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DEDOLLARIZATION,INDEXATION AND NOMINALIZATION: THE CHILEAN EXPERIENCE

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Preface

This paper is part of the project "Financial Dedollarization: Policy Options" launched by the Inter-American Development Bank under the coordination of Eduardo Fernández-Arias. The purpose of the project is to contribute to the policy dialogue on the macroeconomic and prudential risks associated with financial dollarization as well as to evaluate the costs and benefits of alternative financial de-dollarization strategies. The project aims at providing guidance on the design of cost-effective policy instruments to reduce financial dollarization, including selective prudential regulation and the development of attractive new markets and instruments in local currency. It focuses on domestic asset holders, as opposed to foreign investors, as the primary targets of a de-dollarization strategy.

This is one of several studies discussed in an IDB/WB Conference at the Inter-American Development Bank, December 1-2, 2003 (agenda and drafts accessible at http://www.iadb.org/regions/re1/events/index.htm).

Abstract

This paper revisits the Chilean experience with dollarization, indexation and nominalization in the 1958-2003 period. The purpose is to understand how Chile generally avoided dollarization and actually dedollarized in the 80s in order to draw some lessons for other countries. We find that many policies that Chile pursued are not easy to implement elsewhere. Some key characteristics of the Chilean process are related to initial institutional conditions and developments, whereas others are connected to macroeconomic performance and specific regulations. Indexation plays a key role in explaining how dollarization can be avoided.

JEL Clasification: E42, E43, E45, F30.
Key Words: Dollarization; indexation; UF.

1. Introduction

Financial dollarization is pervasive in many countries in Latin America, and has been crucial to understand the dynamics of a number of crises (e.g., Argentina in 2002, Uruguay in 2002) and more generally, macroeconomic performance. Thus, avoiding dollarization, and more importantly, evaluating whether to pursue dedollarization and a strategy to accomplish it, are key issues today.

This paper reviews the Chilean experience as an example of a country that succeeded in avoiding dollarization and actually dedollarized a partially dollarized financial system in the early 60s. For that purpose, it revisits its financial markets and macroeconomic experience from this point of view. In particular, it analyzes a series of specific episodes that appear to have been key to explain the current state of affairs: an economy in which both peso-denominated and inflation-indexed financial operations live together in harmony. These episodes are: (i) the dollarization and dedollarization events in 1959-62; (ii) the origins of indexation in the 60s; (iii) the partial dollarization experience of 1977-82; (iv) the dedollarization and indexation episode that followed the 1982-83 banking crisis; (v) the indexation of macroeconomic policies in 1985-1989; (vi) the persistence of indexation despite the reduction of inflation in 1990-2000; and (vii) the recent de-indexation process in 2001. Depending on the particular event, the analysis focuses on different dimensions, namely: banking regulations, capital account restrictions, macroeconomic policy, and institutional developments.

The analysis shows that, despite the success of the Chilean experience, the policy implications for other countries considering de-dollarization are not easy to implement elsewhere. Some key characteristics of the Chilean process are related to initial institutional conditions and developments, while others are connected to macroeconomic performance and specific regulations.

The initial alternative to dollarization was indexation, that took several years to develop. On the one hand, indexation succeed thanks to the early development of the UF (the

indexing unit) and indexed loans and deposits, particularly in the mortgage market, the intense use of UF-denominated debt by the government following the 1982 banking crisis, an existing demand for those instruments, and the widespread acceptance of the UF as a unit of account (which in turn relates to a solid fiscal situation). On the other hand, control over the inflation process —or avoidance of hyperinflation— when the financial system was deregulated, very high interest rates in pesos that allowed peso-denominated deposits to compete, the design of macroeconomic policy for many years taking indexation as given (without contesting it), some effective exchange controls and capital account restrictions— or avoidance of capital flight—, and the slow convergence to low inflation are all also important to explain why dollarization did not catch-up. Of course, this accomplishment was not cost-free, because indexation also developed in other macroeconomic areas generating more inflation inertia and relative price stickiness.

2. Dollarization and Dedollarization in 1959-1962

President Jorge Alessandri's administration (1958-64) pursued from the outset several measures to liberalize many areas in the economy. His program included opening the foreign trade regime, fostering foreign capital inflows and investment, and reducing government participation in the economy, including cutting current expenditures and slashing regulations in many areas. A cornerstone of the agenda was an exchange-rate-based stabilization program aimed at controlling inflation. Deregulation allowed and intended a first bout of (partial) dollarization of both private bank deposits and credit. It was thought to be a way to foster financial savings and intermediation in a highly repressed system, and to attract foreign resources. In 1962, after a Balance of Payments crisis and the abandonment of the fixed exchange rate regime, this first dollarization experience was almost completely reversed. In this section we review some of the details surrounding it.

The previous government had followed a closed-economy monetary stabilization program, based on the Klein-Saks mission's recommendations, a private American consulting firm especially hired for that purpose. This program reduced inflation from more than 80% in

1955 to 17% in 1957, although in the end it did not deliver long-lasting results. In 1958 inflation went almost as high as 33% with GDP growth below 3%.

The financial sector, in turn, was highly regulated until 1959, repressed by the standard definition. There was a cap on interest rates, which meant that average real interest lending rates ranged between -31.0% and 3.4% per year in the 1955-1958 period, with an average of around -15% (Ffrench-Davis, 1973). There was also a series of taxes on financial intermediation, and credit allocation was highly intervened. In 1958 commercial (private) banks accounted for some 55% of total financial system loans to the private sector. The rest was direct credit supplied by the Central Bank and the state-owned bank (Banco del Estado). The ratio between total commercial bank credit to the private sector and GDP was only 3.6%. Less than 3% of commercial banks' loans to the private sector and private sector deposits in commercial banks were denominated in US dollars and all were related to foreign trade.

From a macroeconomic point of view, the new government program included a fixed exchange rate and wage increases that were smaller than past inflation, based on the assumption that inflation would follow a declining path. Wage raises were typically annual for public sector workers, while private sector decisions on the issue were decentralized. The chronic fiscal deficit, which continued into this administration, was financed by external debt rather than by central bank credit during 1958-62. The initial two years of the program were a success and followed the standard exchange-rate-based stabilization pattern: domestic demand accelerated, the real exchange rate overvalued with booming imports and lagging exports. Inflation dropped to less than 6% in 1960 and bounced to 9.6% in 1961. GDP growth was almost 5% every year. In 1961, a major earthquake temporarily affected economic dynamics and put some pressure on fiscal accounts. In October of 1962 the government devalued the escudo (the currency at the moment) by 55% because of mounting pressure in the Balance of Payments. The stabilization plan was abandoned and inflation quickly accelerated to almost 30% (year on year) in the fourth quarter of 1962, and continued to fluctuate between 17% and 45% in the next decade.

Financial deregulation in 1959 included amendments to the tax code and the elimination of various controls. Among the former, a tax on bank checks was eliminated, interests on deposits were exempted from income-tax, and there was a tax amnesty for capital that had flown before to foreign jurisdictions. On the control side, reforms included several changes that facilitated both deposits and loans in foreign currency. To begin with, dollar deposits and loans were not only permitted, but encouraged. For instance, dollar-denominated deposits initially had a zero reserve requirement (while domestic-currency-denominated had a 20% rate), although they were soon equalized.

The financial changes resulted first in positive real interest rates, mainly because of the drop in inflation. Ceilings on interest rates were kept and recalculated every six months as a factor of past semester's average interest rate. According to Olivares and Tapia (1970), average real interest rates on bank loans were around 24% in 1960 and 1961. More interestingly, there was a dramatic surge in both loans and deposits in foreign currency. Figure 1 depicts the shares of these loans and deposits in total commercial bank loans and deposits in December of each year between 1955 and 1965. Foreign-currency-denominated loans increased from approximately 3% in 1958 to more than 40% the next year, and declined to around 35% in 1960 and 1961. Deposits also increased, to almost 17% in 1959 from less than 1% in 1958. They continued to decline in the two subsequent years, although more smoothly.

The difference between loans and deposits represented commercial banks' external debt, which increased significantly in a couple of years. After being virtually zero in 1958, it represented more than 10% of total loans in 1960. The sudden increase in dollar-denominated loans was partly due to a re-denomination of commercial bank loans and partly to new loans. In fact, total loans to the private sector increased markedly between the two years.

Figure 2 shows the consolidated financial system's dollar-denominated loans as a share of total loans to the private sector. It also depicts the share of commercial bank loans in system-wide total loans to the private sector. It shows that, despite deregulation,

commercial bank loans increased only from 55% in 1958 to 60%-65% in 1960-61. System-wide dollar-denominated loans followed the same pattern as commercial banks. Although the numbers in this case were less pronounced, they show that Banco del Estado also increased dollar-denominated loans.

After the 1962 devaluation, dedollarization occurred very rapidly. At the end of 1962, three months after abandoning the exchange rate peg, dollar-denominated loans in commercial banks declined to only 15% of total loans (see figure 1). The next three years they continued to decline, ending 1965 below 10%. The process of dedollarization happened rather quickly and persistently, but was not automatic. It mainly responded to four developments:

(i) The return of some financial regulations;

(ii) Because of nominal interest rate ceilings and increasing inflation, there was an important drop in real interest rates in domestic currency that attracted debtors to switch;

(iii) The hit that dollar-denominated debtors took with the devaluation, making clear the exchange-rate risk involved in this kind of operations;

(iv) The cost of the fiscal support programs implemented to avoid defaults awakened politicians to the danger of currency mismatches involved in dollar loans. Even the President mentioned the problem of dollar overlending in his annual address to Congress.

Although it is quite difficult to asses the exact fiscal cost of the support programs, it is worth mentioning that during 1962-1963 debtors had access to a 50% subsidized exchange rate. The mechanism was implemented by the Central Bank that offered debtors the possibility of purchasing dollar-denominated fiscal debt at an official (lower) exchange

rate, using a special low interest rate credit line and then selling these bonds at a later date, at market price.

After this experience, dollarization did not appear again in Chile until the mid seventies.

3. Indexation in the 60s: The Origins

Although the origins of indexation can be traced back to the financial deregulation of 1959, its importance was rather limited until 1965. Indexation, therefore, did not play any substantial role either in the resolution or in the aftermath of the 1962 dedollarization. However, given the key position it played afterwards to limit (and reduce) dollarization, it is worth taking a look at its history.

The rationale behind deposit indexation was rather simple. Substantially negative real interest rates due to financial repression in a high inflation economy was supposed to hinder savings, especially of long term nature, key for financing the housing industry. In fact, according to Morandé (1993), it was the need to foster savings to finance this industry, and the view that the market was not able to provide solutions to the problem at hand, that led to the conclusion that indexation was needed.

In 1959, a centralized savings and loans system was set to finance the construction of inexpensive homes targeted at lower-income households ("cuota CORVI"). Originally, besides interest rates, savings would be restated in April of each year according to the CPI or the wage index increase in the last 12 months, whichever was lower.

The same legislation that deregulated the financial system created in 1960 the "Sistema Nacional de Ahorro y Préstamos" (SINAP), which grouped the new private savings and loans associations (Asociaciones de Ahorro y Préstamo, AAPs) and a government S&L agency (Caja Central de Ahorro y Préstamo, CCAP). The AAP were supposed to receive savings from the public through indexed instruments and make direct loans to the same depositors for purchasing homes. The CCAP operated similarly, although it also acted

supervising AAPs, and had the capacity to insure AAP deposits and determine the indexation framework (Morandé, 1993). Initially it adopted the same mechanism as the "cuota CORVI". The SINAP was able to offer indexed loans only later on.

Later on, the Eduardo Frei senior administration (1964-70) promoted indexation in various types of financial transactions. The first important change in this regard occurred in 1965, when several hundreds of time deposit (savings) accounts in Banco del Estado, the state-owned bank, were indexed to the CPI with annual restatements. In 1964 the interest rate paid to these accounts was 11%, while inflation was higher than 40% a year. Indexation was believed to be a fair move in order to pay depositors (generally middle-class households) positive real interest rates and to curtail subsidies to borrowers, thought to be mostly richer people (Ffrench-Davis, 1973). In 1966, Banco del Estado's savings of this type increased 50%.

Another important innovation was the launching of indexed bonds in 1966, issued by the Central Bank (CAR, *for Certificados de Ahorro Reajustable*). Originally, issuing these bonds was the way that the Central Bank found to circumvent the interest rates ceilings and therefore offer competitive instruments. They were indexed to the CPI with yearly adjustments and in the beginning proceeds were loaned to the private sector to purchase domestically-produced capital goods. Later on, CARs became a source of government financing.

Only in 1967 the state-owned bank was allowed to invest the proceeds of indexed savings accounts in medium-term indexed loans. In the meantime, a portion of the indexation costs were directly paid by Banco del Estado, while another was financed by debtors through a special tax. Private mortgage banks and development banks were also allowed to lend in 1967 using indexed instruments. For that purpose, banks were authorized to issue indexed bonds with a minimum maturity of one year, while indexed loans had to have a maturity of at least three years.

A rather technical but important innovation in this period was the creation by the government of the "unidad de fomento" (UF), the key indexing unit used to this day in financial transactions in Chile. Indexed transactions by private banks had to use this unit, which was originally restated on a quarterly basis according to past CPI. None of these private operations became quantitatively important in this period.

With the creation of the SINAP and the indexation of Banco del Estado savings accounts, there was a quick surge of both indexation and financial savings. Total private financial savings increased from less than 1% of GDP in 1965 to almost 2% of GDP in 1971, with indexed savings explaining much of the action (Morandé, 1993). Figure 3 presents the share of indexed instruments in total private financial savings. It shows a strong and steady rise in this share between 1961 and 1972 from less than 8% to more than 90%. In the early 70s almost all financial savings were indexed. The figure also depicts the share in total private financial savings of funds in the SINAP and in Banco del Estado's indexed savings accounts. Both operations combined explain well the movements in the share of total indexed savings. CAR bonds (not shown) were significant between 1970 and 1972 when they averaged 7.5% of total private financial savings.

It is interesting to notice also that indexation developed not only in financial transactions but also in other important areas. For instance, in 1962 unionized worker wages, the minimum wage, and pensions began to be restated automatically with past inflation. In 1963, non-unionized wages were also indexed. In 1964, accounting practices adopted inflation adjustments for capital and reserves, and for fixed capital. In 1967, delayed tax payments were restated according to past inflation (Landerretche and Valdés, 1998).

Figure 3 clearly distinguishes four different periods regarding the importance of indexation. First, there was the period reviewed so far. Then there was the 1975-1981 phase, with profound deregulation that brought indexation to around 45% of financial savings in 1980-81, a large number by any standard. Then there was another drastic surge in indexation, between 1982 and 1984, whereby indexed instruments increased their share by 30

percentage points. From 1985 (to 2001 as will be clear below) the importance of indexation remained stable between 70% and 80%. These other periods will be analyzed below.

4. (Partial) Dollarization in 1977-1982

In 1974, the military government (1973-1989) put forward a comprehensive economic reform plan that opened the economy and liberalized stringent economic regulations in place. Being socialist in the midst of the cold war, Salvador Allende (1970-73) deepened regulations and expanded the role of the government in many fields, including financial markets. In 1973, with hyperinflation, black markets, and a banking industry that was mainly state-controlled, financial repression was at its height.

The new military government reforms involved freeing prices —including the interest rate—, privatization —including banks—, fiscal consolidation, and trade opening (Edwards and Cox, 1987; Meller, 1996). Macroeconomic stabilization was a key ingredient of economic policy and, to simplify matters, it can be broken down into four phases. In 1973 and 1974, freeing prices and realigning key relative prices were the central objectives. In that period, annual inflation stayed well above 300% per year. Between 1975 and 1977, measures included a strong fiscal consolidation, aimed at controlling money creation, and periodic adjustments in the exchange rate similar to cumulative past inflation, except for revaluations in a couple of occasions intended to break inflation expectations and inertia. Given unfavorable external conditions and the quick economic liberalization, it was quite difficult for the economy to absorb a real exchange rate appreciation in that period. Wages were also indexed to past inflation, although forecast inflation was also sometimes used. This second phase, popularly known as "the shock treatment" to the economy, deepened an ongoing recession in 1975, but reduced inflation: in 1977 it was nearly 90%. The third phase, covering 1978 and the first half of 1979 included pre-announced devaluations (similar to the Argentinean "tablita"). In mid 1979, the nominal exchange rate was fixed. During these two last phases —standard exchange rate based stabilization programs— inflation dropped to less than 10% in 1981 but an important overvaluation accumulated.

In 1974, financial liberalization measures included a substantial decline in reserve requirements and permission to create new non-banking financial institutions which could freely determine interest rates. Foreign banks were also authorized to operate in Chile. In October of 1975, banks, which had been recently privatized, were also allowed to freely set interest rates. Credit control restrictions were also lifted. After interest rates increased impressively, ceilings on interest rates were temporarily imposed, although close to market–clearing levels. The SINAP continued to have restrictions on paid interest rates, hence its importance declined substantially.

During the second half of the seventies, banks' foreign-currency liabilities were treated very differently depending on whether they were deposits or foreign obligations (De la Cuadra and Valdés, 1992). On the one hand, dollar-denominated deposits were liberalized from the outset, maintaining until 1979 a 20% reserve requirement for demand deposits and 8% for time deposits. These rates declined to 10% and 4% in 1980 (and became unremunerated). On the other hand, there were short-run capital controls and substantial foreign resource intermediation constraints. Specifically, there was an unremunerated reserve requirement, together with a minimum maturity and a maximum interest rate for external loans. Banks faced restrictions on the amount of their foreign borrowing and on the rate at which it could increase. The logic behind these measures was to avoid excess external indebtedness and shape a less risky external debt structure.

Regarding capital inflow controls, in 1974 non-financial firms were allowed to borrow from abroad and the capital account became widely open for this sector of the economy. Banks, on the other hand, could guarantee part of these loans and participate in trade-related credit (Labán and Larraín, 1994). In April of 1978, new measures restricted inflows and changed their structure. Loans with a maturity of two years or less were forbidden. An unremunerated reserve requirement was applied to loans with the following rates: 25% for loans with average maturity of less than 36 months, 15% for loans with an average maturity between 36 and 47 months, 10% for loans with average maturity between 48 and 65 months, and 0% for longer average maturity loans. In April of 1980, these restrictions were softened substantially.

Until January of 1978, banks were permitted to borrow abroad only to finance foreign-trade-related credit. Subsequently banks were allowed to loan in foreign exchange for any purpose, but were not allowed to bear exchange rate risk and these type of loans had a limit of 25% of capital and reserves (this limit excluded trade-related credit). In April of 1978, banks were allowed to borrow abroad only a percentage of their capital and reserves. In December of 1978, total bank gross external debt could not exceed 1.6 times its capital and reserves, and there was a "speed limit" for foreign borrowing equivalent to 5% of capital and reserves per month. Later on, in 1979, the debt limit was lifted, although the maximum velocity at which external debt could increase was maintained, despite marginal changes that softened this restriction for smaller banks. Full liberalization finally occurred in April of 1980. It produced a huge increase in external liabilities, although the ban on net positions in foreign exchange continued to exist. Banks' external debt increased from US$660 million in 1978 to US$6.5 billion in 1981 (Edwards and Cox, 1987). These figures represented 34% of private external debt in 1978 and 65% in 1981.

Within this financial deregulation process, indexation was also modified. In 1974, indexation was permitted for all loans with maturities over one year. In 1976, this restriction was reduced to 90 days, and in 1979 commercial banks (not only development banks) were allowed to receive indexed time deposits. In 1981, indexed loans of any maturity were permitted.

During this period, the UF calculation was improved twice. First, in 1975 the basis for restatement became monthly (instead of quarterly) according to last month's CPI. In 1977 the UF began being restated on a daily basis with the day-equivalent portion of last month's inflation. With these changes, the UF became the dominant indexing unit.

Indexation during this period was not only a feature of the financial sector but was also explicitly used in other areas. For instance, in 1975 a tax reform included CPI adjustments for all tax brackets and for balance sheets and profit calculations. In 1978, pensions and wages were restated quarterly, and automatically whenever inflation accumulated 15%

since the last restatement. In 1979, a reform to the labor code established that the floor for wage increase negotiations was to be past inflation (Landerretche and Valdés, 1998).

Figures 4 and 5 show the composition of deposits and loans at December of each year between 1977 and 2002. They also include a second graph with monthly figures for the period under analysis. They include foreign-currency-, UF- and peso-denominated operations. In the 1977-1982 period, while peso-denominated deposits accounted for roughly 60% of total deposits, peso-denominated loans represented close to 40% of total loans. Indexed loans accounted for less than 25% of total loans, while indexed deposits fluctuated between 20% and 40% of total loans.

Despite high inflation between 1977-1978 (inflation was declining, but still averaged about 60%) and domestic financial market freedom, dollarization was not generalized. Moreover, the relative importance of indexation decreased in this period and peso-denominated deposits and loans played an important role, although they continued to be concentrated in very short-run operations. In part, this result could be related to the foreign resource intermediating restrictions mentioned above, although these do not explain why deposits continued not to be dollarized, especially in 1980-82.

One further explanation is the exceptionally high interest rates observed during this whole period. According to Edwards and Cox (1987), ex post real interest rates in pesos during 1978 averaged 18.9%, declined in the following two years to less than 7% but rebounded to more than 20% in 1981. Peso deposits were especially convenient if one believed in the fixed exchange rate system. On the lending side, these same rates plus an average spread of 15% for 1975-81 (Ffrench-Davis, 1982) provided the incentives for dollarizing private sector liabilities. De la Cuadra and Valdés (1992) report average annual real interest rates for 30-day loans of 46% in 1978, 20% in 1979, 11.4% in 1980, and 34.5% in 1981. Part of the demand for foreign resources was channeled through the banking sector that increased its external indebtedness after 1978. It is interesting to notice that the share of dollar-denominated deposits *declined* after 1978. Between January 1982 and January 1983 this

share decreased from 20% to 5%. The share of dollar-denominated loans, in turn, continued to fluctuate around 42% in the same years.

The macoeconomic dynamics observed during the managed exchange rate period are similar to those observed in other Latin American countries that followed similar stabilization programs. Special mention deserve liability dollarization not accompanied pari-passu with deposit dollarization and financed with foreign resources, the prevalence of very high domestic interest rates and a boom in expenditures with increasing current account deficits. Therefore, favorable external conditions, including flows availability, appear to be one important ingredient.

This liberalization process came to a halt in June 1982, when the exchange rate—the icon of the stabilization plan—was finally devalued. Massive banking interventions occurred in early 1983. Various factors help to explain the crisis, where worth singling out are:

(i) An incoherent exchange rate regime together with wage indexation that resulted in a large overvaluation;

(ii) Worsening external conditions, including a significant rise in international interest rates and a substantial drop in terms of trade; and

(iii) An overly deregulated (and poorly supervised) financial system with *de facto* guarantees and self-lending.

Edwards and Cox (1992) claim that no single factor explains the depth of the crisis. GDP declined almost 14% in 1982 and almost 3% in 1983. Inflation quickly increased to 20% - 25% in those years. Interest rates in the financial system began being "suggested" by the authority, ending almost nine years of free interest rates.

To illustrate transaction dollarization, figures 6 and 7 show the composition of the pricing units used in newspaper ads between 1965 and 2003 for homes and automobiles. They

report the percentage of dollar-, UF- and peso- (escudo) denominated ads counted the last Sunday of March of each year in the "Economic Ads" of *El Mercurio* newspaper, the leading newspaper for this type of transactions (annex 1 presents the specific numbers).[1] They show the following:

(i) Pricing in pesos dominated the last 30 years in Chile. This is most notorious in the case of automobiles.

(ii) UF pricing started in 1981 and accounts for approximately 20% of total ads, although more recently it has declined to approximately 10%. It should be noted that almost all mortgage contracts in Chile are UF-indexed, so the result should come as a surprise. The UF has not been used to price automobiles in this type of ads.

(iii) Dollar-denominated prices appeared in the housing market in 1977 and accounted for around 20% of total ads until 1982, with a peak of almost 50% in 1979. In the case of automobile ads, dollarization also appeared in 1977-82, although at a very limited scale (less than 5% of ads).

It is clear from these numbers that the dollar was never the dominating currency for expensive transactions (the exception might be 1979, when bank foreign resource intermediation was liberalized). Casual evidence also shows that dollars were not used for inexpensive transactions either. The UF has had a role for housing pricing since 1980, but it does not represent a substantial portion of the total.

5. Dedollarization, Indexation and the 1982-83 Banking Crisis Solution

One key episode to explain the prevalence of indexation (and non-dollarization) in Chile in the nineties is the resolution of the banking crisis of 1982-83. It also helps to understand the dedollarization process after 1982. As will be clarified below, the UF was the preferred unit

[1] The escudo was the currency issued in 1959 to represent 1,000 pesos. In 1975, the peso returned, standing

to denominate almost all the operations intended to rescue and clean up the banking system. Although this preference even produced some mismatches in the system, it did create a large base of UF-denominated instruments. Furthermore, the fact that the costs of the crisis were paid by the public through a fiscal burden—and *not* through a change in the mechanics of the UF—, produced great confidence in this unit of account (in turn, contributing to the recovery of the financial system).

After the exchange rate depreciation that came with the end of the fixed exchange rate regime in 1982, which even happened during a brief period of free float, but especially during a 40% maxi-devaluation in September of 1982, the exchange rate was managed and indexed to inflation (less a minimum discount). The massive real exchange depreciation that accumulated in a few quarters, larger than 30% between the first quarter of 1983 and the first quarter of 1982, together with the deep recession in 1982-83, put great pressure in the banking system. Non-performing loans increased from 2.3% in December 1981 to 10.8% in March 1983. Credit to bank-related companies (related to the property or management of banks, or "self-lending") accounted for around 20% of total loans. Profitability was –17% in the system as a whole in the first quarter of 1983 (Matus, 1995).

In this environment, radical measures were taken to prevent a collapse of the financial system, including the intervention of a few large banks. Rolf Lüders, Minister of Finance at the moment, explains the rationale behind the initial intervention. Among other things, this policy was intended to avoid making systemic a problem that could be ring-fenced, and, in order to prevent an exacerbation of moral hazard in future behavior, to impose on depositors and borrowers part of the cost (Lüders, 1985).

Clearly, one basic element to successfully rescue and clean up the banking system is to have solid fiscal accounts to start with. This was the case of Chile. For example, in 1981, despite the fact that the new pension had been inaugurated in 1980, there was a fiscal surplus of 2% of GDP. On top of this, there was an increasing demand for long-term

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for 1,000 escudos (1 million *old* pesos).

securities arising from the new private pension system that favored financing fiscal needs after the crisis.

The rescue package involved several fronts and had a cost of about 35% of GDP. The most important ones are described below:

First, it included the intervention and liquidation of 16 banks and financial institutions ("financieras") between 1982 and 1986. The eight intervened and liquidated banks accounted for a combined 17% of total bank loans. The eight intervened and liquidated "financieras" represented 60% of total loans of these intermediaries. Several of theses proceedings were initiated before 1982. According to Sanhueza (1998) the total cost of these liquidations was 10.5% of GDP.

Second, the Central Bank offered a program whereby dollar-denominated debtors were given access to a subsidized exchange rate ("Programa Dólar Preferencial"). Eyzaguirre and Larrañaga (1991) estimate that the cost of the subsidy was 14.7% of GDP. Specifically, the Central Bank defined a special exchange rate that debtors could use to pay for their dollar-denominated obligations. Lending banks would ask the Central Bank for the difference between this exchange rate and the market rate when a customer chose to use the subsidy. Later on, because of the monetary consequences of the procedure, the Central Bank compensated banks by giving them 3- to 5- year UF-indexed bonds to cover larger operations. In 1983, these bonds were traded in the market. Interestingly, both the special exchange rate and the bonds used to transfer banks the subsidy given to debtors were indexed to the UF. Thus, dollar-denominated loan debtors did not pay the full cost of the devaluation, but they did pay a portion. Moreover, once in the program, they were exposed to variations of the UF, not of the foreign exchange, because the special exchange rate was indexed to past inflation. Since the official exchange rate was managed within an index band, the latter did not generate significantly differences. The procedure has some resemblance to the 2002 Argentinean "pesification", although in this case there is a "UFication" of dollar loans —in practice they become indexed— and, critically, the government, not the banks, bears the cost. Initially, the subsidy was approximately

equivalent to 33% of market price, then declined slowly and in 1986 was no longer significant.

Third, support was granted to domestic currency debtors, facilitating rollovers and opening special credit lines. Eyzaguirre and Larrañaga (1991) report that total reprogrammed loans were equivalent to 11% of GDP between 1983 and 1987, and estimate that the cost of the domestic debt rescheduling program was less than 2% of GDP. The rollover programs were targeted mainly to "productive debtors" (i.e., they initially excluded consumer and foreign trade loans, among others) and considered refinancing lines offered by the Central Bank. Debtors could automatically reschedule 30% of their debts, and the other 70% could be financed by banks with resources of their own or supplied by the Central Bank. Most importantly, peso-denominated loans were restructured in UF, with an annual interest rate of 7%, a 10-year term, and a grace period of one year for interest payments and five years for principal amortization. The same conditions applied to dollar-denominated loans, although they continued to be in dollars (which was later tied to the UF under the exchange rate policy). Resources offered to banks to finance the rescheduling were UF + 5% or dollar 10- year credit lines. In order to avoid the monetary effects arising from the drawing of these credit lines, banks were forced to buy with these resources UF + 12% and Libor + 21/8 six-year Central Bank bonds.

In the case of mortgages, the Central Bank also offered UF-denominated credit lines so that banks could reprogram past due loans, extend the term of existing debt and even make new loans. Since in this market debt was originally UF-denominated, the operation did not change denomination. The Central Bank implemented a series of other special lines to support the economy. Almost all these lines were UF-denominated (Superintendencia de Bancos e Instituciones Financieras, 1983b; Matus, 1995).

Fourth, there were important purchases of bank loans by the Central Bank, with an agreement of the same selling banks to purchase them back. In a nutshell, these operations permitted to clean the participating bank balance sheets. Sanhueza (1999) estimates the cost of this program to be 6% of GDP, and studies the incentives it generated and its results. He

differentiates four phases in the program. The last two, in 1989 and 1995, involved changes in the program terms. Between 1982 and 1985, purchased loans amounted to 25% of total bank loans and 20% of GDP. If loans purchased in 1986 and 1987 are included, these numbers increase to 30% and 25%, respectively. In 1983 alone, purchased loans were equivalent to 12.5% of GDP.

In the first phase of the loan purchase program (July 1982 to February 1983), the Central Bank bought loans at par value giving back UF-indexed 10 year bonds with zero interest that paid 5% of the principal every semester. Banks, in turn, were supposed to buy back 5% of the loans every semester. In theory, there was no resource transfer between the Central Bank and private banks. Of course, since the probability of repurchasing was smaller than one, there was an implicit subsidy.

The second phase of this program, from February 1984 to August 1987, was similar to the first, except for a limit on the amount to be purchased equal to 2.5 times the bank's capital and reserves, and included fresh resources up to 1.5 times capital and reserves. The difference between the amount bought and new money was paid with 10-year (15-year later on) UF-indexed bonds. With the new money, banks had to pay back any existing debt with the Central Bank and the rest was to be used to buy Central Bank UF-indexed bonds that were non-transferable and bore a 7% interest rate. In this phase of the program, banks were committed to use any profits to purchase back the loans originally sold. The repurchase of loans had the following conditions: indexed to UF and with a 0% interest rate for the part purchased with bonds, and a 5% interest rate for the portion paid with fresh resources (from the credit lines). Between 1985 and 1987, banks were offered several swap opportunities to limit the mismatch that the program had created because purchased loans were of all types, whereas the new bonds in the banks' balance sheets were all UF-denominated.

Fifth, in an effort to re-capitalize the banking system, a new law enacted in 1985 allowed both intervened and non-intervened banks to raise capital from the public. Sanhueza (1999) estimates the cost of this program to be 2.4% of GDP. Investors would have preferred rights on profits and would receive a special tax treatment if banks used at least 70% of

profits to repurchase loans sold earlier to the Central Bank. Using as collateral the same investment, investors could pay their new shares over 10 years, in which case the investment was UF-indexed and bore a 5% interest rate. Taxpayers were given an even more favorable treatment: with a 5% down payment they could finance the investment with a especial UF + 0% interest rate credit payable in 15 years. There was a ceiling to the amount that could be invested using this latter mechanism.

Finally, banking management rules became more flexible for some time. These changes did not involve important resource transfers and granted more time to recognize in the balance sheet past-due loans or to sell real collateral received in payment for delinquent loans, and a remuneration for voluntary reserves (Superintendencia de Bancos e Instituciones Financieras, 1983b).

Given the size of the quasi-fiscal operations in the clean-up of the financial system, as well as the fact that the UF was the key unit of account in almost all of them, the basis for subsequent development of the financial system was inexorably tied to indexation.

6. Building up financial indexation: 1982-1989

After 1982, monetary, exchange rate and public debt policies actively supported indexation (and non-dollarization) of Chilean financial markets. The Central Bank not only did not fight indexation but accommodated its policy procedures to it. Monetary operations were carried out to stabilize the money market UF interest rate, foreign exchange operations to target the UF/US$ exchange rate, and public debt in domestic markets was largely issued in UF. In turn, the indexation of Central Bank policies helped the liquidity and deepening of indexed financial markets and locked-in the use of the UF as the main unit of account in Chilean financial markets.

In the aftermath of the abandonment of the exchange rate peg in 1982 and the intervention of banks in 1989, there was significant uncertainty about inflationary prospects and it increased to 20-30% per annum. Monetary authorities embraced financial indexation as a

way to cope with nominal uncertainty. From 1982 to 1989, the Chilean economy had no formal nominal anchor. The Central Bank avoided committing to a nominal target. Real indexation in labor and goods markets was extensive, and authorities feared that a strong policy to reduce inflation would create frictions with other policy targets (i.e. international competitiveness and the real exchange rate). From 1983 to 1989, monetary authorities felt comfortable to keep it in the 20-30% range, and pledged a vague goal to bring it down to international levels but in an undefined medium term (Banco Central, 1983,1987). In practice, monetary policy fully accommodated supply shocks and from 1982 to 1989, the annual inflation fluctuated within a range from 12% to 26% a year, reflecting the impact of the variations in the exchange rate, oil prices and indirect taxes.

Indexation offered a way to cope with inflation volatility in financial and real markets,. This section describes the main features of the indexation of Central Bank procedures and other related policies that were implemented in the 1983-1989 period, and their consequences for the development of indexation, as opposed to dollarization, in Chilean financial markets.

a) Exchange rate policy

In September 1982, the Central Bank began to conduct its exchange rate policy as a crawling peg for the Peso/US dollar rate. The rate of pre-announced daily devaluations of the peso were equal to the daily variation of the UF—one thirtieth of last month's CPI inflation—minus a discount to compensate for the rate of inflation of Chile's main trading partners. The discount for international inflation changed in the first two years of the new policy but afterwards it stayed constant at 3.6% per year until February 1991. By the end of 1984 and early 1985, the nominal exchange rate was realigned through a series of discrete devaluations and it began to float within a narrow band of +/-0.5%, which widened gradually to +/-2% in 1985, +/- 3% in 1988 and +/-5% in 1989.

The exchange rate policy became the core piece in the government program to restore output growth, employment and financial normality in the Chilean economy. The goal was

to stabilize the real exchange rate in a competitive level to steer a recovery of output based on net exports and reduce the external imbalances of the economy. There was broad consensus that authorities should not attempt to manage the nominal exchange rate in order to control inflation or influence price expectations, even if the cost was more inertia and volatility on inflation. The 30% real devaluation of the peso in 1984 and 1985 was sustained over the years. The peso weakened further, on real terms, after 1987 as the exchange rate policy accommodated passively to the depreciation of the US dollar in international markets, despite significant improvements in the terms of trade after the fall in the price of oil and the increases in copper and other commodities.

The exchange rate policy was part of a broader structural adjustment program. The plan included a tightening of the fiscal position, a gradual reduction of import tariffs, tax incentives and other subsidies for the recapitalization of private companies and banks, the reprivatization of banks, the divestiture of state owned public utilities, and a program for swapping external debt of the official sector for domestic debt issued in local currency. Reducing inflation was not a priority in the adjustment program.

Monetary authorities were willing to accommodate inflationary volatility and inertia in order to keep stable the competitiveness of tradable goods. This approach shows up in the oscillations of inflation after 1982: 26% in 1985, 17% in 1986, 22% in 1987, 13% in 1988, 21% in 1989 and 27% in 1990. Supply shocks were propagated and amplified through the indexation of prices, wages and the exchange rate, but their overall effect on inflation was offset by substantial levels of excess capacity and unemployment after the 1982-83 recession in the Chilean economy.

b) Monetary policy

Monetary and fiscal policy actively supported the real exchange rate policy. After September 1982, the Central Bank began to follow an active role to steer interest rates, after a period of considerable volatility in the market rates. In the first two years of the new policy, authorities “recommended” an interest rate for the lending operations of banks in

the money market. Of course, in a situation of financial stress, where many banks relied on the liquidity support of the Central Bank, these suggestions were taken very seriously. After 1985, the Central Bank moved toward more transparent procedures to stabilize market interest rates, with a more active use of the pricing structure of its standing credit lines, deposit facilities and open market operations to signal the desired stance for monetary policy.[2]

An important novelty of the new monetary policy procedure was that the Central Bank's "recommendation" was aimed at stabilizing the "real" or UF interest rate, not the nominal peso interest rate. Every week, the Central Bank delivered a signal for the one-month peso interest rate which was flexibly adjusted to compensate for the known and expected variation in the UF in the following 30 days. The "real" interest rate policy was a direct consequence of the "real" exchange rate policy. Nominal peso interest rates had to be adjusted to accommodate changes in the rate of devaluation of the peso, equal to the expected revaluation of the UF minus a fixed discount. Otherwise, there would be arbitrage opportunities between the exchange rate band and the nominal interest rate policy.

Monetary policy targeted internal demand growth and indirectly the current account deficit. If the terms of trade deteriorated, monetary policy tightened credit conditions to slow down absorption and align the international borrowing needs with external targets agreed on with the IMF and international creditors. In the first three years of the new policy, interest rates stayed at an average level of 8.6% in real terms. From 1986 to 1989, real interest rates averaged 4.9%, significantly more expansionary after fiscal policy was tightened and the terms of trade recovered.

The indexation of monetary policy encouraged the surge of an active money market for UF-denominated Central Bank short term bills and bank certificates of deposits, as well as the

[2] The Central Bank established an open window for tap selling its short term debt instruments, the 30-day peso bills (PDBC) and 90-day UF indexed bills (PRBC). The tender rate for the PRBCs was fixed, measured in UF, and adjusted only occasionally according to the desired stance for monetary policy. The nominal interest rates for the PDBC were determined through the Fisher parity, adding the PRBC interest rate to the expected variation for the UF, which was adjusted on a weekly basis based on information from the National

gradual development of a secondary market for medium and long term UF bonds. This left no room for dollarization. The UF-denominated Central Bank instruments provided the basis for the development of Chilean money markets. Monetary operations and the UF policy interest rate supported their liquidity and stabilized their market prices. In addition, it was easier for financial markets to assess the term structure of UF rates than for peso rates, which had to be restated every week.

Between 1982 and 1989, the value of operations on debt certificates in the Santiago Stock Exchange increased by 500%. The value of UF operations multiplied by more than one hundred times, while peso operations declined by 30%. Most transactions involved Central Bank bonds, bank certificates of deposits and mortgage based securities. There were very few issues of private companies' debt in the domestic market, or transactions in the secondary market (Marshall, 1991).

After changes in monetary and exchange rate policies in September 1982, there was a small increase in UF loans and deposits. The big push to financial indexation came after the intervention of the banking system. Loans increased to 60% and deposits to 55% in 1983. Afterwards, they increased slightly up to 70% and 65% respectively. Depositors and borrowers shifted rapidly into indexed contracts as they were already familiar with the UF, prior to the crisis, in 1981, around 20% of advertisements for real estate were quoted in UF, about the same percentage that was quoted in US dollars in the same year. The composition of loans mirrored the liabilities side, as prudential regulation required banks to limit currency mismatches and to measure separate mismatches in pesos and UF, in order to control the CPI-inflation risks.

After 1985, banks were recapitalized through a variety of schemes and sold back to the private sector. In 1986, a new banking act was enacted to address critical issues in the previous crisis, such as limits to concentration of loans, self-lending, required provisions and the empowerment of the Superintendency of Banks and Financial Institutions (Ramírez

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Statistics Institute. Occasionally, the Central Bank established an open window to tap sell other money market instruments at longer maturities, 180 and 360 days, which were also denominated in UF.

and Rosende, 1987). Also, the government guarantee on deposits was dramatically reduced. No differentiation was left between domestic and foreign currency liabilities.

As confidence in commercial banks increased, bank deposits increased at an average rate of 11% per year from 1984 to 1989, above output growth. In the same period, bank lending to the private sector increased at 5% per year, but more vigorously after 1986. A significant portion of the additional funding of banks was used to reduce their external debts through the buy-back programs implemented from 1985 to 1989. Financial dollarization remained relatively stable below 20% of loans and deposits, but with a slight upward trend in the case of deposits and a small downward trend in the case of loans.

Deposits below 90 days were required by law to be denominated in pesos, and checking and other transaction accounts, deposits below 30 days, were neither allowed to pay nominal interests nor to be indexed to the UF. The restriction on term deposits was irrelevant because their peso rates moved in tandem with the expected variation of the UF over the next 30 days. The limitation on remunerating checking accounts and other transaction deposits reflected in the high sensitivity of narrow money aggregates to the monthly fluctuations of the nominal interest rates, and significant fluctuations of base money.[3] In turn, this volatility was often used as evidence of the difficulty of using money targets to conduct monetary policy.

It is important to notice that in Chile, indexation developed in a moderate inflation environment. Homeowners and other debtors usually complained about the UF and the periodic increases of their nominal mortgages and loans, particularly after positive surprises in the CPI. However, the government refrained from intervening or manipulating CPI-indexation. There were proposals to create alternative indexation units, linked to wages or averaged CPI variations. However, there was no tampering with the UF nor indexation of loans. In 1986, the Central Bank created the IVP, based on the six-month moving average for the CPI, and authorized banks to lend on IVP and borrow in the same unit by issuing

[3] The one-month inflationary risk was minimal as the Central Bank provided a weekly estimate of the rate of variation of the UF based on CPI advances from the National Statistics Institute.

long term mortgage based securities. However, the use of IVP in financial dealings has been minimal, their pricing in the market is more complex and their rates tend to be higher.

It is questionable if financial indexation could have survived unscathed had price variations raised to higher levels. Moderate inflation was possible because even after dealing with the banking crisis, there was no severe monetary overhang in the Chilean economy. Unlike other countries, public debt was very low at the time of the external debt crisis and the fiscal budget was in balance despite the significant reduction of social security contributions after the implementation of the new private pension fund system in 1981. As a result, the government was able to deal with the substantial cost of the crisis by issuing debt in the local market and also obtaining new loans in negotiations with the international creditors and the multilaterals. The accumulation of mandatory savings in the private pension funds provided a stable flow of demand for public debt issued in the local market in UF.

c) Foreign exchange controls and restrictions

The extensive use of restrictions to capital outflows also prevented a surge in financial dollarization. Foreign exchange controls eased the task to keep the real exchange rate peg and steer real interest rates into a lower level, more consistent with the cyclical position of the economy and the relief of financial stress in the economy, despite significant uncertainty.

In 1983, after more than one century of inconvertibility of the Chilean peso, with only brief interruptions, the Central Bank had powerful legal and administrative tools to impose limitations and restrictions on foreign exchange operations, to enforce them through supervision and penalties and to prosecute offenders in court. Under Chilean law, the Central Bank was the custodian of Chilean international assets and had the "monopoly" to define their uses. The controls and regulations were partially removed in 1979 to 1982, but in 1983, after the intervention of banks, they were re-imposed.

All sources of foreign exchange had to be informed to the Central Bank and all uses of foreign exchange had to be approved by the Central Bank. Foreign exchange transactions were prohibited unless authorized (Alcalde, 1991). Exporters and others were mandated to convert their foreign currency receipts into pesos through the official or banking foreign exchange market, comprised by the Central Bank, banks and other specifically authorized intermediaries. Residents could purchase foreign currency only to pay for imports and service foreign debt and foreign direct investment, based on the contractual conditions previously registered and authorized by the Central Bank. Residents could not invest abroad through the official market, nor could they prepay foreign liabilities or change any condition on their external obligations unless specifically authorized to do so. Otherwise, they were not granted access to the official market. An unofficial or informal foreign currency market handled all non-customary transactions that were not allowed to go through the official market, but were not prohibited either.

Banks were not allowed to lend domestically in foreign currency, except for foreign trade credits. These restrictions were not prudential but attempted to safeguard the level of international liquidity of the Chilean economy. Indeed, banks were allowed to take deposits in and lend pesos and to link their return to the exchange rate in the official market. Pension funds were not allowed to invest abroad, while other residents, private companies and individuals, moved in a gray area where they could invest abroad but only through the unofficial market.

Compliance with international exchange restrictions was high. Empirical estimates of assets held abroad by residents in the eighties indicate they were relatively small.[4] Information on flows reveals that there was little capital flight before or after the devaluation of the peso, despite significant turmoil in financial markets (Larraín, 1986). Also, the peso traded in the unofficial market at a significant and variable discount with respect to the official rate, indicating that the supply of foreign exchange into this market was effectively restricted. From 1984 to 1989, the discount in the unofficial market

averaged 11% but in some months it climbed up to 29%, when confidence faltered. Throughout the same period, on-shore three-month interest rates on dollar linked deposits were, on average, 360 basis points below corresponding LIBO rates. However, in some months the differential declined to minus 1,000 basis points. After 1991, the discount on the unofficial market peso rate almost vanished as capital inflows became abundant and outflow restrictions were significantly reduced.

The foreign exchange restrictions helped to prevent some of the ingredients that typically lead to dollarization in Latin America. At the time, Chile was in an ongoing process of negotiations with the IMF and international creditors to restructure its external debt and obtain new money. Markets were very sensitive to developments on the current account deficit and the expected results of the rounds of negotiations with creditors. In periods when confidence faltered, non-institutional investors, households and private firms, attempted to shift their portfolios, anticipating changes in the exchange rate policy. However, all the impact of portfolio flows was diverted out of the official market into the "flexible" unofficial market.

On critical periods, like 1984-85, 1988, and 1989, the Central Bank could keep domestic interest rates at reasonable levels despite financial turmoil, because it diverted the impact to the unofficial market. As expectations deteriorated because of economic or political events, the results showed up immediately in the surge of the unofficial market rate and the fall of the dollar linked deposits in on-shore markets. There was no sudden fall on bank deposits or increase in domestic UF or peso rates, which could lead to the typical "peso problem" scenario that paves the way for dollarization. To some extent, capital controls insulated the exchange rate and monetary policy from international portfolio shocks.

Although exchange controls were effective, they were not abused. Monetary policy permanently steered domestic interest rates to keep them above international interest rates, translated into UF through the mechanics of the crawling reference rate, at all times. Authorities were aware that the degree of insulation that provided exchange controls was

[4] Larraín (1986) estimates foreign assets held abroad by Chileans at the time to be no larger than US$4

limited. Over time, the widening of the official/unofficial exchange rate or the on-shore/off-shore dollar interest rate gaps could erode the effectiveness of capital controls. Official international reserves would fall as foreign exchange was diverted to the unofficial market through the overinvoicing of imports or the underinvoicing of exports and similar practices. Also fiscal policy on relatively tight position, at least until 1987, in order to reduce the budget deficit, increase public savings and allow the Central Bank to maintain low interest rates and defend a competitive level for the real exchange rate (Fontaine, 1987, 1991).

e) Debt conversion schemes

Finally, there was an initiative to exchange public and private foreign debt for domestic debt. There were two main programs: debt buy-back and debt-equity swaps. The government and the private sector dedollarized significant amounts of public and private foreign debt through this mechanism.

The debt buy-back program targeted mainly residents who held foreign currency assets in the off-shore markets, outside the official foreign exchange market, and were willing to exchange them for debt issued domestically in UF. Foreigners or residents could purchase Chilean external debt certificates, private or public, of maturity over one year and present them for an exchange into debt issued in the local market, denominated in pesos, UF or US dollars but payable in pesos. Importantly, investors were not granted the right to buy foreign exchange in the official market. The public sector's foreign obligations were swapped for 10-year Central Bank bonds denominated in UF.

The volume of monthly buy-back operations involving official debt was restricted to reduce demand pressures in the unofficial foreign exchange market (and supply pressures in the domestic securities market). A monthly quota was auctioned among local banks to allocate the right to swap public debt, which allowed the Central Bank to capture part of the discount in secondary markets. Authorization to private operations could also be handled to reduce market pressures.

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billion.

The debt-equity swaps targeted non-residents who were interested to invest in the real sector. The Central Bank allowed foreign investors to exchange at almost par value external debt of or guaranteed by the public sector (commercial banks' debt) into a menu of Central Bank bonds denominated in US dollars, but payable in pesos or UF. The swap into domestic Central Bank bonds carried a discount with respect to par value, around 8%, very small if compared to the secondary market discount for Chilean debt, around 40% at the time. Foreign investors could sell the Central Bank bonds in the local market and use the proceedings to finance an investment project, including new ventures, acquisitions or recapitalization of firms. Profits and capital could be repatriated through the official foreign exchange market but only after four and ten years, respectively. After 1992, this restriction was lifted.

As they involved an implicit subsidy, because of the market discount, the debt-equity swap operations were authorized on a case-by-case basis by the Central Bank in order to ensure the investment project was not a scheme, as well as other considerations. The debt-equity swap program was important to allow a reduction of external debt, dedollarize official debt, to deleverage domestic firms and recapitalize banks. However, the program was much criticized by the public because of the small discount applied to the swap and the "fire-sale" of Chilean assets to foreigners.

From 1985 to 1990, the debt buy-back and debt/equity swaps allowed the reduction of US$9.5 billion of the Chilean foreign debt, private and public, one half of total burden at the end of 1984. Almost US$6 billion corresponded to public debt, 60% to debt/equity swaps and the rest to buy-backs. The great majority was exchanged into UF securities.

7. Persistent indexation, off-shore dollarization and nominalization: 1990-2003

After 1990, the newly autonomous Central Bank started a gradual program to reduce inflation to international levels. Despite significant progress toward price stability, financial

intermediation continued to be carried out mostly in UF. Dollarization in the on-shore market continued to be small and it decreased further as a result of interest rate differentials and administrative controls to capital inflows. However, off-shore dollarization increased as domestic blue-chip corporations borrowed more intensively in the international capital markets. Monetary, exchange rate and debt policies continued to be indexed to the CPI. Only after the financial turmoil of 1997-98 and the global reversal of capital flows to emerging markets, domestic corporations rushed to hedge on the forward market. In 2000, there was a surge on the issuance of bonds in the local market that continues today. In 2001, monetary policy was nominalized and set as a fixed target on the peso rates. Financial markets have moved gradually to deal in pesos instead of UF.

Two important lessons stand out of the experience of the Chilean economy in the nineties. First, dollarization or indexation can be very persistent, and it may be not enough to achieve the necessary conditions for nominal stability. There are strong network economies in the use of a currency. Deep-seated practices can lock in indexation (or dollarization) even if their macro fundamentals are gone. Only when the Central Bank abandoned the indexed monetary policy rate, the market started moving toward nominalization. Second, the Chilean experience with a rigid exchange rate is another example of how pegging can hide currency risk and create incentives for dollarization. In the Chilean case, the combination of abundant capital inflows, interventions to restrain the appreciation speed of the peso and an active monetary policy to hold back internal demand encouraged domestic corporations to continue borrowing abroad, accumulating foreign currency risk in their balance sheets. Administrative restrictions on capital inflows helped to contain the incentives to borrow abroad, but were not enough. The development of the forward forex market was slow despite the build up of foreign currency risk, and there were minimal issues of private bonds in the local market. Only after foreign currency risk became evident, after the Asian crisis, both markets developed significantly.

a) Off-shore dollarization

In 1990, the Aylwin administration took power and the Central Bank became autonomous. Low inflation became a priority. The first task of the new monetary authorities was to control and slow down inflation, which was running at 30% a year in an overheated economy. Interest rates were raised sharply, cooling-off demand very rapidly but also attracting significant capital inflows to the country. The Central Bank ended up accumulating significant amounts of international reserves and engaging in massive sterilization.

In 1991, authorities began gradually liberalizing capital outflows, and attempted to reduce capital inflows through administrative measures. Indirect taxes and reserve requirements were imposed to debt inflows. Through the nineties, the coverage of the unremunerated reserve requirements was gradually extended as international capital continued flowing into the country through different types of contracts. First, it only affected inflows related to international debt, then it was extended to foreign currency deposits in local banks, to investments on ADRs in the secondary market, and finally it was extended to certain types of "non-productive" foreign direct investment. There was also a minimum 1-year period to repatriate foreign capital, and Chilean firms issuing bonds abroad had to comply with a minimum risk classification.

The 30% unremunerated reserve requirement restrictions reduced the efficiency of local banks to intermediate in foreign currency as compared to dealings in the off-shore market. As a result, from 1992 to 1997, there was a gradual decline in dollar deposits and loans in the banks, from around 20% to 10% of the total, and banks did not borrow abroad either. From 1992 to 1997, banks' foreign debt remained stable around US$3 billion.

Authorities continued stabilizing the real exchange, but within a wider flotation band. They attempted to restrain the rate of real appreciation of the peso and keep the current account deficit within moderate levels, at 3% to 4% of GDP. The indexation of the reference rate in the exchange rate band continued until 1997. However, the actual indexation of the market

rate declined significantly after the widening of the band in 1992. Authorities introduced other changes to the exchange rate policy. They shifted to peg a basket of currencies, changed the composition of the basket, introduced a 2%/year trending factor for the long term real appreciation of the exchange rate. In 1997, the reference rate was deindexed and linked to the inflation target.

It is interesting to notice that despite these changes, the nominal peso rate was very stable until 1998. From 1993 to 1997, the nominal exchange rate fluctuated within a narrow range around $400/US$. Through all this period, the real exchange rate appreciated consistently. The stability of the peso was the result of two opposing forces: capital inflows pushing up the currency and the Central Bank containing these pressures through regular (sterilized) interventions in the forex market inside the flotation band, and occasional increases in the coverage of unremunerated reserve requirements.

The combination of nominal exchange rate stability and interest differentials provided strong incentives for domestic investors to stay in the local market. After 1992, the Central Bank lowered or eliminated most restrictions to investment abroad, but residents did not use the opportunity to diversify their portfolios. In 1997, pension funds were allowed to invest up to 16% of their portfolio abroad, but they only did 1%.

On the liabilities side, Chilean blue-chip corporations had strong incentives to substitute out domestic UF debt for international debt, while their incentives to hedge the currency risk were small. In the forward market, the peso traded constantly at a discount, to compensate for interest rate differentials, while on the spot market the peso exchange rate remained stable. From 1993 to 2000, the stock of foreign debt of Chilean non-financial private firms went up from US$5.8 billion to US$29.5 billion. The forward market did not develop significantly until 1998. By the end of 1997, Chilean firms had bought less than $500 million in the forward market. The development of the local market for private bonds was minimal until 2000. The only relevant issuer in the local UF market was the Central Bank to sterilize its intervention in the forex market.

In 1998, the Chilean economy was severely hit by the aftermath of the Asian crisis. Terms of trade deteriorated while the current account deficit widened toward 9% of GDP. The peso depreciated and domestic firms rushed to the forward market adding further pressure to the exchange rate. The Central Bank stepped in to contain the depreciation of the peso, selling international reserves, raising interest rates and issuing dollar-linked debt. Administrative restrictions on capital inflows were lowered in 1998 and 1999. After the elimination of the unremunerated reserve requirements on capital inflows, there was a minor increase in dollar deposits and loans, but they remained below 15% of the total. In April 2001, the capital account was completely liberalized and all restrictions to capital flows—in or out—were eliminated.

The combination of negative shocks moved the economy into a recession in 1999. In September of that year, the peso was allowed to float freely and the Central Bank adopted a full-fledged inflation targeting scheme. In the new scenario, Chilean firms moved to change the composition of their portfolios away from foreign currency risk. By 1999, they had increased their long position in US dollars against the forward market in US$5.5 billion. In the first stage, the Central Bank was the main player at the other side of the market through the selling of international reserves and dollar linked securities. Private non financial foreign debt continued increasing until 2000, but after that it stabilized around US$30 billion. In recent years, most of the new bond issues of Chilean firms have been done in the local market. By the end of 2003, the bond market in domestic currency (pesos and UF) was 43% of GDP. The stock of private non financial bonds comprised around 30% of the total. The bulk of the demand for local bonds comes from pension funds and life insurance companies.

b) Prudential regulations

The three main players in Chilean capital markets are banks, pension funds, and life insurers. Banks are required to limit the foreign currency mismatch in their balance sheets. In 1998, the regulation on currency mismatches was perfected requiring banks to hold an open forex position no greater than 20% of their Tier-1 regulatory capital. Banks have no

restrictions to take deposits or lend in authorized foreign currencies. The only exception are housing loans. Regulations on credit risk require banks to consider debtors' currency mismatches as one of the risk factors when provisioning. However, there are no specific or mandatory provisions or capital requirements for mismatches. Deposit insurance is currency-blind in Chile.

By mid-2003, life insurance companies, which are part of the mandatory Social Security system, managed close to US$15 billion. By law, their annuities obligations must be contracted in UF and cannot be denominated in pesos or foreign currency. So to avoid mismatches, life insurers invest close to 80% of their portfolios in local long term assets denominated in UF: mortgage loans and private companies' bonds.

By September 2003, the pension fund industry managed a portfolio of US$42 billion, of which close to 50% was invested in long term domestic bonds, mostly denominated in UF: public and private companies' bonds, and mortgage backed securities. Another 25% was invested abroad, quite different from the situation back in 1997, when their investments abroad were only 1%. Almost 70% of the holdings of foreign currency assets in pension funds have been swapped for local currency through the forward market, and pension funds are the single largest supplier of foreign currency in the forward market, with a short position in forex close to US$7 billion. Prudential regulation establishes a 25% ceiling on foreign assets as a percentage of the funds, and a maximum on the open foreign currency position which depends on the risk exposure of each type of fund.

c) Persistent indexation

In the nineties, monetary policy continued to be conducted through the UF interest rates. However, the independent Central Bank committed to achieve price stability through a gradual and sustained reduction of inflation. Since September 1990, the Central Bank announced yearly inflation targets and then conducted monetary policy accordingly. Until 1999, the speed of disinflation was opportunistic, depending on the size of favorable shocks

on the supply side and exchange rate developments, but every year, the inflation target was below the target for the previous year and every year it was achieved or overachieved. Interest rates were adjusted actively to contain inflation pressures and hold-back internal demand and the current account deficit. Exchange rate considerations were secondary to the conduct of monetary policy. On those occasions, when the band came under pressure authorities preferred to extend the coverage of the administrative measures or adjust exchange rate policy. After 1999, the Central Bank took the permanent commitment to keep inflation within 2% and 4% a year at a two-year horizon, centered at 3%.

The Central Bank continued to issue most of its domestic debt in UF. The fiscal budget was in a surplus so there was no further issuing of domestic government debt in the local markets and only small amounts in the international markets. Starting in 1990, Central Bank issues populated the whole term structure in UF, with maturities going from 90 days up to 20 years. Until 1999, it made no attempt to introduce peso bills or bonds beyond one month.

It is interesting to notice that, despite the sustained reduction in inflation, the success of inflation targets and increased nominal credibility, financial indexation continued to be dominant in Chilean markets. In the banking sector, there was a mild increase in peso intermediation substituting out dollar disintermediation but UF indexation remained constant around 60% of total bank deposits and loans. Most financial operations continued to be conducted in UF. The exceptions were transaction deposits and term deposits for less than 90 days, which could not be indexed due to financial regulations.

Between 1994 and 1997, there was a surge on retail credits, to consumers and small and medium-sized firms. Most of these operations were denominated in pesos and some of them, consumer credits, had a one year or even two years duration. This can be attributed to certain legal restrictions on the maximum interest rates banks could charge to their customers. The maximum rates are higher for peso loans than for UF, which concentrates loans to prime clients and mortgages loans. Also, it is likely that consumers who are less

financially educated prefer the certainty of paying a fixed amount in pesos than floating to the UF.

d) Nominalization of monetary policy

In August 2001, the Central Bank changed its monetary procedures to target a fixed nominal interest rate, while letting UF interest rates move freely to compensate for inflation expectations. The indexation of the interest rate policy target was no longer practical in the context of low inflation and declining interest rates. Now it was more likely to face negative shocks in inflation that could imply targeting a zero or even negative nominal interest rate, destabilizing the composition of bank deposits and the foreign exchange market. Also, due to legal restrictions, it was not possible to fix a negative UF interest rate target if needed, but targeting a nominal interest rate below the inflation target was a feasible way to achieve a negative real interest rate.

Only after this change in monetary procedures, financial indexation started to decline and peso operations started to increase, deposits faster than loans because of their maturity differences. After two years, peso deposits have increased to almost 50% of total deposits, while peso loans have increased more slowly to 35% of the total.

After the nominalization of monetary policy, the Central Bank modified the composition of its debt toward substituting out UF for peso bonds. New 2-year and 5-year peso bonds were introduced to develop the term structure in pesos, while all UF bonds and bills below 5-years were eliminated. Market interest rates show that 5-year nominal bonds trade at an inflationary premium around the long-term inflation target, 3% a year. The private peso market for long term securities and loans is still evolving. New products include longer maturities for consumer credits, up to four years, peso mortgage credits (at floating rates) and the securitization of revolving consumer credits in pesos.

8. Concluding Remarks

The Chilean experience with dedollarization, indexation and nominalization is filled with specific and idiosyncratic details. At the same time, however, it is a rich source of policy experiments and results that may be useful for other countries trying to dedollarize. In these remarks we attempt to summarize this policy experience by describing the factors that appear to be most important to understand why Chile has eluded dollarization.

It is possible to separate these factors into two groups: pre conditions and policy reactions. Within the former group, one should mention—first and foremost—the existence of a well-grounded, credible, and trustworthy indexing unit, the UF. It allowed overcoming the standard lack of confidence of peso denominated contracts in moments in which monetary credibility was far from adequate. Chile was lucky enough to develop this unit several years before the financial market developed. In fact, the UF permitted an early development of financial savings during the 60s. Experience also shows that one indexing unit is enough and that, furthermore, alternatives are most likely redundant (and may not be ever demanded).

A second factor has been the strength of fiscal accounts since 1976. By pursuing a very prudent fiscal policy, the monetary regime has been credible enough, not to always pin down single-digit inflation, but at least to avoid hyperinflation or very high inflation. In an environment of this sort, indexation is a good substitute for dollarization from a private point of view. It may even dominate dollarization considering that it insulates lenders and borrowers from the real exchange rate risk, and not only the nominal risk. Furthermore, the fiscal strength allowed Chile to emerge from the deep 1982 crisis complying with private contracts, at least lessening and not aggravating capital losses in the financial system.

A third characteristic has been the existence of a private, fully-funded pension system since 1980. This structure has allowed financing fiscal needs after the episode of banking distress and has helped develop a financial system with demand for long-term securities and where indexation was a natural way of contracting.

A fourth factor has been the domestic troublesome experiences of the Chilean economy with pegs in a past not so distant. The 1959-62 experience made clear the dangers of dollarization. It was further and dramatically confirmed with the 1982 crisis. In both cases policy makers, market players and the public at large learnt the hard way. The episode of the early 60s did not preclude the 1982 crisis, nor did this other one prevent some overheating and massive capital inflows in the midst of attempts to guide the exchange rate during the 90s. Nevertheless, these experiences probably made policy makers and market players aware of the significant risks of dollarization and shaped the way the financial system was organized after the crises.

Besides helping Chileans to understand the issue, the particularly strong dollarization and dedollarization 1959-62 experience may be interesting, considering that it occurred in a moment when fiscal prudence and the existence of a well-established unit of account were absent. However, policy lessons are closely related to the existing financial repression in this particular episode, hence it may be less useful from today's perspective.

On policy reactions, there a few key elements that one can regard as important steps to avoiding dollarization. First, although it is quite difficult to assess how critical they actually were, but the long experience of the Chilean economy with capital controls probably curtailed the extent of on-shore and particularly off-shore dollarization. The Central Bank was granted the "monopoly" use of Chilean international assets and could enforce controls on residents. Although these controls had both microeconomic and macroeconomic costs (including possibly exacerbating the lending cycle), they almost certainly limited currency mismatches. One important caveat regarding the use these controls is that to implementing them successfully, one requires as a precondition to have legal, administrative and judicial tools to enforce them effectively, which are rarely available.

Second, at times of nominal uncertainty, Chilean policy makers designed its macroeconomic framework and tools embracing indexation and even encouraging it in financial markets. They did not attempted to oppose it legally or through administrative restrictions. For instance, disinflation was on purpose a slow process, the exchange rate at

the beginning and the exchange rate band later on were indexed to inflation (between 1983 and 1999), and monetary policy was implemented using indexed interest rates, even an overnight rate since the mid 90s.

Two particular episodes that show this "respect" for indexation are the way policy managed the 1983 banking crisis and the conversion of external debt of the second half of the 80s. In both cases the authority used the UF as the key unit of account to denominate new contracts, facilitating a massive use of indexation in financial markets.

Of course, there can also be costs behind the indexation-to-avoid-dollarization strategy. One is that indexation develops in several areas, it is extremely persistent and may complicate macroeconomic management and inflation control, the issue of real indexation. Another one is that because of the idiosyncrasies that arise with indexation, financial integration could take longer to arise. Issues ranging from statistical risks to an apparent low carry for the implied risk may hinder the participation of foreign investors in the local market. In any case, this type of problems has to be balanced against the alternatives'.

Third, financial practices as dollarization or indexation can be very persistent, and it may be not enough to achieve the necessary conditions for nominal stability to induce a change in market practices. In the Chilean economy, indexation has continued until today despite the high credibility of the inflation-targeting framework.

Fourth, the Chilean experience with a rigid exchange rate in the nineties shows yet another example on how pegging can hide currency risk and create incentives for dollarization. This type of arrangement precludes the development of the forward forex market and the local bonds market.

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Figure 1: Commercial Banks Foreign Currency Denominated Loans and Deposits, 1955-1965

(% of total loans and deposits)

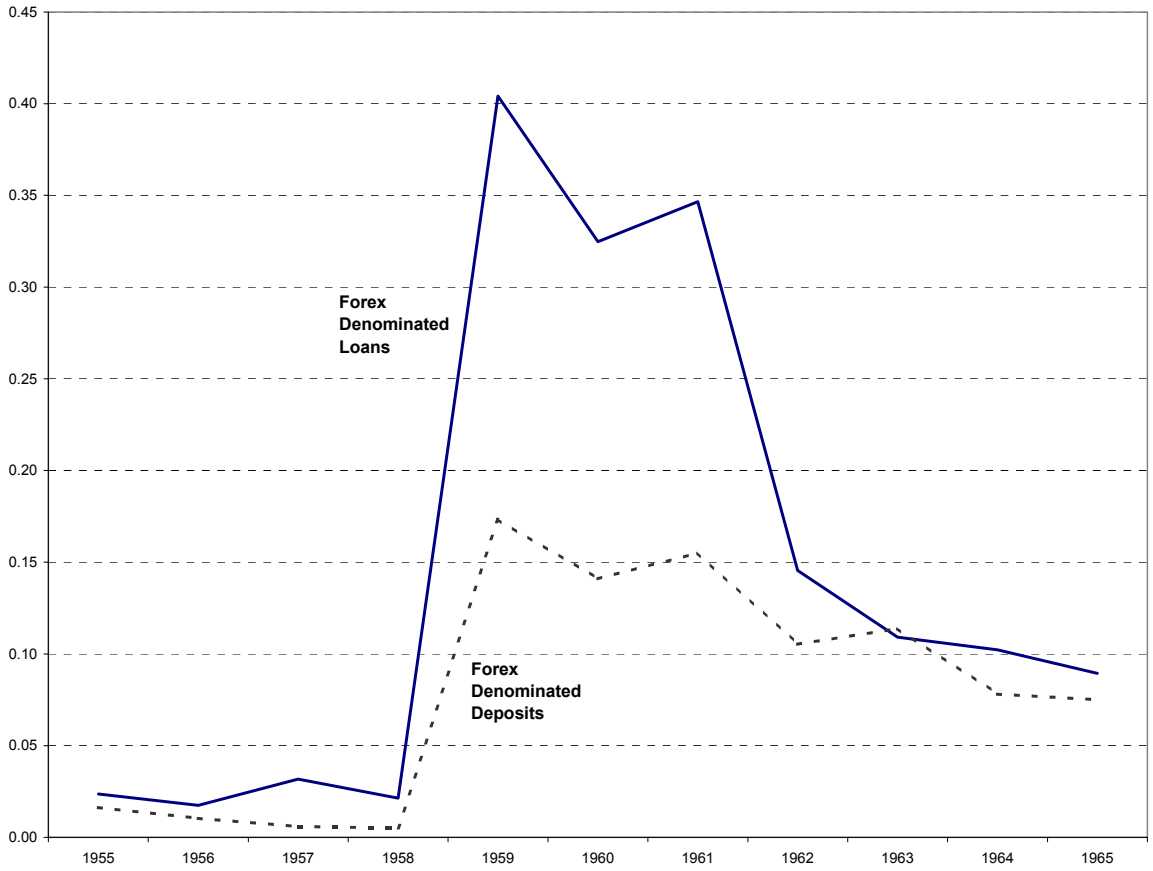


Figure 2: Foreign Currency Denominated Loans to the Non-Financial Private Sector and Commercial Banks Loans to the Non-Financial Private Sector, 1955-1965
(% of total loans and deposits)

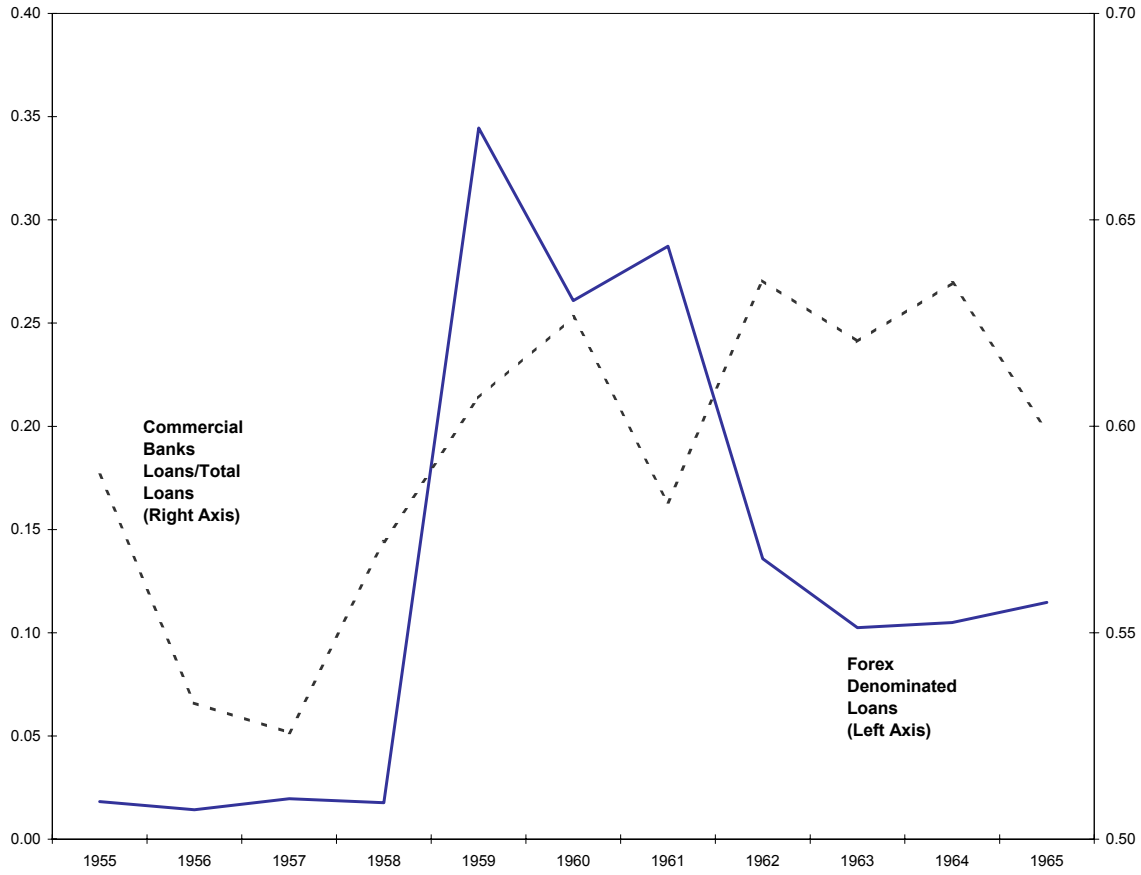


Figure 3: Share of Indexed Instruments in Total Financial Savings, 1961-1990
(% of total financial savings)

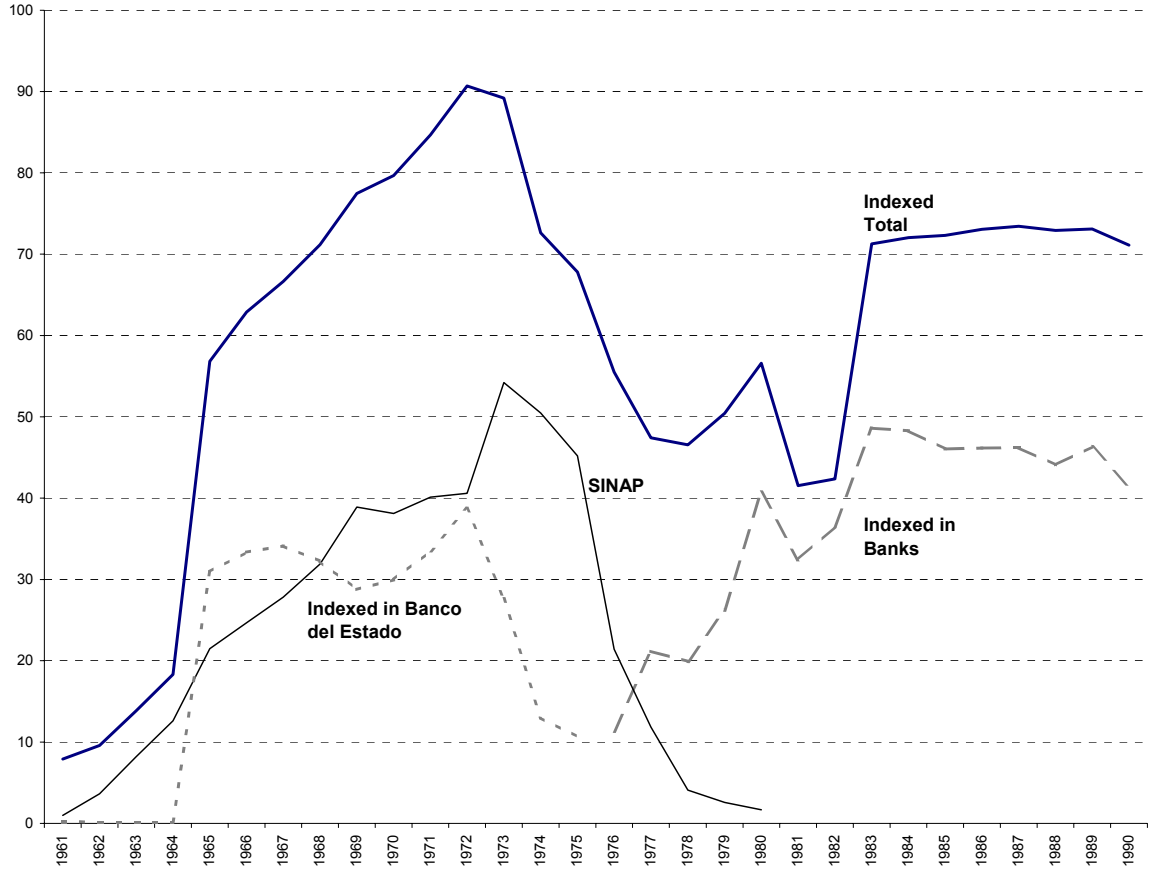
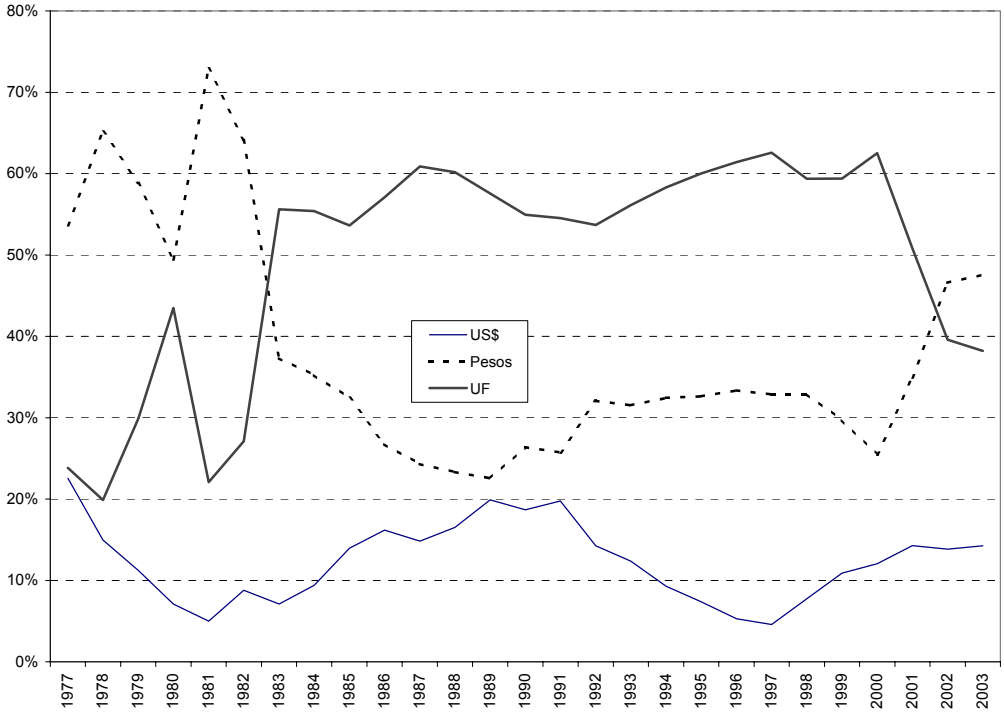


Figure 4: Composition of Bank Deposits, 1977-2003
(% of total deposits)



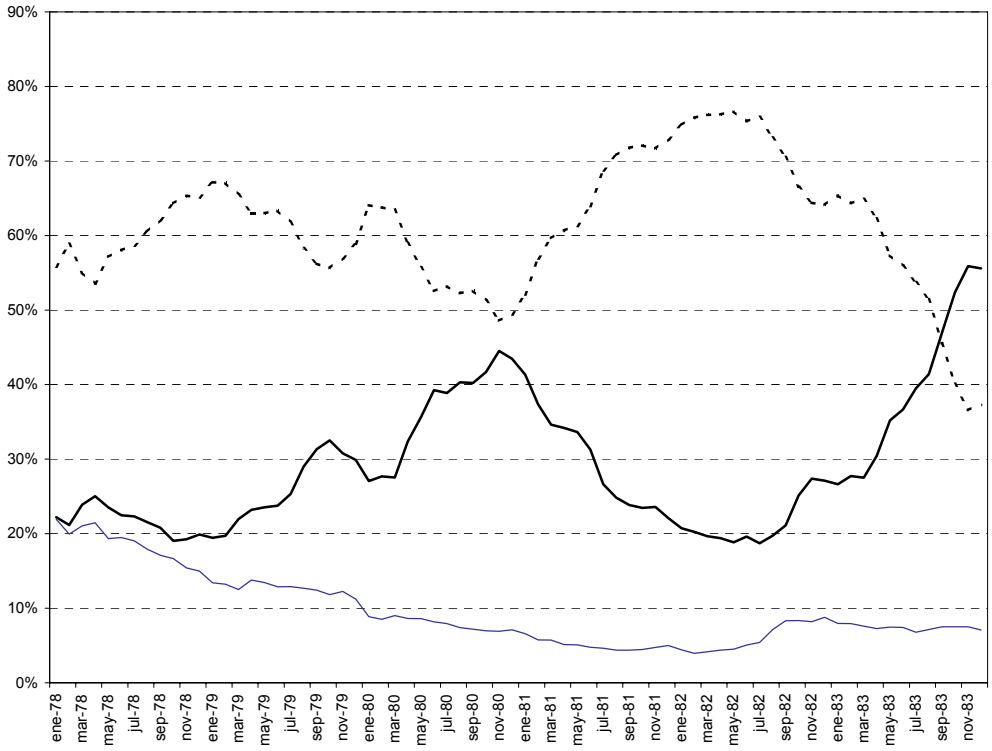
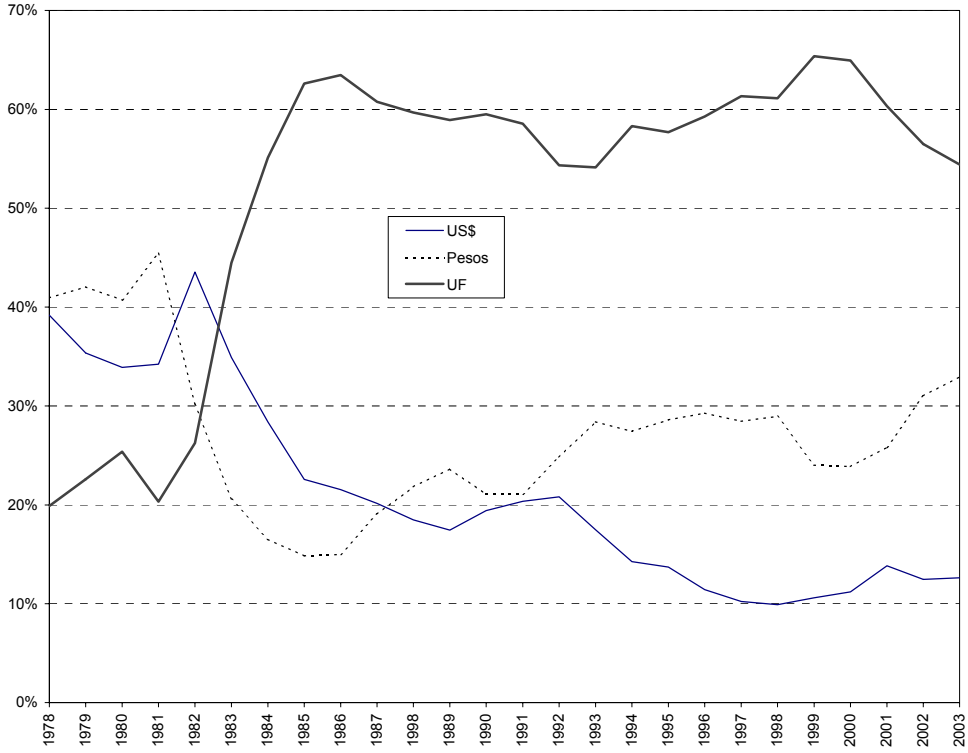


Figure 5: Composition of Bank Loans, 1978-2003
(% of total deposits)



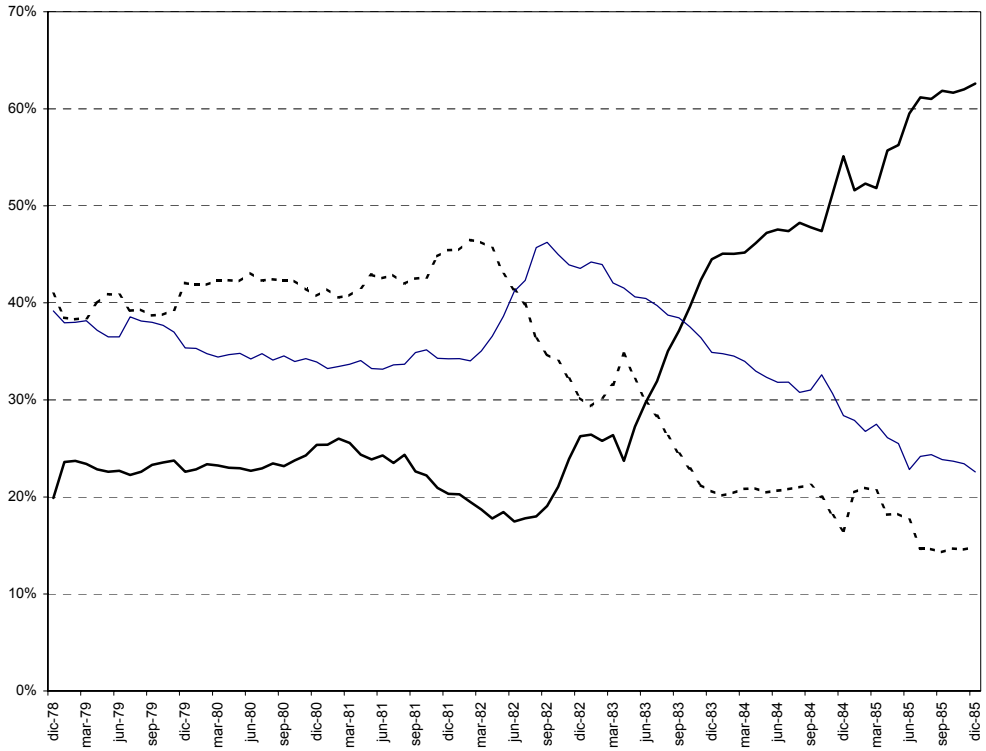


Figure 6: Price Denomination of Housing in Newspaper Ads, 1965-2003
(% of total)

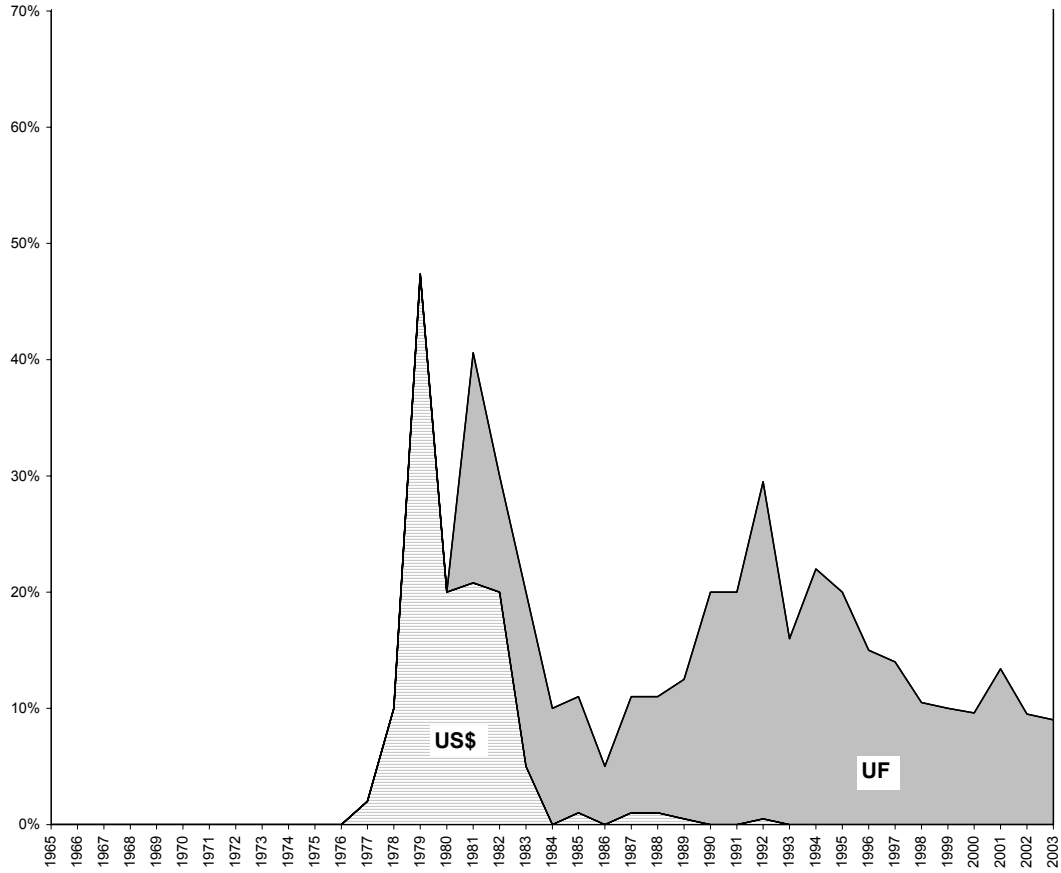


Figure 7: Price Denomination of Cars in Newspaper Ads, 1965-2003
(% of total)

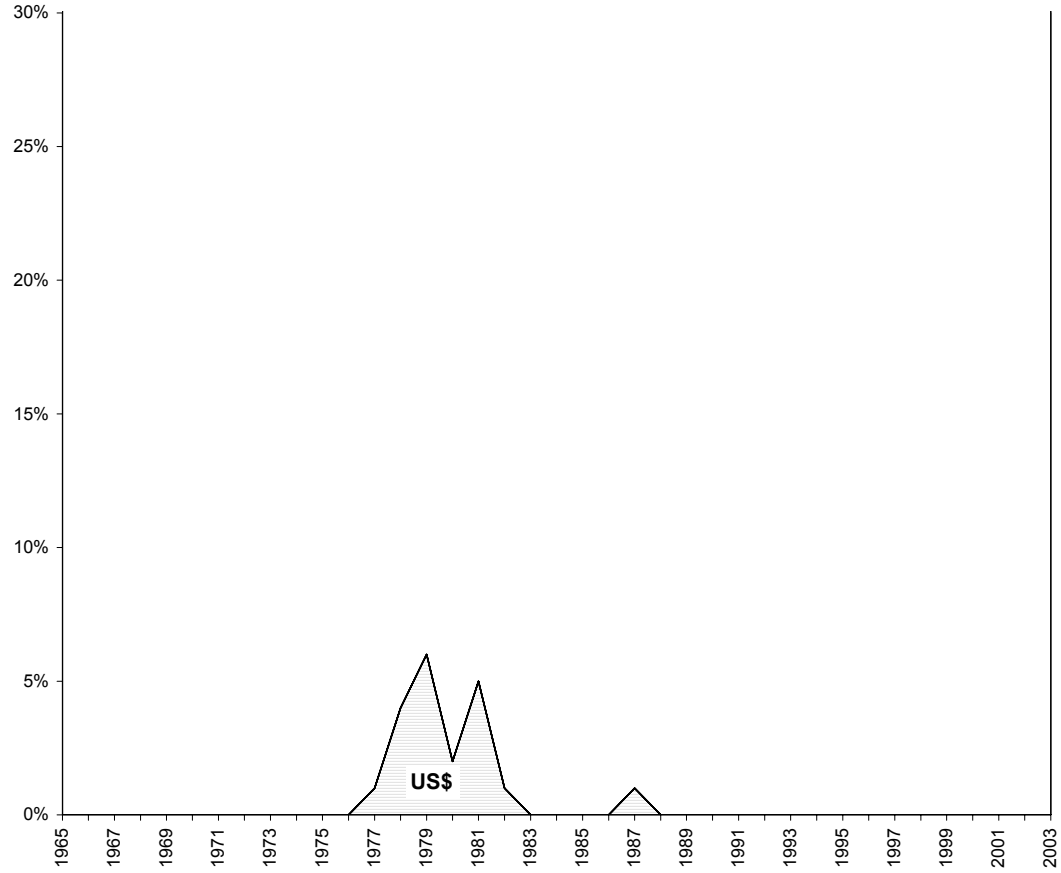


Figure 7a: On-shore/Off-shore US$ rates differentials and the Unofficial Forex Market Premium: 1984-1989

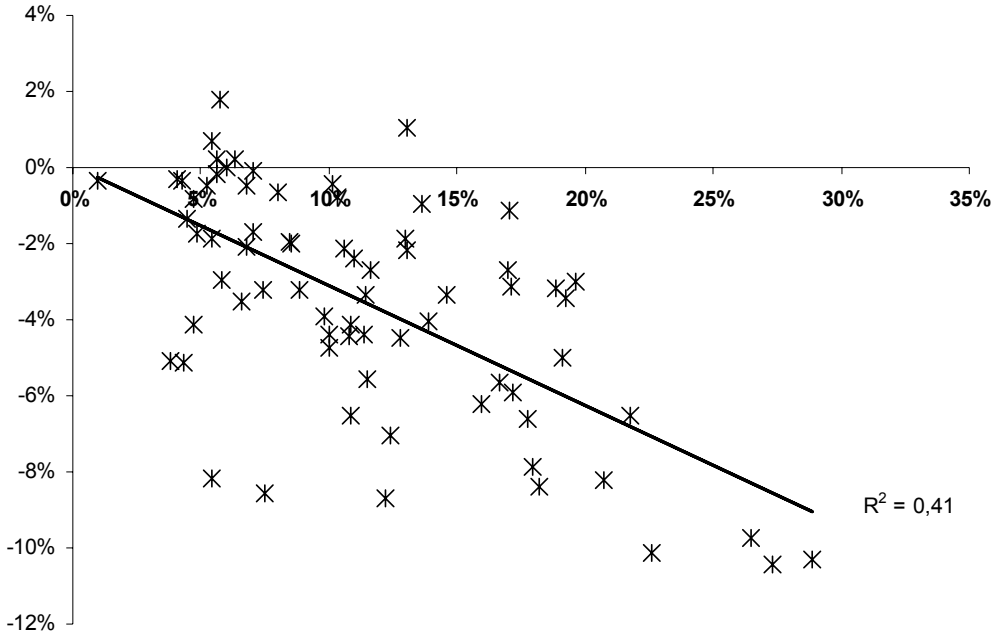
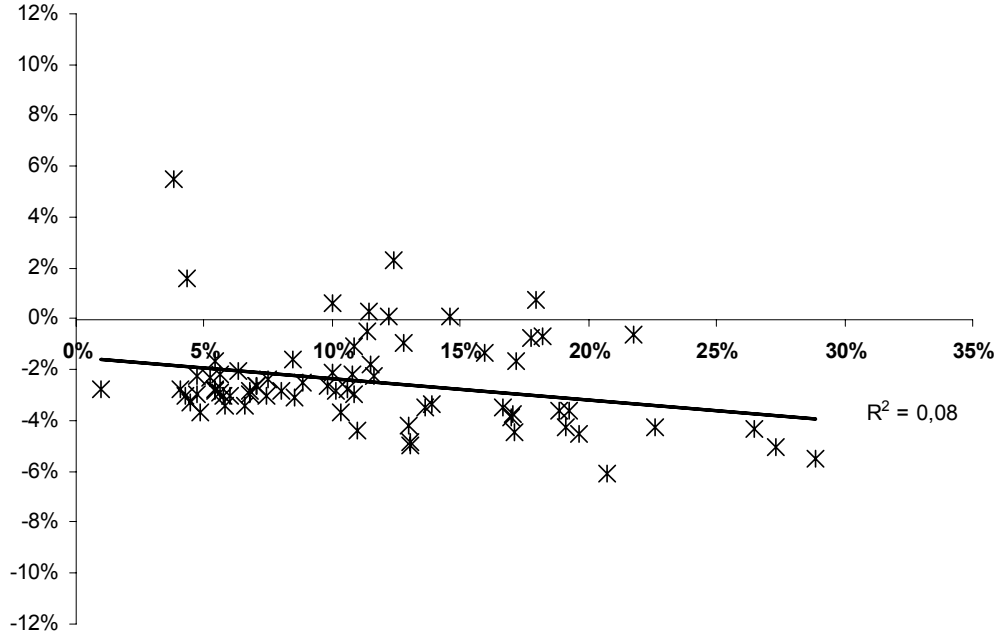


Figure 7b: UF and US$ rates differentials and the Unofficial Forex Market Premium: 1984-1989



Appendix
Table 1: Price Denomination of Housing and Cars in "El Mercurio" Newspaper Ads, 1965-2003

Diario El Mercurio

	Cars					*Real Estate*				
Year	Numeber of Ads	% in Escudos	% in Pesos	% in Dollars	% in UF	Numeber of Ads	% in Escudos	% in Pesos	% in Dollars	% in UF
1965	200	100	100	0	0	800	100	100	0	0
1966	960	100	100	0	0	1860	100	100	0	0
1967	380	100	100	0	0	689	100	100	0	0
1968	1500	100	100	0	0	1495	100	100	0	0
1969	830	100	100	0	0	1088	100	100	0	0
1970	598	100	100	0	0	900	100	100	0	0
1971	935	100	100	0	0	879	100	100	0	0
1972	807	100	100	0	0	871	100	100	0	0
1973	585	100	100	0	0	450	100	100	0	0
1974	880	100	100	0	0	812	100	100	0	0
1975	1260	100	100	0	0	1470	100	100	0	0
1976	1392	0.5	100	0	0	1675	0	100	0	0
1977	1800	0.3	99	1	0	1425	0	98	2	0
1978	935	0	96	4	0	1254	0	90	10	0
1979	900	0	94	6	0	473	0	50	45	0
1980	2090	0	98	2	0	2100	0	80	20	0
1981	2185	0	95	5	0	2463	0	60	21	20
1982	2415	0	99	1	0	1860	0	70	20	10
1983	1430	0	100	0	0	1470	0	80	5	15
1984	1500	0	100	0	0	900	0	90	0	10
1985	2880	0	100	0	0	1950	0	89	1	10
1986	1320	0	100	0	0	1440	0	95	0	5
1987	3960	0	99	1	0	1890	0	89	1	10
1988	4500	0	100	0	0	3010	0	89	1	10
1989	3030	0	100	0	0	2280	0	87.5	0.5	12
1990	2738	0	100	0	0	1200	0	80	0	20
1991	2750	0	100	0	0	1800	0	80	0	20
1992	6120	0	100	0	0	3080	0	70.5	0.5	29
1993	7040	0	100	0	0	2470	0	84	0	16
1994	5628	0	100	0	0	2900	0	78	0	22
1995	6700	0	100	0	0	2600	0	80	0	20
1996	4800	0	100	0	0	4700	0	85	0	15
1997	3800	0	100	0	0	3680	0	86	0	14
1998	6000	0	100	0	0	5500	0	89.5	0	10.5
1999	4000	0	100	0	0	4080	0	90	0	10
2000	4400	0	100	0	0	5600	0	90.4	0	9.6
2001	3680	0	100	0	0	2480	0	86.6	0	13.4
2002	2450	0	100	0	0	3800	0	90.5	0	9.5
2003	6210	0	100	0	0	5250	0	91	0	9