary policy credibility and preclude bailing out of weak fiscal members by their stronger partners or – even worse – by the regional central bank. Achieving stronger fiscal positions in all prospective EMU member countries before their joining of monetary union was the purpose of the Maastricht prerequisites on fiscal position, inflation, and interest rates. They involved four ceilings: a government budget deficit of 3% of GDP, an overall government debt of 60% of GDP, inflation of 1.5% above the average of the 3 countries with lowest inflation rates, and a long-term nominal interest rate of 2% above the average of the 3 countries with lowest inflation.

Do Chile and its prospective partners satisfy the Maastricht criteria? Chile satisfies three prerequisites, with low inflation, budget deficit, and government debt. (Tables 3 and 12). Only the current interest rate is higher in Chile than the Maastricht ceiling – but it is lower than in all other Latin American countries. Obviously, Argentina, Brazil and Mexico do not meet the Maastricht criteria on interest rates. In addition Brazil fails to accomplish Maastricht criteria regarding inflation and the budget deficit, while Mexico exceeds the inflation ceiling.

Monetary union as part of a larger process of overall economic and political union

It is hard to disentangle if EMU's success – and by how much – is due to monetary union itself or to the preceding process of overall economic (and political) European integration in goods, factor, and asset markets. In addition, European union members had reformed domestic legislation and regulation of the latter markets in a coordinated way since the 1980s. Coordinated structural reform of domestic goods, factor, and asset markets and their full integration across the union reduces the likelihood of asymmetric shocks and, when they occur, ensures that they will be less costly. Hence macroeconomic costs of currency union are reduced and microeconomic benefits are enhanced by overall economic integration.

Chile, vis-a-vis prospective currency partners, stands far away from the EMU model of overall economic and currency union. Abstracting from meeting narrow fiscal and financial (Maastricht) criteria, domestic legislation and regulation governing all relevant markets is very different in Chile from that in Mercosur countries, or in Mexico, the U.S. or the EU. Whichever prospective currency partners Chile may consider, the country would have to go a long way of overall economic (and political) union, of which monetary union would come at a relatively late stage. Unilateral adoption of a foreign currency would have the disadvantage of not allowing such coordinated economic union to take place.

III.4 Benefits of Giving up the Peso

The benefits of giving up the national currency are microeconomic in nature. We review four potential benefits in the context of Chile.

Lower foreign-currency transaction costs

Giving up the national currency eliminates the need for currency conversion and reduces corresponding international trade and financial transaction costs when trading with the country or monetary union members whose currency has been adopted and with those other countries with whom transactions are conducted in the adopted currency. For the case of EMU, transaction cost savings from adopting the euro were estimated, as mentioned before, at 0.4% of GDP per year for the average union member (Emerson et al. 1992). Larger benefits accrue to smaller European countries with less developed financial systems, higher initial foreign-currency transaction costs, and larger trade shares with other EMU members. For New Zealand, a hypothetical currency union with Australia is estimated to bring about transaction savings of 0.13% per year (Hargreaves 1999).

Chile's financial system is relatively developed and foreign-currency transaction costs are relatively small in international comparison and particularly compared to the average European country before adoption of the euro. On the other side, unilateral adoption of the U.S. dollar would cover a much larger share of foreign transactions – roughly 90% of Chile's foreign transactions are conducted in US dollars, compared to only 14% of EU trade conducted as intra-EU trade. Adoption of a common currency with Mercosur would provide much smaller transaction savings, considering the low share of Chile's transactions with Mercosur countries, equivalent to 15% of Chile's total trade.

In the absence of a detailed calculation based on foreign-currency transaction flows and margin transaction costs for Chile, we estimate that the benchmark EMU transaction savings of 0.4% of GDP is an appropriate upper bound of this benefit for Chile in the event of adoption of the US\$. The corresponding upper bound estimate for a currency union with Mercosur is 0.07% of GDP transaction cost savings.²³

²³ The latter figure is the product of the transaction cost savings of adopting the US dollar (0.4%) and the authors' estimate of the ratio of Chile's transactions in Mercosur currency relative to transactions in US dollars (17.5%).

Less market segmentation and larger goods market integration

Maintaining a national currency may better allow firms to discriminate prices in different countries separated by different monies. Arbitrage through international trade may be obscured by quotations in different currencies at rates that fluctuate a lot.

An additional related cost of a national currency stems from home bias on the demand side: people and firms tend to spend relatively more on nationally produced goods and services, after controlling for other demand determinants. International evidence suggests that national spending displays some home bias (McCallum 1996, Wei 1996, Helliwell 1998).

It is very hard – for two reasons – to quantify the benefits of giving up the currency that arise from lower price discrimination on the supply side and lower home bias on the demand side. First, imperfect competition among suppliers and cultural barriers on the demand side are likely to be much more important than the currency veil in causing price discrimination between countries and home bias, respectively. Second, it is difficult to isolate the gains due to adoption of a foreign currency and the gains that arise from simultaneous trade, financial, and political integration and reforms that parallel currency union or unilateral adoption of a foreign currency. These difficulties are not made easier for the Chilean case, which lacks any study on these subjects.

Larger international trade from lower exchange rate risk

The elimination of exchange rate risk when adopting a foreign currency is beneficial to exporters and importers – and to producers and consumers of traded goods at large. The international evidence shows that (i) exchange rate volatility is higher in more flexible exchange rate systems, and (ii) an important part of real exchange rate volatility is due to fluctuations in nominal exchange rates (Taylor, 1995). On the other hand, exchange rate fluctuations that occur in response to terms of trade shocks reduce domestic price volatility (Hargreaves 1999). This is precisely one of the macro benefits of maintaining a national currency: the desired exchange-rate response to a foreign shock. On balance, however, it is likely that exchange rate volatility does more harm than good to traded-goods activities.

How costly is exchange rate volatility for trade? International evidence on the impact of exchange rate volatility on exports ranges from inconclusive (IMF 1984) to small but statistically significant negative effects (Dell' Ariccia 1998). Caballero and Corbo (1988) find, for several least developed countries, a strong negative effect of real exchange uncertainty on export performance.

Modern financial markets provide some hedges against exchange rate risk in the form of forward contracts and options. While there is a strong development of these markets, both internationally and in Chile, there is still a long way to go before reaching a stage where a deep market of exchange forwards and options offers an array of products covering all horizons and customer needs. In the meantime, currency risk can and is certainly not diversified away yet, and hence is likely to affect negatively Chile's international trade and trade-related activities.

Elimination of exchange rate risk premium

The second exchange rate risk-related benefit of giving up the local currency is elimination of the exchange rate premium. In the case of Chile, this premium on annual maturities ranges currently from 0.57% to 3.7% per year (see below). When preserving the national currency, domestic interest rates are increased by the amount of the risk premium. A higher cost of capital lowers investment and growth. It also distorts portfolio allocation (between domestic and foreign assets) and intertemporal consumption decisions, reducing consumer welfare further. Estimation of these output and welfare costs for Chile is not easy because they are model-specific and exchange-rate premiums are volatile. Hence there is fertile ground for future research on this as well as on the preceding potential gains of giving up the peso.

III.5 Economic Structure and Monetary System Performance in the Southern Hemisphere

It is revealing to compare economic structure and monetary system performance in a small sample of Southern Hemisphere countries. Argentina, Australia, and New Zealand, in addition to Chile comprise the group. Argentina, with a currency board since 1991, is currently considering adoption of the US dollar. New Zealand has a floating exchange rate regime in place, combined with explicit inflation targeting since 1990. Discussion of a possible monetary union with Australia has been going on for a decade in New Zealand.²⁴ Australia has also a floating exchange rate in place, coupled to explicit inflation targeting since 1993. Chile, as mentioned above, has recently adopted a floating exchange rate system and is strengthening its inflation targeting regime adopted in 1990.

Conventional OCA Criteria

The comparison starts with assessing some conventional OCA criteria across the four countries (Table 13). Relative trade intensity with the U.S. is highest in Chile, at 20.4% of Chile's total trade. New Zealand's trade with Australia is slightly larger, at 22.5% of New Zealand's total trade.

As discussed above, Chile's business cycle and consumption correlations with the U.S. patterns tend to be negative, particularly during the 1990s. The opposite has occurred with Argentina's business cycle correlation with the U.S., which has changed from negative in the 1980s to positive in the 1990s. By contrast, Australia's business cycle is very strongly and positively correlated with that of the U.S. In the case of New Zealand, the GDP correlations with both the U.S. and Australia are more ambiguous, ranging from zero (for GDP growth) to moderately positive and significant (for GDP deviations from trend). Consumption growth in Australia is not correlated with the U.S. However New Zealand displays a strong positive consumption correlation with the U.S. but not with Australia.

Specialization of both GDP and exports is comparatively very high in Chile. As discussed above, Chile's share of agriculture and mining in GDP is 16% and the share of commodity exports in total exports is 85%. Although Argentina, Australia, and New

²⁴ Among the most recent papers on monetary union issues relevant for New Zealand are Coleman (1999), Hargreaves (1999), and Hargreaves and McDermott (1999).

Zealand are commodity exporters among the group of middle and high-income economies, their production and exports are much more diversified than Chile's.

In conclusion, OCA criteria for possible adoption of the US dollar are better satisfied by Argentina, Australia, and New Zealand than by Chile. Chile is the only among the four countries with significantly negative business cycle and consumption correlations with the U.S. during the 1990s. In addition its production and exports are far more specialized than those of the other three countries are. Only Chile's trade with the U.S. is larger than the U.S. trade shares of the three other countries.

Monetary System Performance

A major dimension of the performance of a monetary system relates to inflation. Under a currency board, Argentina has been able to attain a result very close to price stability; in fact, average annual inflation has been negative at -0.5 % in 1998-99 (Table 14). Australia and New Zealand have recorded average annual inflation rates of 1.2% and 0.03%, respectively. They are consistent with their corresponding inflation target ranges of 1 - 3% and 0 - 3%. Chile, as discussed above, has recently attained an inflation outcome that is also consistent with its publicly announced medium-term inflation range of 2-4% per year.

In sum, both Argentina's currency board regime and regimes that combine floating rates with inflation targeting in Chile, Australia, and New Zealand have been successful in delivering price stability. As opposed to other countries where dollarization is considered because of the inability of the local monetary authority to deliver low inflation, dollarization – or joining a monetary union – is not an option justified by such a concern in these four countries.

Another dimension to be considered next is exchange risk premiums. A basic presumption is that countries with more flexible exchange rate regimes should exhibit larger exchange risk premiums. However this is not observed in the countries considered here.²⁵ Last year's average annualized residual exchange risk premiums (or spreads) implicit in long-term (10-year) bond spreads are 0.57% for Chile and 0.04% for New Zealand. Although there is no comparable information on long-term exchange risk premiums for Argentina, January 2000 1-year exchange risk premium in Argentine peso futures markets was ca. 5%. An alternative measure of short-term exchange risk premiums is provided by the difference between local-currency and US- dollar 90-day deposits at domestic banks. The 1999 annual averages were 3.70 % for Chile and 2.80% for Argentina, and 0.36% for New Zealand. These spreads are highly volatile in both Chile and Argentina.²⁶ The January 2000 spread in New Zealand 0.36%. This evidence suggests that adoption of a fixed exchange rate – even associated to a currency board – does not necessarily help to reduce exchange rate premiums. Argentina, 9 years after its adoption of a currency board, maintains relatively high levels of exchange rate risk premium. In fact,

²⁵ Basic data for comparable calculations for Australia were not available.

²⁶ For instance, in May (December) 1999 these exchange risk spreads were 5.5% (0.89%) in Chile and 1.4% (4.4%) in Argentina.

high exchange rate risk premiums is one major motivation for Argentina to consider dollarization (Hausmann and Powell 1999).

Implicit country risk premiums on long-term sovereign U.S. dollar-denominated debt should not be much affected by the type of monetary system. However they also display major differences among the four Southern Hemisphere countries. Average 1999 country risk spreads on 10-year sovereign debt paper over 10-year U.S. treasuries attained 1.93% for Chile, 8.56% for Argentina, and 0.83% for New Zealand.

In sum, adoption of fixed exchange rates is no guarantee for attaining low exchange risk premiums. Nor should it help in reducing country risk premiums. Argentina's currency board has delivered higher exchange rate risk and country risk premiums – and hence higher interest rates – than those observed in other countries with floating rates and inflation targeting.

IV. CONCLUSIONS AND POLICY IMPLICATIONS

This paper has analyzed the pros and cons of giving up the national currency by either unilateral adoption of a foreign currency or negotiated adoption of a common currency with prospective partners. First theoretical arguments and empirical evidence found in the literature on the choice of monetary / exchange rate regimes were reviewed. Then the costs and benefits of giving up the peso were analyzed for Chile, vis-a-vis prospective currency partners and in comparison to other Southern Hemisphere countries.

Today's debate is moving towards whether to have a national currency whose value is determined by the market or to replace it by some other country's money or some regional supranational currency. The international evidence regarding exchange rate regimes confirms that this as a trend of the last few years. The regime choice involves a trade-off between *credibility* and *flexibility* which cannot be fully solved by either regime. However, the potential inflationary bias of a floating regime can be dealt with by setting rules constraining discretion of the monetary authorities, like in an inflation target framework.

It is striking that most empirical studies find that just a handful of countries comply with generally accepted preconditions for forming a monetary union. This may explain why monetary unions were so rare until the birth of the euro. In the end, it takes a strong conviction, based perhaps on non-economic arguments, to abandon the flexibility of a floating exchange rate in favor of potential microeconomic benefits reaped by monetary union.

The evaluation of monetary / exchange rate regime choice performed in this paper for Chile was based on a review of the costs and benefits of giving up the peso in comparison to maintaining the current regime based on inflation targeting and a floating exchange rate. The main costs of giving up the peso are derived from abolishing or drastically modifying three policy-making institutions or mechanisms.

The first one is relinquishing national monetary and exchange rate policy, which is potentially costly for Chile because it involves four possible losses. Higher imported inflation is a relevant cost if Chile joins a monetary union with partners that exhibit weaker fiscal and financial fundamentals. Losing nominal exchange rate flexibility can impose significant employment, output, and welfare losses in a country – like Chile – that faces intense shocks and substantial temporary wage and price rigidity. Losing monetary policy has the drawback of giving up on its stabilizing role – a function that has been recently enhanced with Chile’s attainment of low and stationary inflation. Finally yielding seignorage to a foreign country or supra-national central bank implies giving up an annual seignorage cost estimated at 0.2% of GDP and requires buying back from the private sector the initial currency stock (2.6% of GDP).

Second, regional coordination of fiscal policies among members of a currency union is highly desirable to take account of macroeconomic spillovers associated with stabilization policy and externalities related to budget discipline and monetary policy credibility. Joining a currency union requires developing a system of intra-regional transfers, particularly in the absence of strong labor mobility, significant price and wage inflexibility, strongly asymmetric shocks, and high production and income concentration, as in the case of Chile. Unilateral adoption of a foreign currency without a system of international fiscal transfers would be very costly in this regard.

Third, it is often argued that giving up the national currency involves sacrificing the lender-of-last-resort function. This is only partly true, as market-based schemes of liquidity provision and a growing presence of large international banks are reducing the need for central bank provision of the latter function. Nonetheless adoption of a foreign currency would require a clear redefinition of lender-of-last-resort functions and institutions. Moreover it should include adoption of a banking regulatory and supervisory framework that is similar to those adopted in other currency partners in order to minimize asymmetric exposure to moral-hazard behavior and financial crises among currency area members.

Conventional OCA criteria provide a useful first yardstick for evaluating the convenience of giving up the Chilean peso in favor of unilateral adoption of a foreign currency or negotiating joining of a currency union with suitable partners. Current mobility of labor between Chile and prospective partners is extremely limited. Not surprisingly, differences of unemployment rates are much larger between Chile and prospective partners than between regions within Chile. Moreover, Chile’s unemployment rate is negatively correlated with most prospective partners (the exception could be the positive unemployment correlation coefficient with the U.S. on annual data, which disappears with the use of quarterly data).

International financial integration has increased worldwide during the 1990s and so has it in Chile. Yet large differences in the levels of interest rates and stock market returns between Chile and prospective partners persist to date. Moreover, correlations of interest rates between Chile are zero (with 3 countries) and when they were positive and significant in the 1980s they declined in the 1990s (with 2 countries). Correlations of stock market returns are positive and significant with the three Latin American countries but zero with the U.S. and Germany during the last 5 years. Chile's low degree of physical capital integration is reflected by a very high 0.94 saving-investment correlation observed since the early 1980s.

The evidence suggests that wage and price flexibility is relatively low in Chile. Excepting Argentina, Chile shows the lowest degree of real wage procyclicality among the six prospective partners. Moreover, while real wages in Chile were procyclical in the late 1980s, they do not correlate with the business cycle after 1991 – a possible sign of increasing labor market rigidity. Regarding overall indexation of prices of goods, services, labor, and capital, casual evidence suggests that Chile is still the most indexed country in the world.

Chile is a very open economy as measured by the low level of trade protection and the relative size of its foreign trade, in comparison to prospective Latin American partners. Its trade is regionally diversified.

Chile's terms of trade – largely influenced by the international prices of its main exports – are very volatile and only weakly correlated with potential Latin American currency partners during the last two decades. Correlation of Chile's terms of trade with the TT of the U.S. is negative, large, and significant since 1980. Hence Chile is exposed to international price shocks that are of opposite sign to those affecting the U.S.

Another important OCA criteria is the degree of business cycle correlation, as measured above alternatively as correlations between GDP growth rates or correlations between GDP deviations from trends. The evidence shows that Chile's business cycle is asynchronous with the business cycles in prospective partner countries. Only when using annual observations for the full 1980-1998 historical sample, correlations with each of the 5 countries are positive – but this result is strongly determined by positive co-movements during the 1980s. In contrast, when comparing Chile's international business cycle correlations in the 1980s with those during the 1990s, they often turn from positive to negative. Most of Chile's quarterly GDP correlations with Argentina, Mexico, and the U.S. are negative and significant during the 1990s.

Chile's production and export specialization in commodities and commodity-based manufactures is very high, exceeding by far the degrees of specialization of Argentina, Brazil, and Mexico. International portfolio diversification is still low (but higher than in the three latter countries). While the shares of private pension assets abroad and private foreign direct investments by Chileans abroad are increasing, the country has still a long way to go before attaining well-diversified portfolio holdings by its residents, requiring large future gross capital flows in both directions.

In sum, conventional economic OCA criteria suggest that Chile is not at all a natural candidate for joining a monetary union with prospective partners in Latin America, Nafta, or the European Union. Unilateral dollarization is, from the perspective of OCA criteria, even less advisable in view of the lack of Chile-U.S. correlation of most relevant variables.

Among non-conventional criteria, Chile's advanced stage in structural reform and its sound fiscal stance make it more feasible to adopt a foreign currency. This requires, however, putting into place adequate arrangements and international institutions to deal with the sharing of seignorage, the provision of fiscal transfers to compensate for very asymmetric external and domestic shocks, the provision of public lending of last resort or development of market-based institutions that provide the latter role. This is difficult but possible to achieve in the process of a negotiated currency union but much harder to attain under unilateral adoption of a foreign currency issued by a country larger than Chile by various orders of magnitude.

Giving up the peso provides four potential microeconomic benefits. Elimination of the need for currency conversion saves foreign transaction costs by an amount that has been estimated at 0.4% of GDP per year for the average EMU member. In the case of Chile this figure could be an appropriate upper bound estimate of this benefit if Chile were to adopt the U.S. dollar. The corresponding upper-bound estimate if Chile were to join a common currency with Mercosur would be 0.07% of GDP per year. A second potential benefit – with little international evidence about its magnitude – could be reaped from less market segmentation and larger goods market integration. International trade could be boosted by a lower exchange rate risk – although the international evidence on this effect is controversial. Finally, elimination of the currency risk premium will reduce domestic interest rates and hence could boost investment and growth rates.

Chile has followed a long and bumpy road that led to the current adoption of exchange rate floating and inflation targeting. Only fully in place since September 1999, this system delivers low inflation. Chile's regime is as successful as the same regime in Australia and New Zealand – or as Argentina's currency board – in yielding price stability. As opposed to other countries where dollarization is considered because of the inability of the local monetary authority to deliver low inflation, dollarization – or joining of a monetary union – is not an option justified by such a concern in Chile.

Comparison of conventional OCA criteria and monetary system performance across four Southern Hemisphere countries that differ in monetary / exchange rate regimes reveal significant conclusions. Conventional OCA criteria for possible adoption of the US dollar are better satisfied by Argentina, Australia, and New Zealand than by Chile. Chile is the only among the four countries with significantly negative business cycle and consumption correlations with the U.S. during the 1990s. In addition its production and exports are far more specialized than those of the other three countries are. Only Chile's trade with the U.S. is larger than the U.S. trade shares of the three other countries.

Comparison of exchange rate risk premiums across three countries shows that the countries with floating rates do not exhibit higher premiums than Argentina, with a

currency board since 1991. This suggests that adoption of a fixed exchange rate – even associated to a currency board – does not necessarily help to reduce exchange rate premiums. In fact, high exchange rate risk premiums is one major motivation for Argentina to consider dollarization.

Chile's choice of monetary framework, based on a floating exchange rate and inflation targeting, has made much progress since the early 1990s, but still needs some further work. There are two important policy challenges that lie ahead.

- (a) Pursue the agenda of improving the inflation targeting scheme currently in progress. This means: (i) advancing in the transparency of policy making at the Central Bank, where publication of a formal Inflation Report (scheduled for May 2000) and of Board minutes with a short delay (to start soon as well) are key pieces; and (ii) making monetary policy decisions that essentially focus on inflation, with an explicit target that anchors the economy and limits discretion, but in a framework that also contains a medium term orientation that builds-in some degree of flexibility (this implies a forward-looking orientation that requires a significant model development effort at the Central Bank and hopefully elsewhere as well).
- (b) Completing financial deregulation that facilitates more sophisticated financial markets, including development of hedging instruments to take care of risks that are inherent to a global economy and a floating exchange rate regime (derivatives, options, forwards). This has two dimensions: (i) at the domestic front, allow commercial banks to become relevant actors in the risk sharing business (already in progress); and (ii) at the foreign front, implement measures that allow development of the demand for Chilean pesos by foreigners (lifting some capital account regulations and tax restrictions still in place).

The demand for pesos abroad is essentially of an indirect nature. What is meant is that there exists the chance for Chilean corporations and financial institutions to place debt and other financial instruments denominated in pesos in the world markets. As of today, all our current foreign debt is denominated in currencies different from the peso, and this could be a reflection of lack of interest of foreign investors in peso-denominated assets. This in turn limits the development of a deep and efficient market of exchange rate hedging instruments. This limitation is not fatal, though, as the Central Bank international reserves are large (about 40% of gross foreign debt), at least half of that debt has been accumulated by export-oriented firms (naturally hedged), and the private sector has investments abroad that are equivalent to at least a third of Chile's foreign debt.

But still, deepening the peso market, both cash and derivatives, is most desirable given the large swings in currency parities that are normally associated to a floating regime. The question begging for an answer is whether foreign investors would be willing to demand Chilean debt denominated in pesos once legal regulations have been lifted. Some people have advanced a fatalist hypothesis that claims that Latin American countries are

condemned by their past misbehavior in this respect²⁷. Once locals (most of the time, governments themselves) issue debt in the national currency and place it mostly with foreign investors, they face the time-consistent incentive to repudiate it by resorting to high inflation, a dynamically sub-optimal action. Foreign investors know this and thus are not willing to accept the debt at any reasonable price, demanding a heavy discount compared to debt denominated in hard currencies.

However, this is clearly not applicable to Chile. Indeed, any type of repudiation or liquidation of local currency denominated debt brings enormous costs. Thus, if a Chilean government were to take advantage of it, it is not only because of the strategic incentive, but also because there is a strong disequilibrium somewhere else (typically, an uncontrolled fiscal budget), which in turn would reflect weak institutions. However, Chile has made substantial progress in the last quarter century in strengthening economic and social institutions – and this is widely acknowledged by the markets. More than a decade of fiscal surpluses²⁸, a low public debt, and an inflation rate that has converged to industrial- country levels are the basis upon which Chile has built a strong reputation. This has significantly raised the cost of any type of strategic move like local debt repudiation – or, more generally, of resorting to higher inflation taxation again. Besides, an independent central bank like Chile's is a serious practical obstacle to such an attempt.

One of the most successful institutions put into place during the last two decades is the pension system, which as of 1999 has attained pension savings equivalent to 45% of GDP. About half of these savings are placed in public debt titles²⁹ denominated in local currency.³⁰ Hence if the government were considering repudiating or liquidating its peso denominated debt to take advantage of its strategic position, it would be risking bankruptcy of the pension system and, with it, a political revolution and severe disruption of the whole economy. Is it worth it? Definitely not. Besides, and very importantly, this public debt is mostly not denominated in pesos, but rather in a unit of account (the “Unidad de Fomento” or UF) that is indexed to past inflation. Therefore, the option of repudiation or liquidation by resorting to inflation simply does not exist³¹.

In conclusion, Chile has a good chance to be able to place debt in its local currency. Perhaps the only question left to the markets to decide is the premium they will demand for holding debt denominated in nominal pesos in comparison to holding UF-indexed peso debt.

²⁷ See Hausmann et al. (1999).

²⁸ Although in 1999 there was a small deficit basically due to the recession.

²⁹ These titles have been issued by the Central Bank, which acted as a fiscal agent in the 1983-85 rescue of the financial system in transferring resources to the banks and their debtors. The sterilization effort carried out by the Central Bank in the 1990s to absorb the huge increase in foreign exchange reserves that followed massive capital inflows did also played a role in the building up of these (mostly long run) titles.

³⁰ Indexed to past inflation. More on this below.

³¹ Someone could argue that the mechanism of calculation of the UF can be changed, allowing in the end some accommodation of the eventual government's interest in reducing its debt value. However, this change should be operated through a bill of law presented to Congress, which is more difficult than resorting to printing money.

There are two other prerequisites for successful exchange rate floating. First, maintaining of sound economic policies and fundamentals. This is key to the future of the peso (and to the future of the country) because the derived exchange rate stability reduces the micro costs associated to volatility. And second, the keeping the float as clean as possible. If fundamentals are right, any residual variability of the peso value (beyond the effects of changes in monetary policy geared at stabilizing the business cycle) should be attributed to fluctuations in foreign terms of trade and international financial contagion effects. The latter are less important the stronger the fundamentals and the better the policy mix (including the floating exchange rate regime). Thus, one can claim that, over time, contagion effects should decline by simply sticking to sound fundamentals and policies. This is exactly the recipe applied by Australia and New Zealand, two small open economies that, ahead of Chile, have successfully implemented the combination of inflation targeting and floating.

Two final remarks. Disregarding a monetary union or dollarization for Chile at the current juncture is based on a cost/benefit assessment that relies also on the country's initial conditions. In other words, Chile has attained a strong reputation based on a sound financial system, price stability under control of an autonomous central bank, a diversified and mature social security system, and respect of the rule of law. Thus any gain from dollarization or a monetary union is marginal at best and the loss of monetary policy autonomy could be high a price to pay. If that is so, political support for this type of decision (particularly dollarization) is very difficult to achieve, the more so given the bad memories Chileans have of two previous experiences of complete fixing (1959-1962, 1979-1982) that ended up in severe recessions, financial collapse and high inflation. Hence initial conditions are quite different from those in other countries contemplating dollarization.

The second remark is that these beneficial initial conditions, combined with the steps mentioned above to strengthen the peso, are good policy and advice whatever the monetary/exchange rate regime. If in due time conditions evolve towards the negotiation of macroeconomic policy coordination or the fulfillment of convergence requirements (like in Maastricht) with some other suitable countries, then the above mentioned policy recommendations will put Chile on a strong footing.

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Data Appendix

Data definitions, sources, and transformations are summarized next.

Table 1

Information on exchange rate regime classification is provided by the International Monetary Fund's *International Financial Statistics (IFS)*. The information corresponds to regimes as declared by the countries' authorities and not necessarily to the effective regimes.

Table 2

Two measures of seignorage are used: the first uses the annual growth of currency over the year's nominal GDP. Data (except for Chile, where Central Bank information is used) comes from *IFS*. The other measure, which tries to capture the cost of engaging in unilateral dollarization, is comprised by two elements: (i) the cost of replacing the currency stock with dollars (the average stock of currency over GDP, for the period 1994-98), and (ii) the annual revenue lost by the home country that gives up its currency, which can be expressed as:

$$S_t = \frac{\Delta M_t}{P_t Y_t}$$

where S is seignorage as percentage of GDP, M is the nominal stock of currency, P is the price level, and Y is real GDP. If relevant inflation (i.e. U.S. inflation) is π and domestic real GDP grows at a constant rate g , seignorage is:

$$S_t = \frac{m_t}{y_t} - \frac{m_{t-1}}{y_{t-1}} * \frac{1}{(1+p)(1+g)}$$

Using a constant currency ratio to GDP (equal to the average currency ratio to GDP defined above), seignorage is calculated using specific assumptions on country growth and U.S. inflation.

Table 3

GDP per capita data is from JP Morgan's *Global Data Watch (GDW)*. Purchasing-power parity (PPP) GNP per capita data is published by the World Bank's *World Development Indicators*. GDP growth and inflation estimates for 1999 and forecasts for 2000 and 2001 are taken from JP Morgan's *Latin American Outlook* and *Global Data Watch* and from the authors' own projections. Real private consumption growth is estimated by using annual *IFS* data on nominal private consumption and CPI series for 1980-1998.

Table 4

Annual unemployment rates are taken from various sources, including *IFS*, ECLAC's *Statistical Yearbook for Latin America and the Caribbean* and JP Morgan's

GDW. Data for all countries range from 1990 to 1998, with the exception of Germany, with data only available since 1993.

Real interest rates are market deposit rates taken from *IFS*. CPI's annual growth rate for each quarter (also from *IFS*) is used to obtain real interest rates. For the case of Chile, information on real market interest rates (which are directly observed in the market) is from the Central Bank of Chile. In order to obtain comparable values across countries, the sample periods for Brazil, Argentina and Mexico are restricted to periods after hyperinflation or post-stabilization which present either negative or extremely high positive real interest rates.

Real stock market returns (constructed using CPI inflation) are based on the following stock market indexes: IPSA (Chile), Merval (Argentina), IBOV (Brazil), HDAX (Germany) and INDU (USA).

Table 5

Information on quarterly real wages is obtained from *IFS*, International Labor Organization, the Central Bank of Chile, and the U.S. Bureau of Labor Statistics. The series are seasonally adjusted and filtered using the Hodrick-Prescott (HP) filter. Their deviation from trend (calculated as the deviation from the HP-filtered series) is compared with the business cycle (defined below) in each country. The data sample varies with countries, depending on data availability.

The business cycle (GDP deviation from trend) corresponds to the deviation of quarterly seasonally adjusted GDP from its HP-filtered value. GDP data are obtained from *IFS*, with the exception of Chile, for which Central Bank data is used.

The source of the index of labor reforms is Burky and Perry (1997) and is for 1995. The extent of price indexation is based on the authors' estimates.

Table 6

Data on trade/GDP and average tariff levels is from the World Bank's *WDI*. The countries' share in Chile's total trade are ratios obtained from data available in the Central Bank's *Boletín Mensual*.

Table 7

Terms of trade (TOT) data for 1980-1995 is from the World Bank. For Chile, a second series (ranging from 1980 onwards) is also used in the estimations. Since this is a monthly series, annual averages are used. The latter series for Chile is a chained Laspeyres index, with data on export and import prices from the Central Bank and from the *IFS*. Both series of Chile's TOT are used in the table (their correlation is 0.87).

Tables 8, 9 and 10

These tables present simple correlations between Chile and other countries for GDP growth (annual and quarterly), GDP deviation from trend (annual and quarterly), and private consumption growth. As stated above, quarterly series are seasonally adjusted, then

HP-filtered to obtain deviations from trend. Annual series are also filtered using HP. Only significant lagged correlations are reported. Data sources are the same as previously stated.

Table 11

Information on output structure and the share of primary products in exports is from ECLAC's *Statistical Yearbook for Latin America and the Caribbean*.

Table 12

The overall structural reform indicator and the capital account liberalization indexes are from Morley, Machado and Petinato (1998). Government debt and fiscal balance ratios are obtained from JP Morgan's *Global Data Watch*.

Table 13

Trade information is taken from the IMF's *Direction of Trade Statistics*. Simple correlations and data procedures and sources are the same as in previous tables.

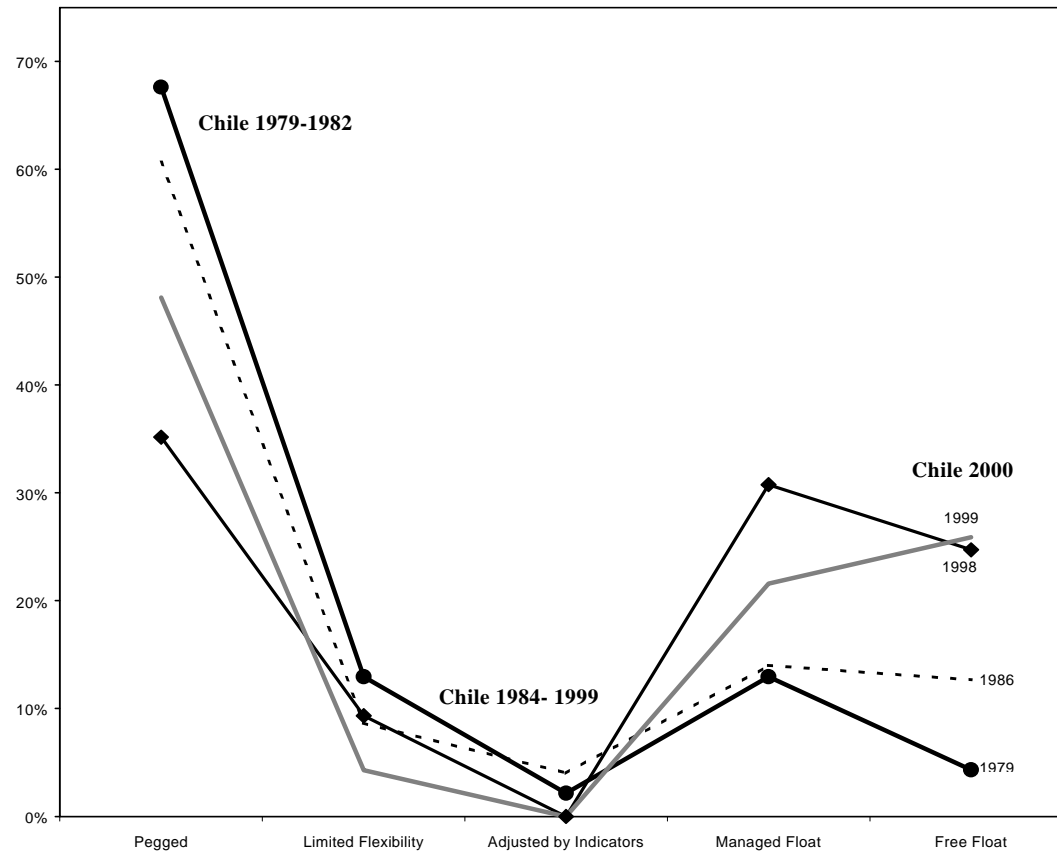
Table 14

Data sources on inflation and real market (deposit) interest rates for Australia and New Zealand are the same as for the other countries, mentioned above. Information on risk premiums is taken from Bloombergs. To calculate the long-term exchange rate risk spread, a local currency-denominated Treasury bond of 10-year maturity is compared with a similar U.S. instrument. For the case of Chile, the comparison is made against the 1-year Treasury bond that pays a real interest rate. The two instruments, differing by country of origin and currency, should present rates that differ by both sources of risk. However, as the country spread is obtained first (see below), the estimation of the long-term (10 year) currency risk spread is obtained residually.

The short-term currency risk spread is calculated by simple difference between 90-day local deposit rates in local currency and in US dollars. The country risk spread is calculated as the percentage premium over 10-year U.S. Treasury bonds implicit in secondary-market trading of 10-year sovereign government debt in US dollars.

Figure 1

Country Distribution by Exchange Rate Regimes (1979, 1986, 1998, 1999).



Source: IMF, International Financial Statistics.

Table 1
Country Distribution by Exchange Rate Regimes (April 1999)

	Number of Countries	Percentage
Common Currency	37	20
Currency Boards	8	4.3
Fixed Exchange Rates	44	23.8
Horizontal Bands	8	4.3
Moving Rates	6	3.2
Moving Bands	9	4.9
Managed Floating without a previously announced target	25	13.5
Independent Floating	48	25.9

Source: IMF, International Financial Statistics.

Table 2
Seignorage

	Chile	Argentina	Brazil	Mexico	United States	Germany
Seignorage/GDP (1) (%, Average, 1995-1998)	0.25	0.20	0.41	0.55	0.34	0.15
Initial loss from dollarization (2) (% of GDP, average 1994-1998)	2.6	4.4	2.2	3.2	----	----
Seignorage loss from dollarization (3) (% GDP)	0.19	0.25	0.12	0.21	----	----

(1) Ratio of annual (december to december) growth in currency to nominal annual GDP.

(2) Ratio of december currency stock to nominal annual GDP

(3) Assuming currency/GDP as in (2), USA inflation of 2.5% and GDP growth of 5% for Chile, 3.5% for Brazil and Argentina and 4.5% for Mexico.

Source: Authors' calculations based on raw data from IMF and Central Bank of Chile .

Table 3
Growth and Inflation

	Chile	Argentina	Brazil	Mexico	USA	Germany
Income						
Per capita GDP (1998,in US\$ at market exchange rate)	4922	8256	4794	4134	32048	28280
PPP Per capita GNP (1997,in US\$ at PPP exchange rate)	12240	10100	6350	8110	29080	21170
GDP Growth (%)						
1999 (Estimated)	-1.1	-3.3	0.9	4.0	4.0	1.3
2000-2001 Average (Forecast)	5.0	3.5	3.5	4.6	3.1	3.6
Average (1986-1998)	7.5	3.5	2.3	3.1	2.7	2.9
Std. Dev. (1986-1998)	2.5	4.5	2.7	3.6	1.3	3.5
Inflation (%)						
1999 (Estimated)	2.3	-1.7	8.9	12.3	2.9	1.1
2000-2001 (Average forecast)	3.5	0.5	5.6	10	2.5	1.4
Average 1986-1998	14.5	1104.7	804.5	42.03	3.2	1.95
Std. Dev. 1986-1998	7.7	3724.6	1055.7	47.55	1.2	1.73
Real Private Consumption Growth (%)						
Average (1980-1998)	4.7	1.7	-0.4	1.9	3.1	2.8
Std. Dev. (1980-1998)	7.1	1.7	47.9	11.9	1.6	4.8

Source: IMF, World Bank, JP Morgan, Authors' Projections.

Table 4
Factor Markets

	Chile	Argentina	Brazil	Mexico	USA	Germany
Unemployment Rate						
Average (1990-1998)	7.2	11.7	5.5	3.8	5.9	11.2 (1993-98)
1999	9.8	13.8	7.5	2.6	4.2	10.5
Correlation with Chile (Annual, 1990-1998) (quarterly, 1993:1-1999:2)		-0.47	-0.71	-0.28	0.47 -0.07	-0.62 (1993-1998)
Real Market Interest Rate (Annual) (1)						
Average (Quarterly, 1986:1-1999:3)	6.3	6.2 (93:3-99:3)	17.7 (95:3-99:3)	0.14 (92:3-98:3)	2.7	2.6
Correlation with Chile (Quarterly)						
1986:1-1999:3		-0.04	0.27	0.41	0.03	-0.09
1986:1-1991:4		-0.01	0.45	0.54	-0.15	0.16
1992:1-1999:3 (2)		0.09	0.39	-0.21	0.09	-0.07
Stock Market Real Return (Annual Rate)						
Average (Quarterly, 1990:1-1999:3)	35.2	18.9	118.9	24.6	14.1	15.1
Correlation with Chile						
1990:1-1999:3		0.37	0.17	0.4	0.15	0.07
1990:1-1993:4		0.32	-0.03	0.24	0.43	0.19
1994:1-1999:3		0.54	0.8	0.58	0.21	0.03
Correlation Between National Saving and Gross Domestic Investment (Annual)						
1970-1994	0.89	0.38	0.66	0.57	0.61	0.88
1970-1980	-0.58	0.39	0.98	0.98	0.97	0.65
1980-1994	0.94	-0.01	0.61	-0.22	0.51	0.92

Source: IMF, CEPAL, World Bank.

- (1) In order to have comparable values of average real interest rates between the countries, the samples for Brazil, Argentina and Mexico are adjusted, not considering hyperinflation or adjustment periods, which present either negative or extremely high values.
- (2) Correlations for this period, in the case of the South American countries, correspond to the sample for which the average real interest rate for each country is presented.

Table 5
Wage and Price Flexibility

	Chile	Argentina	Brazil	Mexico	USA	Germany
Index of Labor Market Reform (1995) (1)	2	-1.1	-2.3	-3.3	n.a.	n.a.
Correlation Between Real Wage Deviation and GDP Deviation from Trend (Quarterly)	0.27 (1986:1-1998:4)	-0.05 (1990:1-1994:4)	0.58 (1991:1-1998:2)	0.58 (1990:1-1998:2)	0.33 (1990:1-1998:4)	0.41 (1990:1-1994:4)
	0.40 (1986:1-1991:1)					
	0.07 (1992:1-1998:4)					
Price Indexation	High	Medium	Low	Low	Low	Medium

Source: IMF, International Labor Organization, Bureau of Labor Statistics, Central Bank.

(1) Source: Burki, S. and G. Perry (1997). The labor market reform index, centered on zero, is built by aggregating over a series of indicators of labor market restrictions. The index increases with the degree of labor market deregulation or reform. The highest value of the index for Latin America and the Caribbean is 4 (for Bahamas and Jamaica) and the lowest is -3.3 (for Nicaragua and Panama).

Table 6
Trade Openness and Regional Interdependence

	Chile	Argentina	Brazil	MERCOSUR	Mexico	USA	NAFTA	Germany	EU
Openness									
Trade (exports plus imports)/GDP (1997) (%)	56	20	18	n.a.	60	25	n.a.	47	n.a.
Mean Tariff (%) (1998)	11	13.5	14.6	n.a.	13.3	5.2	n.a.	6	n.a.
Trade with Chile (1998)									
Trade (% of Chilean total exports and imports)		8.1	5.8	14.6	2	20.4	24.4	4.1	24.9
Exports (% of Chilean total exports)		5	5.3	11.1	3.3	17.7	21.9	3.1	28.1
Imports (% of Chilean total imports)		10.7	6.1	17.6	0.8	22.6	26.2	4.6	21.6

Source: IMF, Banco Central de Chile, World Bank.

Table 7
External Shocks

	Chile	Argentina	Brazil	Mexico	USA	Germany
Terms of Trade (TT) (1)						
TT Coefficient of Variation (Annual, 1980-1995) TT1 (TT2) for Chile	17.7 (7.9)	11.8	8.9	21.3	4.7	6.8
TT Correlation with Business Cycle (Annual, 1980-1995). TT1 (TT2) for Chile	0.55 (0.28)	0.33	0.55	0.34	-0.41	-0.001
TT Correlations with Chile						
Annual, 1960-1995. TT1 for Chile		0.41	0.61	0.06	0.80	0.09
Annual 1980-1995. TT1 for Chile		0.27	0.14	0.25	-0.49	0.20
Annual 1980-1995. TT2 for Chile		-0.00	0.20	0.01	-0.44	0.33

Source: IMF, World Bank, Central Bank of Chile.

(1) Two alternative terms of trade measures for Chile were used. TT1 is a Central Bank of Chile TT series available on request. TT2 is a World Bank TT series.

Table 8
Symmetry of Business Cycles: Output Growth

	Argentina	Brazil	Mexico	USA	Germany
Correlations with Chile					
<i>GDP Growth (Quarterly)</i>					
1986:2-1998:4					
Current	-0.08	-0.10	-0.08	-0.1	0.39
1 Lag	0.20	---	-0.25	-0.20	---
2 Lags	---	0.32	0.17	---	---
1986:2-1991:4					
Current	-0.09	-0.08	0.04	0.09	0.38
1 Lag	0.31	---	-0.32	-0.23	---
2 Lag	---	0.33	0.34	---	---
1992:1-1998:4					
Current	-0.05	-0.12	-0.18	-0.29	0.42
1 Lag	---	---	-0.21	---	---
2 Lags	---	0.34	---	---	---
<i>GDP Growth (Annual)</i>					
1980-1998					
Current	0.20	0.21	0.26	0.44	0.29
1 Lag	0.36	0.44	-0.32	---	0.47
2 Lags	---	0.61	---	---	---
1980-1989					
Current	-0.07	0.27	0.49	0.68	0.72
1 Lag	---	0.55	0.55	---	0.59
1990-1998					
Current	0.27	0.03	-0.48	-0.09	-0.05
1 Lag	---	---	---	-0.60	0.72

Note: Lagged correlations are reported only when significant.

Source: Author's calculations based on raw data from IMF, World Bank, and Central Bank of Chile.

Table 9
Symmetry of Business Cycles: Output Deviation from Trend

	Argentina	Brazil	Mexico	USA	Germany
Correlations with Chile					
<i>GDP Deviation from Trend (Quarterly)</i>					
1986:1-1998:4					
Current	-0.02	0.09	-0.21	0.03	-0.02
1 Lag	---	---	-0.21	---	---
2 Lags	0.17	0.21	---	-0.16	0.17
1986:1-1991:4					
Current	0.05	0.28	-0.20	0.26	-0.14
1 Lag	0.22	0.20	---	---	---
2 Lags	0.27	0.22	---	---	---
1992:1-1998:4					
Current	-0.17	-0.13	-0.27	-0.48	0.25
1 Lag	-0.29	---	-0.32	-0.33	0.22
2 Lags	-0.32	0.21	---	-0.22	0.34
<i>GDP Deviation from Trend (Annual)</i>					
1980-1998					
Current	0.22	0.38	0.38	0.36	0.47
1 Lag	0.36	0.54	---	0.36	0.54
2 Lags	---	---	---	---	---
1980-1989					
Current	0.16	0.40	0.66	0.43	0.81
1 Lag	0.49	0.62	---	0.56	0.70
1990-1998					
Current	0.61	0.31	0.04	0.14	-0.32
1 Lag	0.49	0.39	---	---	---

Note: Lagged correlations are reported only when significant.

Source: Author's calculations based on raw data from IMF, World Bank, and Central Bank of Chile.

Table 10
Symmetry of Private Consumption

	Argentina	Brazil	Mexico	USA	Germany
Correlations with Chile					
<i>Real Private Consumption Growth (Annual)</i>					
1980-1998					
Current	0.20	-0.02	0.42	-0.22	0.33
1 Lag	0.52	---	---	---	0.64
2 Lags	---	---	---	---	0.31
1980-1989					
Current	0.01	-0.09	0.54	-0.11	0.08
1 Lag	---	---	---	0.53	0.88
1990-1998					
Current	0.17	-0.29	0.16	0.25	0.47
1 Lag	0.84	---	0.46	-0.98	0.73
<i>Real Private Consumption Deviation from Trend (Annual)</i>					
1980-1998					
Current	0.18	-0.07	0.33	-0.21	0.43
1 Lag	0.48	---	0.26	---	0.69
2 Lags	---	---	0.35	---	0.51
1980-1989					
Current	0.14	-0.31	0.69	-0.23	0.63
1 Lag	---	-0.46	0.46	-0.77	0.47
1990-1998					
Current	0.26	0.90	-0.30	-0.14	0.26
1 Lag	-0.49	0.82	-0.47	0.53	-0.49

Note: Lagged correlations are reported only when significant.

Source: Author's calculations based on raw data from IMF and ECLAC.

Table 11
Output and Portfolio Diversification

	Chile	Argentina	Brazil	Mexico
Structure of Output (% of GDP in mining and agriculture, 1997)	15.7	10.2	8.1	7
Share of Primary Products in Exports (%, 1997)	84.8	65.8	46.9	19.3
Share of Pension Assets in GDP (%, 1999)	7	<1	<1	<1

Source: CEPAL, World Bank.

Table 12
Non-Conventioanl Optimal Currency Area Criteria

	Chile	Argentina	Brazil	Mexico	United States	Germany
Level of Structural Reforms						
Overall Reform Indicator (1) (1995)	0.843	0.888	0.805	0.807	n.a.	n.a.
Capital account liberalization Index (2) (1995)	0.745	0.986	0.639	0.875	n.a.	n.a.
Public Finance						
Government debt/GDP (%) (1998)	38	38	42	27	62	64
Fiscal balance/GDP (%) (1999)	-1.5	-2.3	-10	-1.3	3.5	-1.9

(1) and (2) the source is : Morley, Machado and Petinato (1999). The highest value of the overall structural index is 0.891 (for Uruguay) and the lowest 0.667 (for Venezuela). For the capital account liberalization index the largest value is for Argentina and the lowest is for Brazil.

Source: IMF, JP Morgan.

Table 13
Conventional OCA Criteria in Four Southern- Hemisphere Countries

	Chile	Argentina	Australia	New Zealand
Trade Intensity with the United States (with Australia)				
Total trade with the US (% of the Country's total trade) (1998)	20.4	14.4	16.2	15.8 (22.5)
Correlation with United States (with Australia)				
GDP Growth (Quarterly)				
1986:2-1998:4	-0.10	-0.18	0.49	-0.06 (-0.04)
1986:2-1991:4	0.09	-0.39	0.69	-0.12 (-0.04)
1992:1-1998:4	-0.29	0.08	0.02	0.01 (-0.14)
GDP Deviation from Trend (Quarterly)				
1986:2-1998:4	0.03	-0.37	0.88	0.32 (0.34)
1986:2-1991:4	0.26	-0.54	0.94	0.30 (0.28)
1992:1-1998:4	-0.48	0.17	0.61	0.36 (0.50)
Real Private Consumption Deviation from Trend (Annual)				
1980-1998	-0.21	-0.1	-0.07	0.62 (-0.11)
Output Diversification (% of GDP in mining and agriculture) (1997 for Chile, and Argentina, 1993 for Australia and New Zealand)				
	15.7	10.2	9.1	11.5

Source: Author's calculations based on raw data from IMF. ECLA

Table 14
Inflation and Interest Rates in Four Southern Hemisphere Countries

	Chile	Argentina	Australia	New Zealand
Inflation (% , Annual)				
Actual Inflation (1998-1999)	3.7	-0.5	1.2	0.03
Current Inflation Target	2-4	none	1-3	0-3
Real Interest Rate (% , Annual)				
Real Interest Rate on Quarterly Bank Deposits (1986:1-1999:3)	6.7	3.4	3.9	5.2
Exchange-Rate Risk and Country Risk Premiums (% , Annual) (Average 1999)				
Exchange-Rate Risk Spread on Long-term Sovereign Bonds (1)	0.57	n.a.	n.a.	0.04
Exchange-Rate Risk Spread on Short-term Bank Deposits (2)	3.70	2.80	n.a.	0.36 (4)
Country Risk Spread on Long-term US dollar-denominated Sovereign Bonds (3)	1.93	8.56	n.a.	0.83

Source: IMF, Bloomberg, JP Morgan.

(1) Exchange-rate risk spreads on long-term (10-year maturity) sovereign bonds are calculated from local Treasury local currency-denominated bonds and a similar U.S. Treasury bond. For the case of Chile (New Zealand), the comparison is made between 10-year bonds paying a real (nominal) interest rate. The calculated differences in yields reflect the sum of exchange-rate risk and country risk premiums. Using the country risk premiums explained in note 3 below, currency risk premiums are obtained residually .

(2) The short-term currency risk spread is calculated by the simple comparison of the countries' 90-day deposit rate in local currency and in US dollars.

(3) Country risk spreads are calculated as percentage premiums above 10-year U.S. Treasury bonds implicit in secondary-market trading of 10-year sovereign government debt denominated in US dollars.

(4) Based on January 2000 rates.

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