

# **Uruguay: Two Years Of Monetary Policy In Adverse Conditions**

**Daniel Dominioni<sup>1</sup>**

**DRAFT**

**28<sup>th</sup> September 2.004**

## **Abstract**

In 2.002 the Uruguayan economy faced a deep crisis. One of the consequences of this crisis was that the exchange rate regime (a target zone) had to be abandoned and a free-floating scheme was introduced. Thus, the monetary policy had to be redesigned. This paper analyzes the framework in which this new policy was implemented, the problems faced, and the strategy followed by the Central Bank to keep the inflation under control and to regain credibility and reputation. This process should lead to the introduction of an inflation-targeting regime. The main difficulties for the implementation of such regime, and the characteristics this should have in the Uruguayan economy are also the subject of this paper.

*The views expressed in this article are those of the author and should not be attributed to de Central Bank of Uruguay*

---

<sup>1</sup> Central Bank of Uruguay

## **Table of contents**

- I. INTRODUCTION
  - 1. A brief history of the inflationary process
  - 2. The dollarization of the economy
  - 3. The crisis
  
- II. THE MONETARY POLICY AFTER JUNE 2.002
  - 1. The election of a new regime: between a rock and a hard place
  - 2. The program based in the control of money aggregates
  - 3. The challenges of the new policy
  - 4. The monetary base definition
  - 5. The projection process
  - 6. The implementation of the monetary policy
  - 7. The evolution of the monetary policy
  - 8. The development of new instruments
  
- III. TOWARDS AN INFLATION TARGETING REGIME?
  - 1. Are we prepared?
  - 2. What kind of inflation targeting?
  
- IV. CONCLUSIONS

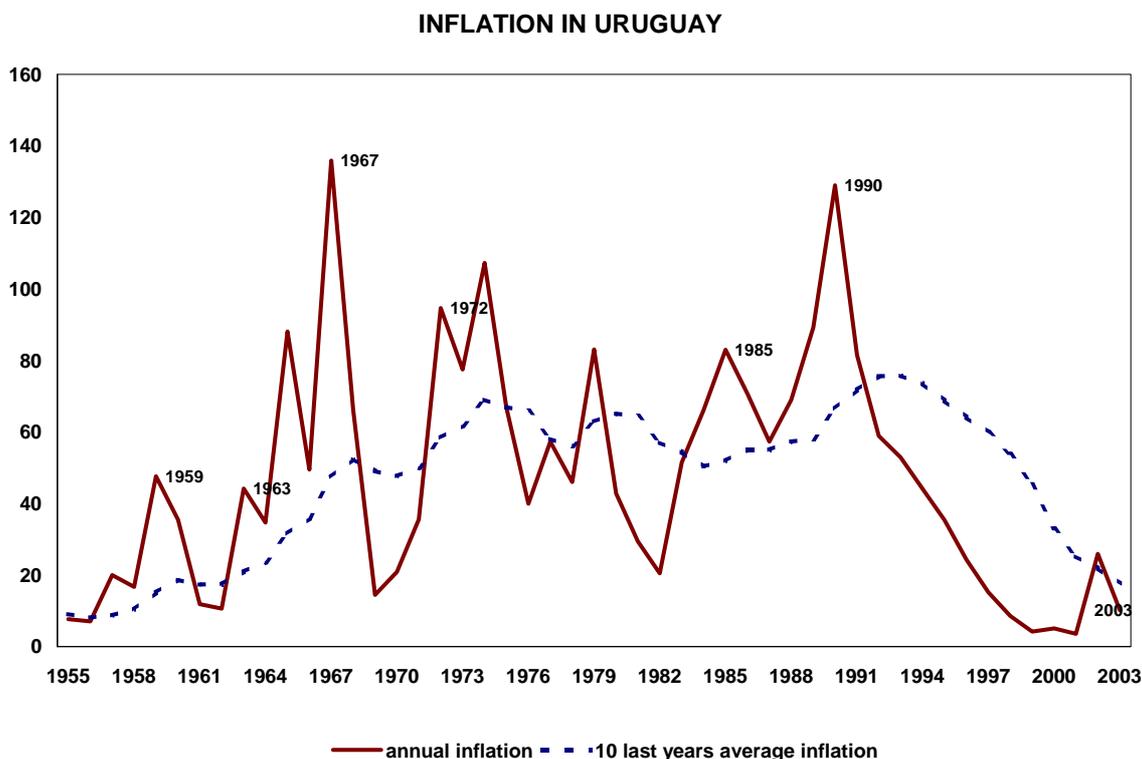
## I. Introduction

In order to have a better understanding of how monetary policy was implemented in Uruguay it's necessary to start by describing three important issues: the inflationary history of the country, its level of dollarization and the deep crisis of 2.002.

### 1. A brief history of the inflationary process.

Inflation has been present in the Uruguayan economy since the middle fifties.

Until the nineties inflation has two main characteristics: a great variability along the years and a strong relationship with the political cycle. It is noticeable that the inflation rate rises up every year after an election (as shown in the graph).



Three stabilization plans have been implemented during this period: in 1968, 1978 and 1990. The first and the second ones were implemented after the inflation reached a historical maximum, placing the country close to hyperinflation.

All of them were based on exchange rate anchors.

--- The 1968 plan was implemented in a framework of a controlled exchange rate and was accompanied by a freeze in prices and wages.

--- The 1978 plan was based on a preannounced crawling peg.

--- A band of flotation was the cornerstone of the one implemented since 1990.

The first plan achieved a partial success, stabilizing the economy for more than two years, preventing the economy from falling into hyperinflation. It lasted while the Government was able to maintain fiscal discipline.

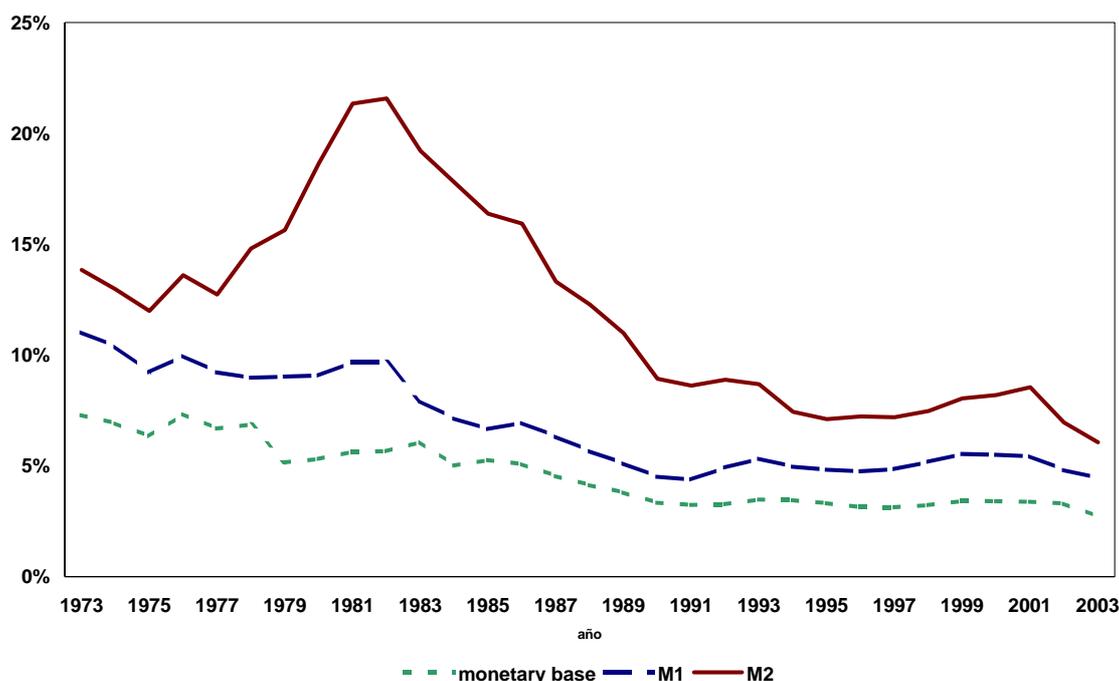
The 1978 plan brought down the inflation rate in 1981, but collapsed in 1982 after strong changes in relative prices, and inconsistencies between monetary and fiscal policy. The crawling peg had to be abandoned, the currency suffered a dramatic depreciation, and the economy – immersed in a deep recession - remained without an anchor for a long time.

The last stabilization plan, instead, was more successful. Like the previous one it was implemented in presence of great capital inflows to the country. It lasted longer and gradually succeeded in reducing inflation. Between 1998 and 2001 a decreasing one-digit rate inflation was maintained, something not registered in the Uruguayan economy in the last 50 years. In 2002 the severe crisis that affected the economy forced the Central Bank to let the exchange rate float freely, putting an end to the use of the exchange rate as a nominal anchor. Although inflation immediately jumped up again, the phenomenon didn't have the intensity and persistence it had had in similar situations in past years in spite of the deepness of the crisis.

## 2. The dollarization of the economy.

As one consequence of the long inflationary history the local currency – the peso – was progressively abandoned in each of its three traditional functions.

### MONETARY AGGREGATES



As can be seen in the graphic the monetary base to GDP ratio and the M1 to GDP ratio are now approximately one half of the values of 30 years ago. In the same period the M2 to GDP ratio fell about 40%.

The aggregates nominated in domestic currency are also very small specially when compared with aggregates in foreign currency. At present about 90% of bank deposits are foreign currency nominated, and this proportion is the same either in current accounts or time deposits. The same happens in the credit side.

There are also a lot of transactions that are foreign currency nominated, being the most noticeable real state, investment goods, and durables.

By the time the crisis exploded all public debt was foreign currency nominated (a vivid example of what Houseman (1999) calls “The original sin”), causing that the depreciation of the currency worsened even more the fiscal sector by increasing the weight of public debt and interest payments.

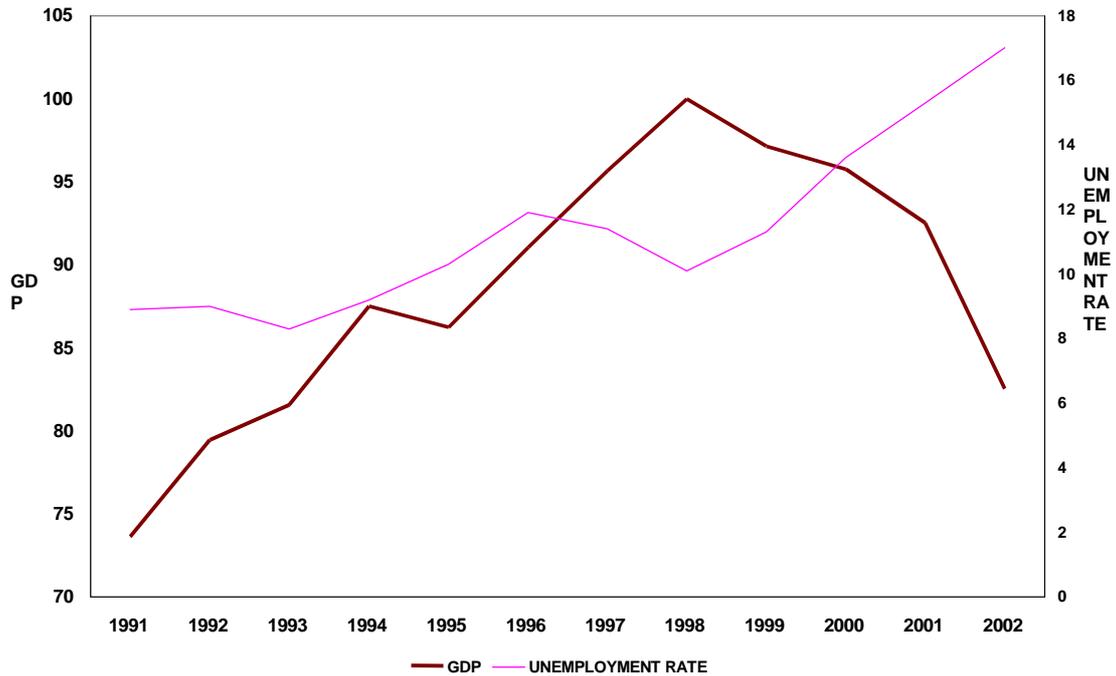
Another consequence of dollarization is that there are no developed markets for peso nominated instruments, which significantly conditioned the effectiveness of the monetary policy.

### **3. The crisis**

During 2002 as a deep crisis developed the Central Bank modify the exchange rate regime.

The reversion of capital flows to the region, combined with some internal vulnerabilities, powered by the financial collapse in Argentina resulted in the worst financial crisis ever faced by the Uruguayan economy.

## GDP AND UNEMPLOYMENT: 1991-2002

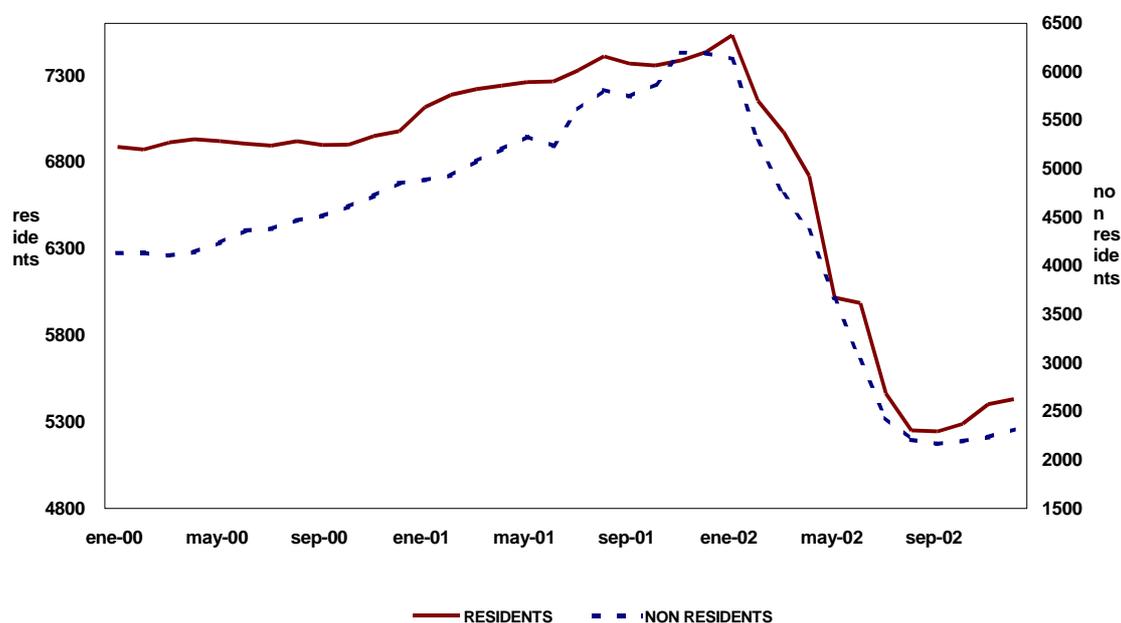


A few selected indicators are enough to show the depth of the crisis.

A sharp decrease in real GDP and an increase in unemployment rate are perhaps the most significant indicators in order to explain the impact of the crisis in the real sector of the economy. Real GDP went down four years in a row completing a decrease of almost 18% in this period. Measured in dollars the 2.002 GDP represented only 55% of its 1998 value. The rate of unemployment rose up to 19.8% in the quarter finishing in November 2.002.

On the banking side a big outflow of deposits (both from residents and non residents), the failure of some of the main domestic private banks and the drain of international reserves were the most relevant features.

## FOREIGN CURRENCY DEPOSITS

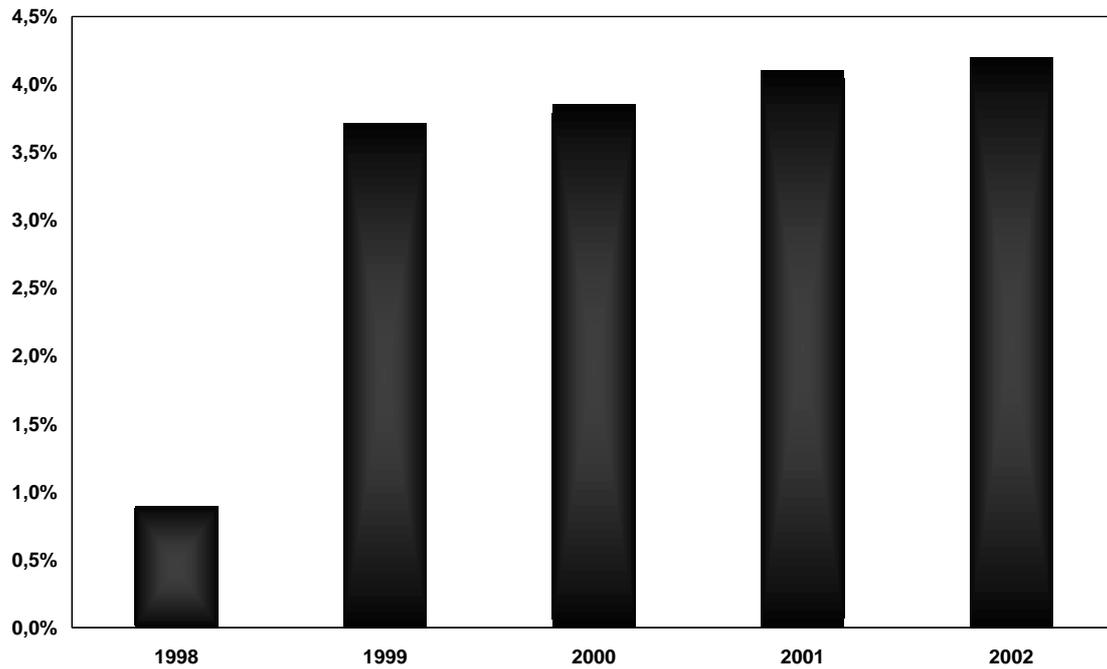


In one year, mostly as a contagion of the Argentinean crisis, more than 40% of deposits left the banking system at the same time that they shifted towards shorter maturities. Banks partially financed this outflow by using their deposits in the Central Bank and as a consequence of this international reserves also diminished from 3100 million dollars in December 2.001 to 711 million dollars by the end of the year.

In July 2.002 the Central Bank ordered for a bank holiday that lasted a week, in order to stop their drain of liquidity while a resolution strategy was set up. At the same time a package of 1.500 million dollars of financial assistance from international organizations was obtained, as a way to backup all sight deposits in the state owned banks. When banks reopened foreign currency term deposits of the two public banks were frozen and reprogrammed to three years, four domestic banking institutions were suspended and a restructuring process started in public banks.

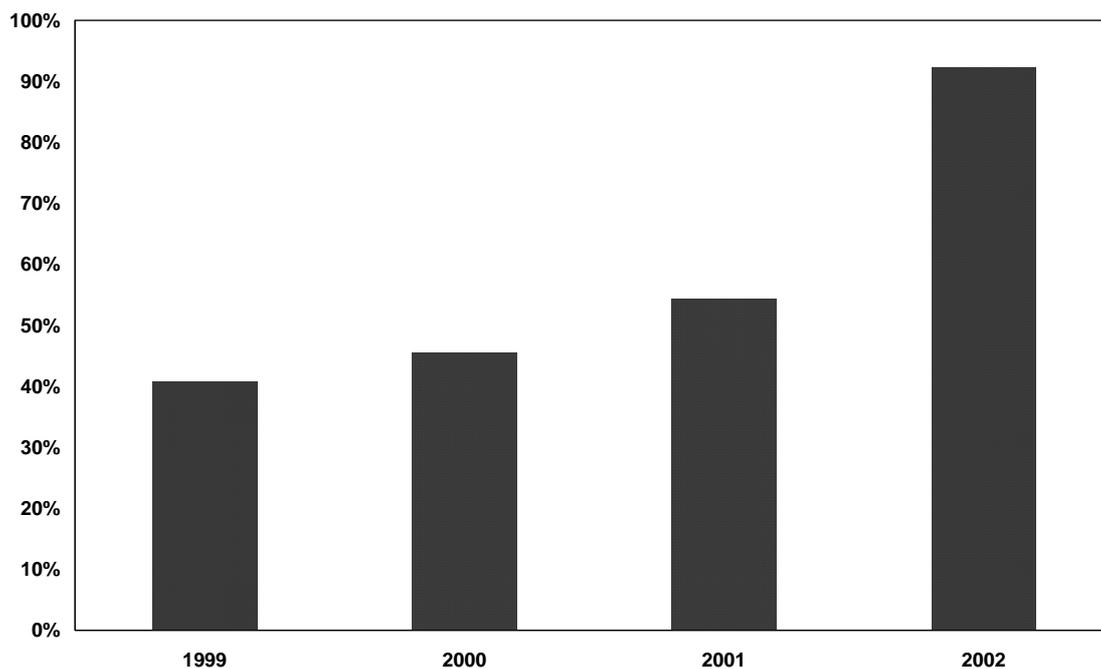
Finally, two major things are noticeable in the fiscal side:

## FISCAL DEFICIT AS A PERCENTAGE OF GDP



First, the decrease in the level of activity determined a growth of the public sector deficit that averaged 4% in four years. This performance was faced by a fiscal adjustment that prevented the deficit to grow further, but that was not enough to ensure sustainability.

## GROSS PUBLIC DEBT TO GDP RELATION



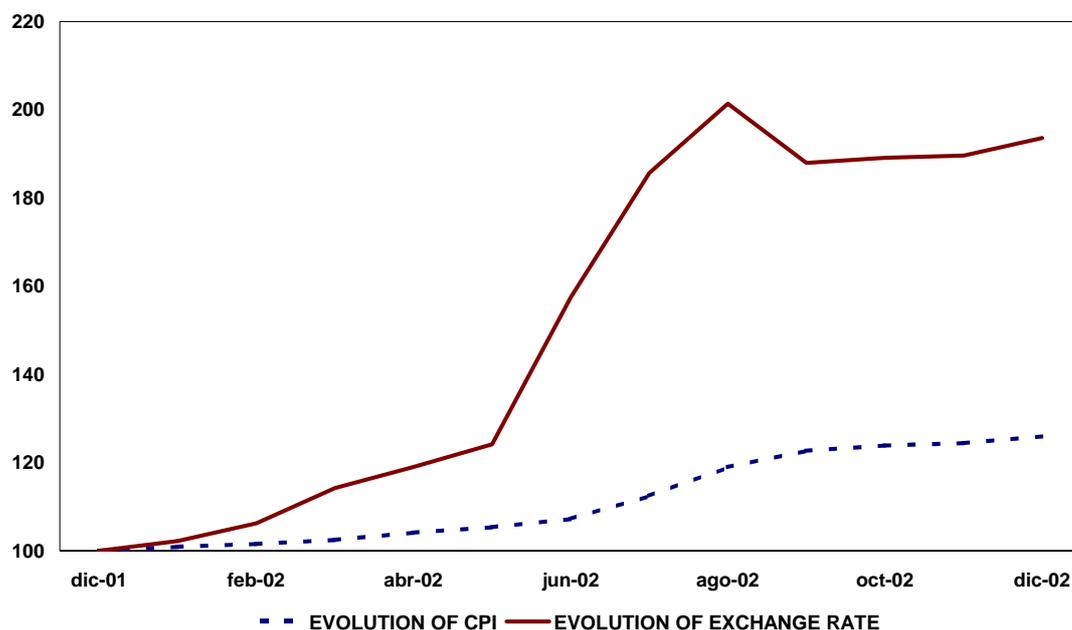
Second: gross public debt rose as a proportion to GDP up to almost 100%. This high value is due to diverse factors. These factors were all related with the crisis: the continued fiscal deficits, the fall of GDP, the debt originated in the assistance to the financial sector and –as the public debt is nominated in foreign currency – the effect of the increase of nominal exchange rate relative to domestic prices.

By the second half of 2.002 it was evident that the band of floatation was close to its end although there was no speculative attack against the national currency– the Central Bank had only sold a few millions dollars as a consequence of the turbulences arousing when Argentina abandoned the convertibility –. International reserves weren't enough to support the exchange rate and it was also inevitable that prices and exchange rate would need a strong adjustment towards a new equilibrium.

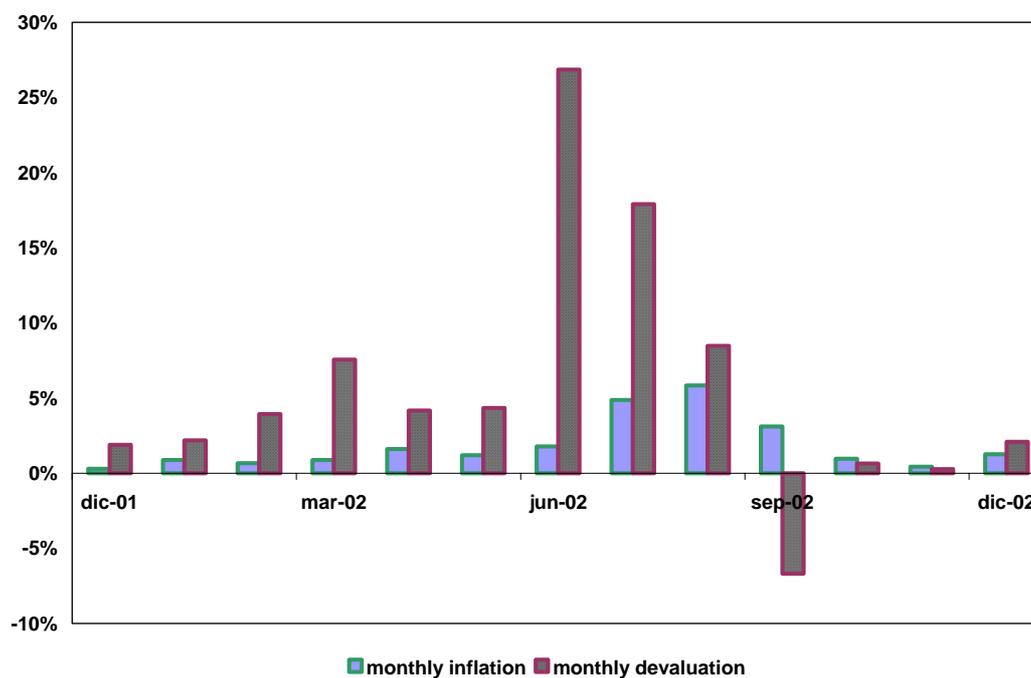
First attempts were made in order to keep the target zone by widening and accelerating the depreciation of its borders. Finally in June 20 the decision of floating freely was taken.

As expected, the exchange rate rose and so did prices, although their increase was lower than in the case of the exchange rate, thus enabling the necessary change in relative prices. Throughout 2.002 the exchange rate rose 93.6% while CPI rose 25.9%.

### EXCHANGE RATE AND CPI (DIC 2.001 = 100)



## MONTHLY INFLATION AND DEVALUATION RATES



In terms of monetary policy one important consequence of the crisis was the decrease in Central Bank reputation: it was not able to maintain the committed exchange rate policy and the financial crisis damaged seriously its image.

This situation, obviously, leads to a very important constraint for monetary policy.

## **II. The monetary policy after June 2.002**

### **1) The choice of a new nominal anchor: between a rock and a hard place.**

In the epicenter of the crisis the new monetary policy had to face the challenge of maintaining the achievements of the stabilization plan, after the inevitable increase in inflation due to the accommodation of relative prices.

The first problem to be solved was the election of a nominal anchor, since the three traditional ones raised difficulties for its implementation in the Uruguayan economy.

According to the characteristics of the economy the exchange rate had always been considered as the most appropriate nominal anchor for Uruguay. Indeed, as seen earlier, it had been used in all previous stabilization plans.

In a small and highly dollarized economy with commercial and financial openness the exchange rate seems to be the major determinant in the mechanism of price formation. It is also easily accountable and is under direct control of the Central Bank. However, at that moment it was impossible for the Central Bank to make a credible commitment to this variable. International reserves were very low, the equilibrium level of the exchange rate was unknown, and there was lack of confidence in the capability of the public sector to honor its debt. Besides, as a consequence of the vulnerability experimented by the country because of the dollarization of debts, the authorities considered that it would be better to go to a regime that enables the economy to reverse the dollarization process. The insistence in the use of the exchange rate as an anchor would perhaps have resulted in more dollarization.

Another option, the interest rate, also presented such serious inconveniences that discarded it as an instrument. The interest rate usually works through channels (through its effect in long term rates influencing aggregate demand, wealth effects, credit channel, etc.) which are closed in the Uruguayan economy.

Thus, for example the small size – or inexistence – of markets for instruments in national currency, or the fact that most of credits and savings are denominated in foreign currency put serious limits to the effectiveness of the interest rate as an operative target.

Once the exchange rate and the interest rate were discarded the only option left was the control of money aggregates, although many of the factors that made interest rate useless were also obstacles for the effectiveness of a monetary policy.

In this regard, the demand for money performs very unstable because of the high degree of substitution between currencies while at the same time the supply side was menaced by the weak fiscal situation. Additionally, the absence of a developed market for financial instruments – there were almost no public debt instruments in national currency – made it very difficult to carry out open market operations.

Besides, the change in the regime puts obstacles to the estimation of the demand for money equation, because it is expected that its parameters might have change endogenously as a consequence of the shift in regime. Variables are not expected to behave in the same way and there are not enough observations of this new behavior in order to make accurate estimations.

## **2) The program based in the control of money aggregates**

The goal of monetary programming is the achievement of a reasonable level of inflation consistent with the objectives of the economic policy and with the legal obligation of preserving the value of the currency stated in the Charter of the Central Bank.

As it is impossible to control this variable directly an intermediate objective on another manageable variable correlated with inflation is needed.

According to different estimations it was found that money in circulation, defined as  $M_1$ , (currency in circulation plus demand deposits) was the variable more correlated with inflation. So, it was defined as the intermediate target.

But this aggregate is not under the direct control of the Central Bank. Consequently the monetary base was chosen as an operational intermediate target.

This option implied a change in the rationale of monetary programming. Given the final objective, the demand for money is first estimated. Once it is projected the monetary base is expanded consistently with this demand and with the money multiplier. In this process the nominal exchange rate is determined endogenously as a result of the evolution of prices and fundamentals of real exchange rate. When the anchor was the exchange rate the process was the other way round; the nominal exchange rate was fixed and the prices were determined after it, according to the fundamentals of the real exchange rate. Thus, the level of prices, and the demand for money determined the level of the relevant monetary aggregate and the monetary base (and also the level of international reserves).

In the new regime there can also be a subsidiary objective of minimizing short-run fluctuations of the nominal exchange rate or short-run interest rate.

Making the public to understand the reversion of the rationale of programming was not a minor problem for the monetary authorities. For decades the public get used to look at the Central Bank using the exchange rate as an instrument. It would be very hard to convince the agents that any intervention of the Central Bank in the exchange market – either to reduce volatility or for its own quantitative goals – was not in order to use it as an anchor again. A communication strategy had to be implemented in order to overcome this.

## **3. The challenges of the new policy**

This policy based on the control of money aggregates was implemented in conditions very far from ideal.

First, at the moment in which the new regime is adopted the Uruguayan economy is in the middle of a deep crisis. Instability and lack of credibility were serious obstacles to any

intent of keep inflation under control.

Second, some structural characteristics of the Uruguayan economy –high degree of dollarization, use of the exchange rate as an anchor for many years – had exacerbated the weight of the exchange rate in the price determination mechanism. All this factors together with the characteristic limitations of a dollarized economy for monetary policy aroused a lot of doubts about the effectiveness of monetary policy.

Third, the programming process was made difficult by some additional obstacles. There were problems for estimating a demand for money because of the previously mentioned change in the behavior of variables, instability and unpredictability of the monetary multiplier, fiscal dominance, and even lack of available information necessary to make estimations or to make recommendation on the use of instruments.

As an example of these problems, in this period the money multiplier showed a high volatility, basically because of the special circumstances of the financial system. As a reaction from the crisis the public modified its behavior, shifting its preferences from time deposits to current accounts, and also increased its preference for currency as a proportion of  $M_1$ . On the other hand banks behaved in a very conservative way in the use of their excess liquidity: the general uncertainty of the economy and the short term funding of banks, determined a very important retraction of credit. All of these circumstances affect the money multiplier in an atypical way, being very hard to predict its evolution when the economy accommodates to a more normal situation.

#### **4. The monetary base definition**

One of the problems to face was the particular definition of monetary base.

The traditional definition, currency in circulation plus bank reserves, is not fit for programming.

This definition presents two problems:

- 1) The existence of a state owned bank (Banco de la República Oriental del Uruguay – BROU) in which the Government makes all its deposits. The BROU has to keep a reserve requirement of 100% of them. If these deposits are considered in the definition of base – such as it could seem logic at a first glance – the money multiplier is highly volatile. Notice that every time the Government deposits in the BROU the banking reserves increases and the other way round in the event that the Government uses them, because these deposits are very important in volume. Moreover, a political decision of the Government of moving its deposits from the BROU to the Central Bank can also make important changes in the monetary base when nothing relevant for monetary policy has happened.
- 2) The Central Bank allows commercial banks to make deposits in the monetary authority for short maturities (overnight, two or three days) at a predetermined interest rate. These deposits are a remainder of a policy focused on minimizing exchange rate volatility during the bands of floatation period. A traditional definition of monetary base doesn't include these deposits, determining that financial institutions could change the amount of monetary base by shifting from these deposits to reserve deposits or conversely, being the “monetary base” out of the control of the Central Bank.

In order to cope with these two problems the Central Bank adopted the following criteria for the definition of monetary base:

- 1) The definition of monetary base should be the one that minimizes the volatility of the money multiplier. So, deposits of the Government, for which BROU has to keep 100% of reserve requirements, are excluded from monetary base. This criterion is equivalent to considering these deposits as if they were sterilized in the Central Bank. As an example if the Government collects taxes and deposits these funds in the BROU there is no change in the monetary base in the traditional definition. In the adjusted definition this implies a reduction of the monetary base.
- 2) Another requirement for the definition of monetary base is that this aggregate should be under the effective control of the Central Bank, because otherwise it would be very complicated to use it as an operational objective. So, voluntary time deposits of financial institutions are added to the definition of monetary base. A shift between these deposits and current accounts in the Central Bank shall not have any effect in the monetary base amount. Nowadays, as the interest rate paid by the Central Bank for these deposits has been diminishing, they can be considered as very close substitutes to demand deposits. Moreover, in practice, they are part of the technical reserve requirements of financial institutions.

So, the definition of monetary base is as follows:

*MONETARY BASE =*  
*CURRENCY IN CIRCULATION*  
*(+) RESERVE REQUIREMENTS*  
*(+) VOLUNTARY TIME DEPOSITS OF FINANCIAL INSTITUTIONS IN THE CENTRAL BANK*  
*(-) GOVERNMENT DEPOSITS IN BROU FOR WHICH IT MUST KEEP RESERVE REQUIREMENTS OF 100%.*

The operational goal is defined for the quarterly average of end-of-the-day values of the monetary base previously defined. This frequency is adopted because the values at the end of the period are very variable and because there is a stronger correlation between averages and prices than between end-of-the-period dates.

## **5. The projection process**

The first step of the projection consists in the estimation of a money demand function.

The specification of the long-run demand for money equation is as follows<sup>2</sup>:

---

<sup>2</sup> For more information about the estimation procedures see: Bucacos and Licandro: "La demanda de dinero en Uruguay: 1980.1 – 2002.4" (2.003)

$$\frac{M_d}{P} = \gamma_0 Y^{\gamma_1} e^{\gamma_2 i} e^{\gamma_3 T}$$

in logs:

$$m_t^d - p_t = \alpha + \beta y_t + \gamma i_t + \theta T_t$$

where :

$m^d$  stands for nominal balances ( $M_1$ ),  $p$  consumer prices,  $y$  real income,  $i$  nominal interest rate and  $T$  one variable that captures the effect of structural changes in the demand for money (such as technological changes or financial innovations).

The equation was estimated using quarterly average of end of month variables. The period begins at 1980.1 and ends at the last value available at the moment of the estimation. Dummy variables were used in order to capture seasonal effects and the impact of the financial run against deposits.

The long-run relationship was estimated first and then an error correction mechanism was used in order to estimate the short-run equation.

All the equations present good results in terms of the usual tests. Although there are some breaks during the period, there is no evidence of structural change and a stable relationship between the variables can be found. Moreover, the parameters are all significant, they have the expected signs and plausible values. The long run elasticity with respect to the product is one, the long run semi elasticity with respect to the interest rate is  $-0.5$  and there is a tendency decrease in the demand for money of 0.7% per quarter. In the short run the public increases its money holdings in 44% of the excess demand for the previous quarter.

Nevertheless, the estimation presents two important problems: first, the standard deviation of the parameters is very high (3.7%): second, the equation is not invertible. This last characteristic has the consequence that more information is needed in order to estimate a good specified price equation.

These limitations are important obstacles for the programming process. The volatility of the projections of the intermediate objective results in errors about the evolution of prices, the targeted variable.

A time series analysis is also used in order to add more information about the evolution of the demand for money and, allowing to check the consistence of the structural projections.

Once obtained the  $M_1$  path consistent with the macroeconomic objectives and assumptions, we have to determine the trajectory of the monetary base compatible with it. For this purpose it is required to make a projection of the money multiplier. This projection has several problems, some of them already mentioned herein.

In summary:

--- The monetary base and  $M_1$  series are available with different frequencies: the first one is on a daily basis – that enables the Central Bank to set targets on average – but

the second one is only available monthly and on an end-of-period basis. Besides, the estimation of the money demand function yields values that are on a quarterly average frequency. Although announcements are made for quarterly data, monthly data are needed for operational purposes. So, and in order to make  $M_1$  and monetary base series compatible, it is necessary to transform  $M_1$  into a monthly frequency and to estimate the relationship between the monthly average and the end-of-the month values for the monetary base. These are not easy tasks because the relationships between end-of-the month and average values are not very stable, this being an important source of errors in the process.

--- The high volatility of the multiplier and the changes suffered, due to the behavior of the public in response to the financial crisis, makes it very difficult to estimate it. The procedure finally adopted consisted in estimating each of the coefficients that compose the multiplier. As these components are very hard to predict the only way to do it is making plausible conjectures about their most probable paths assuming that they will return gradually to their “normal “ values.

Once the multiplier is obtained it is possible to make a projection of the monthly average monetary base. Then, taking into account the intra-monthly liquidity there is a daily projection. This projection is adjusted in order to achieve, when possible, the subsidiary target, the smoothing of the exchange rate path, keeping unchanged the value projected for the month.

## **6. The implementation of the monetary policy**

Once the projections of the intermediate operative targets are ready, the Central Bank publicly announces them one year ahead. There is a commitment for the next quarterly value of the monetary base, and this commitment, together with the projection, is revised each quarter.

To achieve this target it is necessary to estimate the exogenous factors of expansion and contraction of the monetary base (the supply) and then use the instruments available in order to bring the monetary base amount to its desired levels.

In the Uruguayan economy it is possible to identify the following as exogenous factors of monetary base variation:

### *1. Net purchases of foreign currency*

The Central Bank purchases currency with several objectives:

- a) In order to use them to pay its foreign currency obligations: debt amortization, interest payments and other expenditures. Before 2003 the Central Bank purchased foreign currency in order to sell the same to the Central Government.
- b) To the purpose of recovering its foreign currency position, seriously deteriorated as a consequence of the financial crisis.
- c) As a means of injecting liquidity to the market when needed.

Net purchases of foreign currency are not used by the Central Bank as a way of affecting the exchange rate.

## 2. *Credit to the financial sector*

The Central Bank, as lender of last resort, is allowed to make loans to the financial sector in some specific circumstances that are not very common, except for periods of crisis. The loans should be collateralized and directed to solvent institutions that face temporary liquidity problems. It's a discretionary credit; there is not a discount window facility available.

## 3. *Credit to the Government*

This facility is restricted by the Charter of the Central Bank up to 10% of the expenditures budget (excluding interest payments) of the Government and is available through the purchase by the Central Bank of bills or bonds issued by the Government.

## 4. *Use of Government deposits in the Central Bank*

This basically represents the change in the Government liquidity and is the result of most of the current operations made by the Government in national currency. The Government usually runs a superavit on its Peso balance, issues bills in this currency and uses these funds to finance part of its deficit in foreign currency – thus, it has to buy foreign currency. The resulting net flow translates into a change in the balances of the accounts held by the Government in the Central Bank.

## 5. *Deficit of the Central Bank in local currency*

It consists mainly of operational costs and interest payments originated on the use of monetary instruments.

Once these factors are estimated and confronted with the target increase or decrease of the monetary base, it is possible to determine the net amount of instruments that must be issued in order to achieve the target.

The issue of Central Bank bills - called *letras de regulación monetaria* – is the only instrument that has been used till now. The use of repos has been recently announced and it is available as an instrument. Up to now only a few operations have been made.

These bills are issued with different maturities depending on the liquidity cycle. Within the month, this cycle is roughly determined by the different moments when the Government collects taxes or makes expenditures. To smooth this cycle very short maturity bills are issued aiming at the subsidiary target. For the medium run the strategy is as simple as issuing bills when the monetary base exceeds the desired one, maturing in periods where the desired level is expected to be above the actual level. These moments are easily determined as a consequence of seasonal movements in the money demand and supply and the Government income and expenditure cycles.

Up till now the Central Bank has not developed instruments such as a discount window (that could be with a penalty rate), purchases of bills on the market, reverse repos or other operations based on derivatives.

## **7. The evolution of the monetary policy**

The monetary policy was implemented through a learning-by-doing process, given the lack of experience and instruments to work under flotation.

There was skepticism about the effectiveness of the new policy because of the already mentioned limitations it faced. Once the worst turbulences disappeared the main objective of the different policies was to regain credibility by recovering a nominal anchor. As there also was very little knowledge about the mechanisms relating money to prices the only way to regain credibility and generate stability expectations was first to make a strong commitment to one manageable variable, regardless of the accuracy of its effect on the final target.

This policy can be qualified as successful, especially if we consider the moment in which it was implemented. This success allowed the Central Bank to gradually introduce some changes in order to go to a regime implying more commitment with price stability.

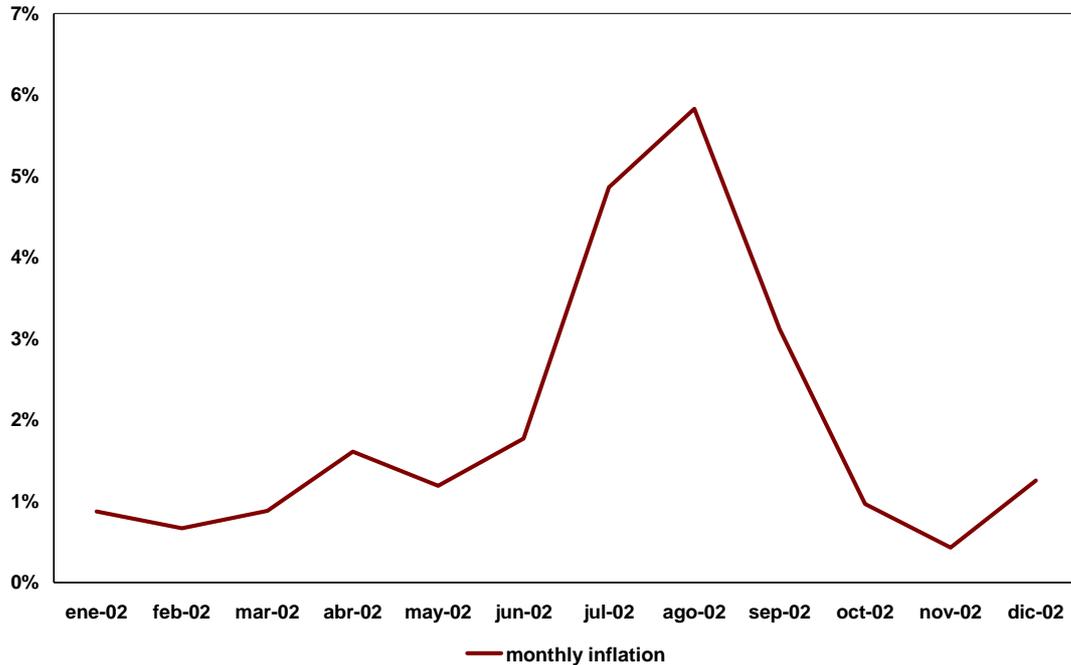
*1. First period: until the end of 2.002. Put the house in order.*

The first period – that goes until the end of 2.002 – can be defined as a “put-the-house-in-order” period. After changing the regime, the monthly inflation rate rose up to 4.9% in July, 5.8% in August and 3.1% in September. As a consequence of this the Central Bank was very concerned about the possibility that inflation kept on growing, so the strongest efforts were to prevent inflation from jumping further. In this context there was not much that the Central Bank could do, other than trying to sterilize the money increase due to Government expenditures. In these months the monetary policy was not very systematical, because of the difficulties arising from the turbulences in the markets, the little knowledge about the functioning of the new regime and the absence of a developed information system that enabled the Central Bank to take the proper decisions at the right time. There was also confusion between the instruments, because T-bills were used both for financing the Government and for sterilizing monetary base.

At the same time a lot of work was devoted to elaborate a new framework in which the monetary policy could be conducted. This included the design of an information system, the estimation of a money demand function, procedures to make projections, and a communicational strategy with the private sector.

Considering the main objective – that is stopping the growth of inflation - the policy was very successful and inflation was kept at more manageable levels as can be seen on the following graphic

## MONTHLY INFLATION



As expected this objective was obtained paying a high cost because rates of interest were very high (in the order of three digits) due to the instability.

Another manifestation of the same thing was that T-bills could be issued only at short maturities, (the average maturity is less than one month).

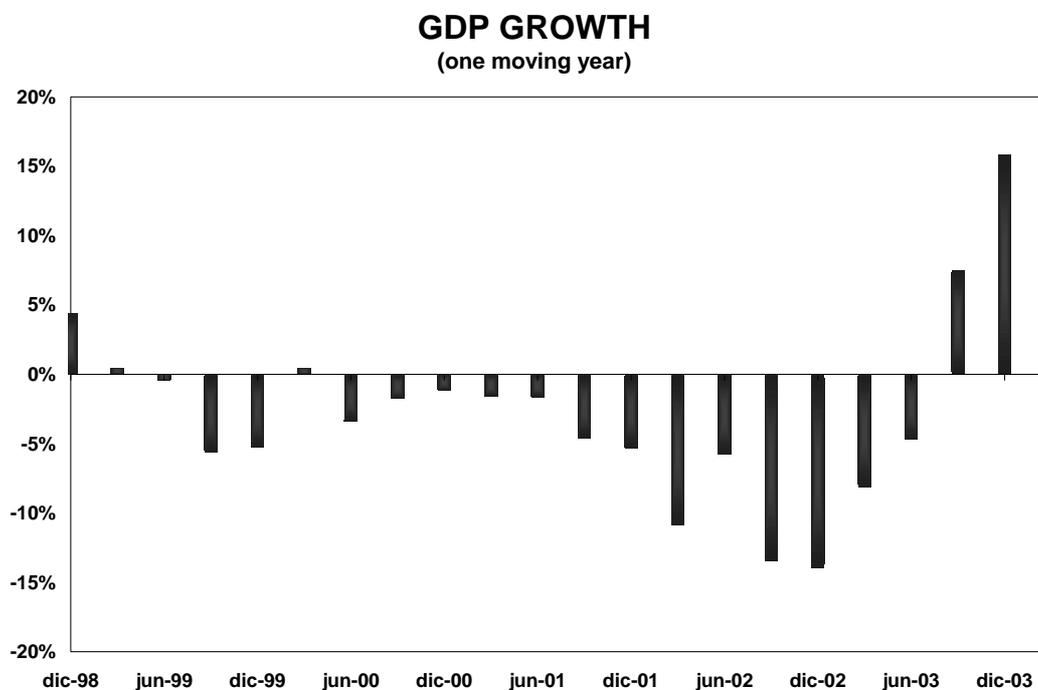
### *2. The second period: 2.003. Commitment to the monetary base.*

Once monetary and foreign currency markets calmed down the Central Bank was able to take a new step: the preannouncement of a target path for the monetary base. This possibility was enhanced by two events that dominated the economy in this period: the renegotiation of public debt and the recovery of the level of activity.

One of the effects of the crisis was that the capability of the Government to honor its debt was seriously affected. So, the Government proposed a voluntary debt exchange, which basically aimed at extending maturities of bonds. This exchange –that took place in May - was successful and as a consequence of it there was an overall sense of relief in the economy, with confidence returning to the markets. This confidence had also important effects on the monetary and financial side. Agents perceived that the Government bought time in order to process the needed adjustments – especially in the fiscal side – that could put its finances in a sustainable path.

Fostered by the gains of competitiveness in the export sector - due to the exchange rate correction and the increase in the prices of some commodities - and helped by the successful debt exchange the Uruguayan economy began to recover by the second half of the year announcing the end of the recession.

These facts created a more favorable environment for monetary policy, and created the conditions for the Central Bank to begin with the control of the objective variables. At the same time, the Central Bank had another goal that was the increase in international reserves that were very low. The reversion of the dollarization process was also a medium-term objective.



By December 2002 the Central Bank was able to announce a trajectory for the monetary base one year ahead. At the end of the quarter, and according to the performance of the inflation rate, the goals could be revised and a new quarter was added to complete a new year ahead.

To review the target it is necessary to evaluate if the deviations between the projected and actual values of the targeted variable are the consequence of permanent or temporary changes in prices, or if they are explained by monetary factors or other shocks. Several tools have been developed in order to get more information about the nature of the variations in the inflation rate. Alternative measures of core inflation (excluding the more volatile goods, excluding extremes, using a principal components method) and time series analysis which try to isolate the trend can be mentioned as the most used by the Central Bank. Once a conclusion on the nature of the deviation is reached, there is a decision of reviewing or maintaining the value for the intermediate operative target. If the monetary authority thinks the deviation from the targeted rate of inflation implies a change on the trend and if this deviation also appears in the core inflation measures the value of the targeted monetary base is reviewed.

During 2003 the most important efforts were made in order to achieve the goal for the monetary base. It was essential to send a message to the public that the Central Bank was able to put an anchor on one nominal variable and so regain reputation. At the same time the Central Bank implemented some measures to improve transparency in the exchange

market and in the monetary policy. A communicational effort was also made in order to facilitate the understanding of the monetary policy mechanisms by the public.

The main measures adopted by the Central Bank to improve transparency were:

- ✓ In May, the Central Bank began to buy foreign currency only according to its needs. This meant that the Central Bank stopped buying foreign currency in order to sell it to the Government; so from then on the Government would have to buy it directly in the market.
- ✓ In June the Central Bank began to distinguish monetary and financing instruments: the only instrument that would be used to drain liquidity would be bills issued by the Central Bank, keeping T-bills only for financing the Government. Up to then T-bills had been used for both purposes, so the instrumentation of monetary policy was not easy to understand.
- ✓ In November the Central Bank began to purchase foreign currency using a system of auctions, announcing at the beginning of the day the amount it was going to buy. This policy was deepened in 2.004, because at the beginning of this year the Central Bank announced the amount to purchase in the whole year and it also makes a similar announcement at the beginning of the each month. It was the first time that these kind of auctions were used in the Uruguayan economy. The purpose of these measures was to make Central Bank's objectives in the exchange market more clear. By announcing (and accomplishing) yearly, monthly and daily its intended purchases the Central Bank is showing to the market that it's not trying to manage the exchange rate. This is reinforced by the fact that the way of purchasing foreign currency is by means of an auction, that is, the Central Bank demands quantities and the public sets the price. This is very important in an economy that is used to see the Central Bank as fixing or managing the exchange rate.
- ✓ The Central Bank also began announcing, at the beginning of the day, the amounts of bills that it would issue in the course thereof.

In terms of communication, the public was informed about the evolution of the intermediate operative target not only through daily publications on the Central Bank website, but also through the preparation of monthly and quarterly reports explaining the evolution of this variable, and its determinants. In the case of quarterly reports, an evaluation of how the goal was achieved and an explanation of the reviews made in the projections for one year ahead were included. This communication strategy also included workshops with private analysts. An inflation expectation survey was also distributed between the most important analysts in the country not only in order to get more information for the evaluation of the targeted variable performance, but also to generate a greater compromise of the society with the goals of the monetary policy.

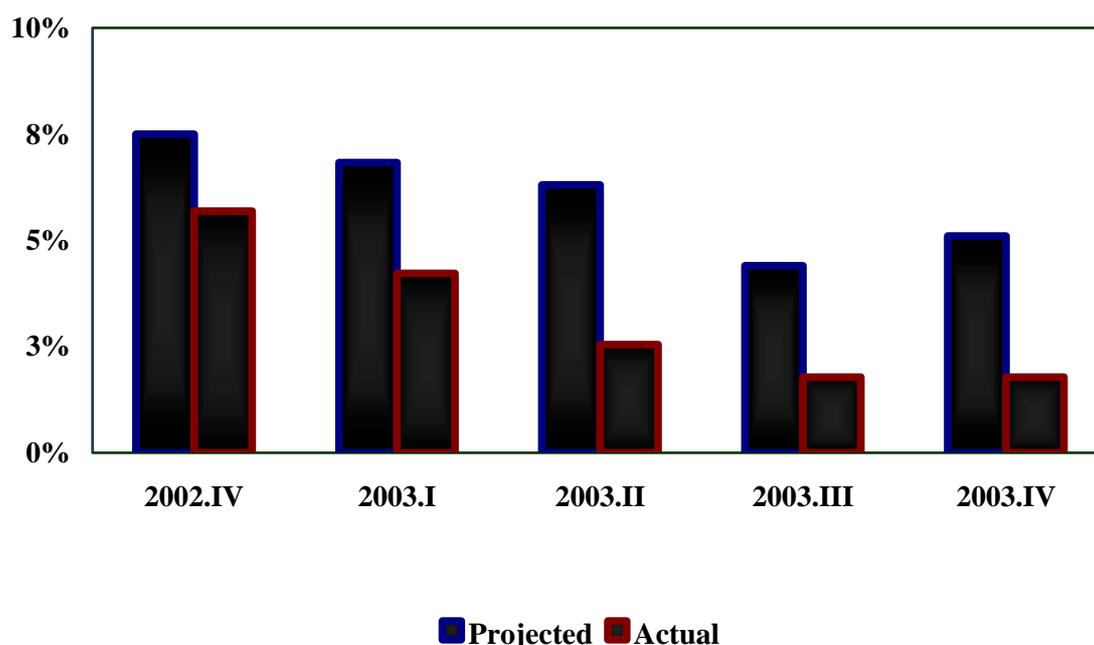
When determining the target the Central Bank authorities evaluated that it would be difficult to stop inflation dramatically without having some costs in term of level of activity and fiscal performance.

So, the program was initially designed to generate a rate of inflation between 17% and 23%.

In this second period the targets on the monetary base were always met, but there was a considerable deviation between the projected and the actual rate of inflation. This deviation

consisted in an overestimation of the inflation rate. This can be seen in the following graphic:

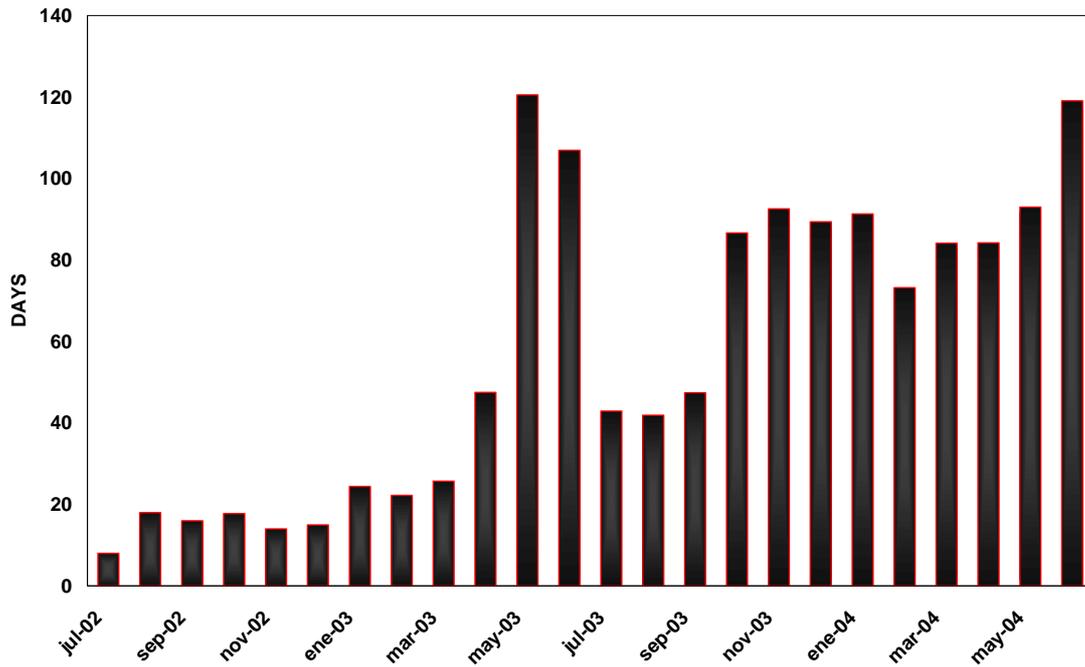
### QUARTERLY INFLATION RATE: PROJECTED AND ACTUAL VALUES



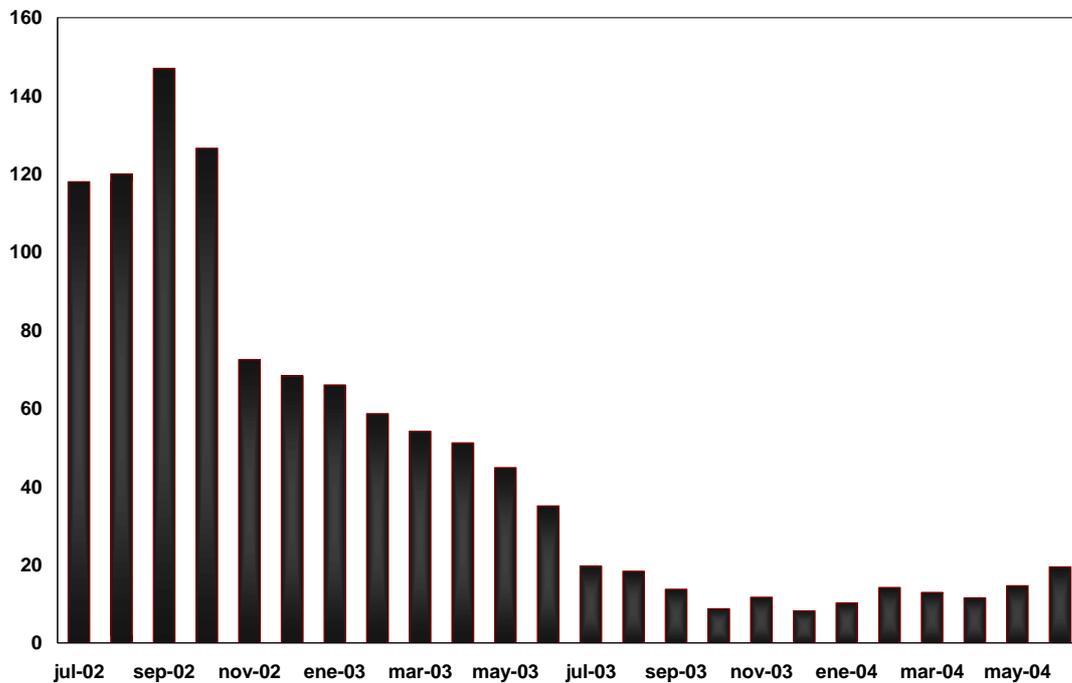
Many reasons could have influenced this result. First, the deep recession and excess capacity existing in the economy determined – despite of the recovery - an absence of pressures from the supply side. Second, the reluctance of the banking system to expand the credit explained why the expansion of the monetary base did not lead to an expansion of M1; in fact, the money multiplier went down instead. Third, more confidence in the economy – especially after the debt renegotiation – determined an increase in the money demand. Forth, the faster than expected recovery of the economy influenced the money demand in the same way.

Another outcome of the policy was that the interest rate decreased and the maturity of the bills increased. As turbulence decreased and expectations of further depreciation of the currency did so, people were more confident in peso-denominated instruments.

### BILLS: AVERAGE MATURITY

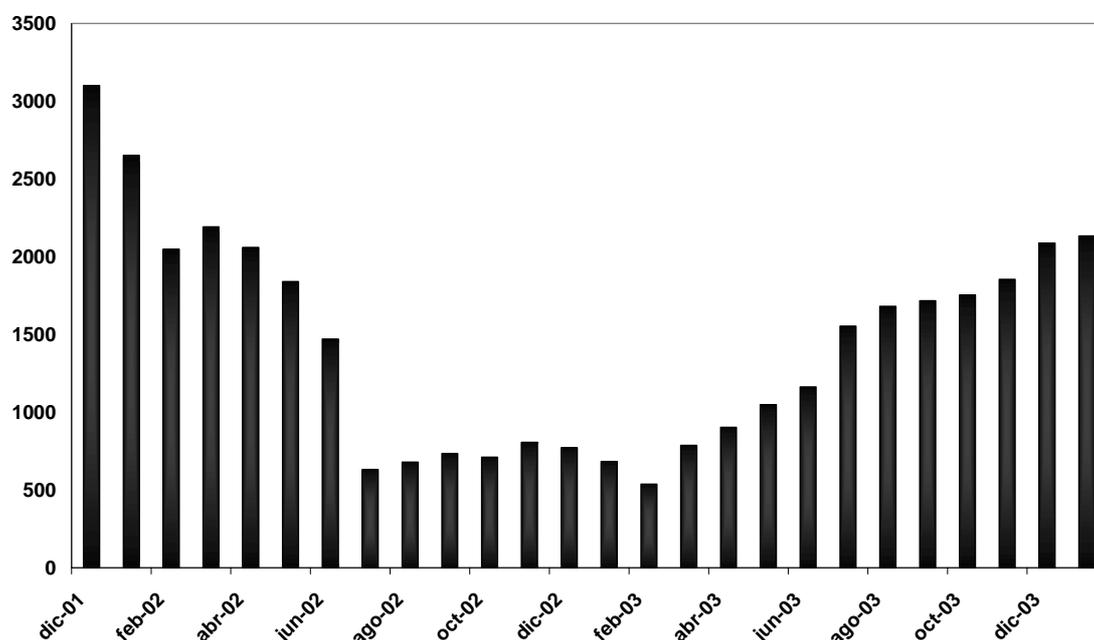


### BILLS: AVERAGE INTEREST RATES



The rebuilding of the stock of reserves was also successful, mostly as a consequence of the return of deposits to the banking system after the exchange and as a consequence of the purchases of the Central Bank in the market. In 2.004 the Central Bank purchased, in net, 354 million dollars – that is more or less 75% of its monetary base.

# INTERNATIONAL RESERVES



The objective of de-dollarization of the economy is more complicated, because it means to reverse a long-term trend and it exceeds monetary policy alone. The traumatic effects that appear every time there is a significant jump upwards of the exchange rate justifies the efforts to increase the use of instruments in national currency.

The free flotation of the currency and the introduction by law of a unit indexed to CPI in which instruments can be nominated are the first steps in this long process.

Additional actions must be taken in other fields, because the preference for dollar-nominated instruments has deep roots in the public.

Thus, regulatory measures, communication efforts, and clear and stable rules that prevent moral hazard behaviors (for example showing clear signs that people indebted in foreign currency shall not receive a “special treatment” if the exchange rate jumps upwards) are some of the possible ways of action in order to face this endemic problem.

The de-dollarization of the economy has another aspect, namely the strong link between the exchange rate and prices, which is an important obstacle for the monetary policy.

*2. Third period: from 2004 until now. More commitment to stability.*

The monetary policy suffered some important changes in 2004. On one hand, last twelve months inflation went down to a one-digit rate, but in the other, there were expectations of inflationary pressures coming soon. The increase in oil prices, the reduction of the output gap due to recovery, and a certain probability that the uncertainty arising from the fact that 2004 is an electoral year could push up the exchange rate, were the main factors behind this expectation.

These facts and the perception that, after the success of 2.003, the monetary situation was under control encouraged the monetary authorities to take measures in order to emphasize price stabilization as the main target.

In order to have more flexibility in the use of instruments the Central Bank relaxed its compromise with the monetary base announcing a range of values for its path instead of a single value as before. But at the same time the Central Bank announced a stronger commitment to the targeted inflation rate.

This change of strategy is also preparing the field for a gradual passage towards an inflation-targeting regime.

## **8. The development of new instruments**

In order to conduct a more efficient monetary policy, the Central Bank must develop new instruments.

Although the goals in terms of monetary base have always been achieved, the question is: isn't there a more cheap way of doing it? The answer is surely yes, because goals were obtained with very simple instruments: when the Central Bank wanted to drain liquidity it issued bills, trying to match their maturity with the moments when there is a need of injecting money according to predictions. The expansion of the monetary base is made by the way of not revolving bills maturing or by buying foreign currency.

This rudimentary process doesn't allow the Central Bank to make a fine-tuning of monetary policy, therefore increasing its cost. Moreover, as the Central Bank keeps on having more objectives related to transparency some of the instruments used for the regulation of the monetary base are not available. For example, as the Central Bank announces the amount of reserves to be purchased in the year and commits itself to this announcement it can't use the buying of foreign currency as a way of injecting liquidity.

Some of the above mentioned structural problems of the Uruguayan economy are the causes for this lack of instruments: the dollarization, the extended use of exchange rate anchors in the past and underdeveloped markets for derivatives or other instruments nominated in national currency.

For the same reason the introduction of new instruments has to be gradual.

In April 2.004 a repo facility was announced with the objective of injecting liquidity for very short periods in order to avoid short-term volatility, but there hasn't been significant transactions yet.

Some other instruments are under study of analysts and authorities of the Central Bank. They are evaluating the convenience of them and the moment for their implementation.

One of these instruments is the intervention of the Central Bank in the secondary markets in order to make open market operations. This could derive in a more fluid and less expensive control of liquidity.

Another instrument that has been evaluated recently is the implementation of forward contracts in the exchange rate market.

Another favorable outcome of the development of new instruments is that it would help to develop markets for the private sector. For example, and regarding forward contracts, if there is a significant spread between the two offers put by the Central Bank (for bid and ask) there will be place for the private sector to put its own offers, leading to a development of this market.

A discount window that would permit financial institutions to obtain liquidity is another subject of study. One discussion is whether the rates of this facility should be punishment rates or not or if this instrument is more appropriate when monitoring interest rate than when monitoring monetary aggregates.

Finally, there is also a discussion as to whether the Central Bank should intervene in the market in order to reduce volatility of other variables such as the exchange rate or the short-term interest rate and doing it explicitly. The examples of other countries that use (and publicly announce it) some amount of its international reserves to prevent the exchange rate to depart significantly from previous values – this governed by an explicit rule - deserves attention.

### III. TOWARDS AN INFLATION-TARGETING REGIME?

#### 1. Are we prepared?

Perhaps the most challenging and important alternative is whether the Central Bank is ready for setting an inflation-targeting regime or not.

As Calvo (2.000) points out one of the risks of inflation targeting is that, as the authorities are allowed to use a whole battery of instruments to achieve their inflation objectives this can conduct to serious credibility problems. So, “a non credible policymaker may have to tie himself firmly to the mast to get any results”. This has been the strategy the Central Bank has been following since it let the exchange rate float freely.

Up to now the Central Bank has been very cautious in announcing its objectives. In April 2.004 it strengthened the compromise with the target of inflation and so therefore, relaxed the compromise with the operative intermediate target, but it didn't announce that it was the beginning of an inflation targeting regime. Instead of this it announced that “the Central Bank will persist on looking with attention to the conditions of the monetary market and macroeconomic context, having, in the proposed scheme, more possibilities to adopt the measures it considers adequate every time prices diverge from the desired path.”

Inflation targeting can be viewed not as a means of stabilizing the economy but as a means of preserve and enhance stability. In other words, in order to develop a successful inflation targeting scheme the economy should have been stabilized before. Inflation targeting was implemented mostly in stable countries and helped them to be more stable. It works like a fine-tuning.

Thus, Uruguayan economy should have inflation under control – that is, very close to its optimal social level - before implementing an inflation-targeting regime.

Another important requirement for the implementation of an inflation-targeting regime is the institutional framework.

All the authors emphasize the importance of issues such like independence of the Central Bank, transparency, accountability, strong commitments, clear rules, building of credibility, etc. All of these issues are essential components of an inflation-targeting regime.

Although many progresses have been made in recent years, Uruguayan institutions are not still fully prepared to set up an inflation-targeting regime. The building of these institutions requires time and a degree of social consensus that are very important to keep an economy stable.

The Charter of the Central Bank that was approved in 1995 introduced some institutional advances. It sets limits to the ability of the Central Bank to finance the Government (this restriction was tightened by another law passed in 1997), set the conditions for giving

assistance to the banking sector and established the defense of the currency as one of the objectives of the Institution.

## **2. What kind of inflation targeting?**

Several authors have remarked (Bernanke and Mishkin (1997), Green (1996)) that inflation targeting is a framework, not a rule, so the adoption of an inflation-targeting regime allows a diversity of ways of implementing it, not only regarding its instruments, but also regarding its objectives.

### **Objectives**

Thus, the first question is whether an inflation-targeting regime should be a strict inflation-targeting regime or it should allow some room for other short time stabilization objectives, such as output.

In a country like Uruguay, perhaps, inflation targeting should be defined in a strict sense, that is with the only objective of achieving the optimal inflation rate. As was seen before the Uruguayan economy is very dollarized. In fact, most of the credit given by financial institutions is nominated in foreign currency. This high degree of dollarization of Uruguayan economy makes it very difficult to use the traditional instruments of monetary policy (such as interest rates or monetary aggregates) in an effective way. So, if it is difficult to be effective with nominal goals, more difficult should it be to affect the level of output, even in the short run. In other words, if the Central Bank wants to stabilize output around its potential, it will have to make a great effort. That means a large reduction of interest rates or a large increase in monetary aggregates will be necessary to have a modest impact on output. So, in order to achieve a modest impact on output the Central Bank will have to increase inflation in a big amount, resigning it as an objective.

Of course, if the economy begins a path of de-dollarization the possibility that the Central Bank turns to a more flexible type of inflation targeting grows.

Another argument is that, if the public knows that there is an objective about output it could lead to behaviors that could end in an inflationary bias – more pronounced if the public also knows that the increase on inflation needed to affect output is big. One way of addressing the problem of inflationary bias is by means of building reputation by the Central Bank, so as it gains more reputation it could be possible to go to a more flexible regime; but perhaps this reputation could be obtained only after enough time of effective targeting of prices only.

As a conclusion, the adoption of an inflation targeting in the Uruguayan economy should be strict at the beginning, and perhaps for a long time. As long as the Uruguayan economy

can improve the use of domestic money and the Central Bank also gains reputation it will be possible to gradually shift to a more flexible regime.

## **Instruments**

As previously seen, in the Uruguayan economy neither interest rates nor monetary aggregates are good instruments in order to affect prices. So, there is a big temptation to use the exchange rate as an instrument, because this variable has proved to be the most influent in the price formation mechanism. One of the questions that arises is whether the Uruguayan economy should return to an scheme based in a exchange rate fixed by the Central Bank (either as a single value or in the context of a target zone). This is not a standard practice in inflation-targeting regimes, but –at least theoretically – it could be compatible therewith, provided that the exchange rate doesn't become an objective in itself and is managed with enough flexibility so as to adjust its path to a goal of inflation, taking into account the changes in real exchange rate. Indeed, the first steps of inflation targeting in Chile were in a context of a band of floatation.

Around 2.001 analysis suggested the convenience of adopting an inflation-targeting regime in Uruguay without abandoning the exchange rate regime<sup>3</sup>. Although some of the studies done in this field were made with the intention of emphasizing the advantages of an inflation targeting regime using the exchange rate as an instrument relative to an exchange rate rule, they suggest that, for the Uruguayan economy, the option of fixing the exchange rate was better than the option of free floating. Several reasons justified this position. First, there was empirical evidence of a high pass-thru between exchange rate and prices<sup>4</sup>. Second, the high degree of dollarization determines a marginal role played by domestic currency. Third, the instability of neighbors (Brazil and Argentina) affects domestic price index. Fourth, the exchange rate market is not very deep, so the exchange rate is very sensitive to small transactions.

These ideas are – or were in the years before the crisis - very attractive for an economy like the Uruguayan and, undoubtedly, the exchange rate is more effective than managing the interest rate or the monetary aggregates, provided that the economy has the adequate level of international reserves that allows the Central Bank to support the exchange rate. But it also implies another costs – that probably were difficult to detect in 2.001. In fact, the effectiveness of the exchange rate as an instrument is based on perverse aspects of the Uruguayan economy that a fixed exchange rate probably exacerbates. The use of a fixed exchange rate promotes dollarization and deepens the pass thru between exchange rate and prices. This is not a problem in normal conditions, but becomes a nightmare when there is a change in the equilibrium real exchange rate – due to a “sudden stop” for example – because of its lack of flexibility at the moment of processing this change. This situation leads to huge devaluations, big drops in output and financial crisis; the same that happened in 1.982 and 2.001.<sup>5</sup>

---

<sup>3</sup> For example, see Licandro (2.001)

<sup>4</sup> See Bucacos (2.000)

<sup>5</sup> Normally, when there is a dramatic change in real exchange rate, it is very difficult for the Central Bank to determine the new equilibrium value of this variable. It is practically impossible to move the nominal exchange rate just to a point where the path of the targeted inflation remains unchanged, so there is a tatonnement process with overshooting or undershooting of the exchange rate, that leads to further devaluations. In most of the cases this is resolved by letting the exchange rate floating free, thus abandoning the regime, leaving the economy

Therefore, although in terms of effectiveness to achieve a goal of inflation there are very good reasons to fix the exchange rate, there are also very good reasons to use other instruments that – although less effective to influence prices - can help to reduce some risky characteristics of the Uruguayan economy by breaking the close relationship between exchange rate and prices.

Leiderman and Bufan (1999) analyze inflation targeting in Israel, an economy that shares some similar characteristics with Uruguay and that implemented inflation targeting in the context of a crawling band for the exchange rate. Although the regime was effective to stabilize the economy it was changed to a more flexible one – by widening the borders of the band – because of some of the problems that it gave rise to. These problems were: difficulty to keep the exchange rate commitment in a world of great capital mobility, slowness of the process of real exchange rate adjustment to new equilibrium values, lower perception of the actual exchange rate risk, and conflicts with other objectives of macroeconomic policy, including monetary policy and the inflation target.

In this moment, in Uruguay, and for the reasons that were mentioned before, monetary aggregates seems to be more appropriate than interest rates when used as an intermediate objective, because of its better correlation to prices. The possibility to shift from monetary aggregates to interest rates depends on the development of financial markets in national currency and the appearance of a transmission channel that now is fully blocked.

Nevertheless, there is one point that has not been discussed yet in the country: in most of the economies the interest rate is used as an intermediate objective not because of its relationship with the final objective but because of its effectiveness as a signal. This use of the instrument deserves more attention and perhaps in this sense the interest rate could be used as an instrument in a relative next future.

### **What index to target ?**

Some countries don't use the common CPI to be targeted. Instead, they announce their commitments in terms of indicators of core inflation, underlying inflation or they include escape clauses in order to exclude possible deviations originated in transitory shocks that are beyond the control of the authorities.

In the case of Uruguay it seems that –as it is very important to regain credibility for the Central Bank – the easier the index the better it is. The normal CPI is understood for everyone, its methodology is well known and so the introduction of new measures can be perceived by the public as a decrease in transparency.

Of course, to the extent that the Central Bank builds reputation it could be possible to introduce more sophisticated mechanisms to determine the variable to be targeted.

Nevertheless, there is a very relevant problem with the targeting of pure CPI.

---

without an anchor and resulting in loss of reputation of the Central Bank. This happened both in 1982 and 2002.

As was mentioned before the Uruguayan economy is exposed to large swings in relative prices (not only in real exchange rate but also in terms of trade) and - as there is lack of flexibility in the prices of non-tradable goods - the economy is very vulnerable to these shocks. This is one of the reasons behind the inconvenience of targeting the exchange rate: when equilibrium real exchange rate rises the adjustment in non-tradable prices is very slow, so a recession comes unless there is a correction in the nominal exchange rate.

To a less extent the same problem arises in an inflation-targeting regime when the economy faces a large change in the equilibrium real exchange rate if the target is set very low and if non-tradable prices are rigid. If the real exchange rate has to rise the flexibility of the exchange rate allows the rise in the price of tradable goods pushing the CPI upwards. So, non-tradable goods have to deflate in order to achieve the goal of inflation. At this point the policy maker faces a trade-off between having a recession or abandoning the inflation target.

In the case of Uruguay this issue is very important –and goes beyond the discussion whether the inflation-targeting regime should be pure or flexible – because of the magnitudes of the external shocks that receives its economy. In other economies not subject to such shocks and with more flexible markets a target of 2 or 3 percent a year plus some flexibility in the reaction function should be enough to accommodate relative prices without losing the target.

In the same direction, Ball (1998) suggests that in an open economy, targeting pure inflation can be dangerous because it creates large fluctuations in exchange rates and output, so he proposes the targeting of long-run inflation, which is defined as “an inflation variable purged of the transitory effects of exchange-rate fluctuations”.

Other authors suggest targeting a consumer non-tradable price index<sup>6</sup>. This proposal is very interesting, but has some implementation problems. First, as in the case of core inflation the public could perceive it – at least in early stages of the regime – as lack of transparency. Second, the condition of “non-tradable” of a good is not a condition per se, it is endogenous to relative prices, making the elaboration of an appropriate index difficult. Third, and related to this, some tradable goods have non-tradable components attached, Fourth, some non-tradable prices are administrated by the Government, so the fiscal policy can interfere with the objective. Fifth, there is still the question of what is the adequate instrument to manage domestic prices.

Another issue to resolve is whether the Central Bank has to target the price level or the inflation rate. This is not an easy question, but for the same reasons that were mentioned before – that is there is an important and previous objective that is regaining credibility – a price level objective – if feasible to achieve - could be more effective for reputation, because people know that transitory shocks won't be incorporated as permanent ones in prices. Due to the lack of flexibility of nominal variables in Uruguayan economy deviations from the long run values of CPI that are not offset by the monetary policy may result in persistent disequilibria in relative prices.

---

<sup>6</sup> See for example: Parrado and Velasco (2.002), Caballero and Krishnamrthy (2.003), Bharucha and Kent (1998).

### **If not inflation targeting, what?**

From the preceding analysis it is clear that the implementation of an inflation targeting is not an easy task. Even more, if the Central Bank is not successful in reversing the dollarization process or in regaining credibility there is a great risk that the inflation-targeting regime fails remaining the Uruguayan economy without an anchor.

The question is whether the Central Bank has to comply with this situation or if it has to try another solution.

Although this issue is not under discussion in this moment, one of the alternatives could be full dollarization.

Calvo and Reinhart (2002) and Calvo (2000) advocate for full dollarization for some emerging market economies. Indeed, some of these countries which adopt a free-floating regime don't float freely (this situation is called "fear of floating"), using their international reserves to mitigate the fluctuations of the exchange rate. The fear of floating is related to the two facts: on one hand in these countries there is a strong relationship between depreciation of the exchange rate and inflation and on the other the indebtedness of the economy is mostly denominated in dollars. In this context full dollarization can help to reduce the incidence of external shocks (to which the Uruguayan economy is very exposed to).

#### IV. CONCLUSIONS

The Uruguayan economy suffered a big crisis in 2002 that was deepened by its high degree of dollarization. After this, a new monetary policy was implemented. The first attempts of the Central Bank were in order to simply keep inflation at manageable rates. This objective was seriously hindered because of the lack of instruments, experience and credibility of the Uruguayan economy.

After this objective was achieved, it tried to commit to an intermediate operative target of monetary base, in order to rebuild the seriously damaged reputation of the Central Bank. At present, the Central Bank is making a stronger commitment to prices, being more flexible with the monetary base goal.

At the same time efforts were made in order to reduce the degree of dollarization and to create new instruments for the monetary policy. Transparency and communication were also enhanced through several measures.

This process should converge slowly to an inflation-targeting regime, provided that the institutional framework and the reputation of the Central Bank allow it.

At the beginning, an inflation-targeting regime should be very strict, in terms that it won't try to stabilize output, the instrument should be the monetary aggregates, the target the ordinary CPI.

As time goes on and the Central Bank builds reputation and there are advances in the de-dollarization process the system could shift to a more flexible one.

## BIBLIOGRAPHY

**Ball, Laurence.** “Policy rules for open economies”. National Bureau of Economic Research. Working paper. <http://www.nber.org/papers/w6760>.

**Bharucha, Nargis and Kent, Christopher,** “Inflation targeting in a small open economy”, Research Discussion Paper 9807, Economic Research Department, Reserve Bank of Australia, (1998).

**Bernanke, Ben S. , and Mishkin, Frederic S.,** “Inflation Targeting: a new framework for monetary policy?”. Journal of Economic Perspectives, volume 11, number 2, spring 1997. Pages 97-116.

**Bucacos, Elizabeth,** “La formación de precios en Uruguay: 1988:01-1998:12” Central Bank of Uruguay, Working paper 4/99 (Mimeo). 1999

**Bucacos, Elizabeth and Licandro, Gerardo,** “La demanda de dinero en Uruguay: 1980:1- 2.002:4” Central Bank of Uruguay, Revista de Economía, vol. 10, number 2, 2.003

**Caballero, Ricardo J. and Krishnamurthy, Arvind:** “Inflation targeting and Sudden Stops”. (2.003), paper prepared for the NBER’s Conference on Inflation Targeting, January 2.003, Bal Harbour, Florida.

**Calvo, Guillermo A. and Reinhart, Carmen M.,** “Fear of floating: Theory and evidence” (2.002) Quarterly Journal of Economics. May 2.002 117(2), pages 379-408.

**Calvo, Guillermo A. ,** “Capital markets and the exchange rate. With special reference to the dollarization debate in Latin American” (2000a), Research paper. <http://www.bsos.umd.edu/econ/ciecrp9.pdf>

**Calvo, Guillermo A.** “The case for hard pegs in the brave new world of global finance” (2000b)

**Central Bank of Uruguay,** Monetary policy bulletins. 2.003-2.004. <http://www.bcu.gub.uy/a26005.html>.

**Fernández Castro, Rosanna,** “El plan de estabilización de 1990”. Central Bank of Uruguay, Revista de Economía. Vol. 4, nro. 2, Segunda época. 1997

**Eichengreen, Barry and Hausmann, Ricardo,** “Exchange rate and financial fragility”, Federal reserve Bank of Kansas City’s Conference on issues in monetary policy, Jackson Hole, Wyoming, 27-29 august 1999.

**Green, John H.,** “Inflation Targeting: Theory and policy implications”. IMF Staff Papers, volume 43, number 4, December 1996. Pages 779 - 795.

**Leiderman, Leonardo and Bufman, Gil**, “Inflation targeting under a crawling band exchange rate regime: lessons from Israel.” (1999). IMF: “Inflation targeting in practice”. Edited by Mario Blejer, Alain Ize, Alfredo Leone and Sergio Werlang.

**Licandro, José A.** , “The scope for inflation targeting in Uruguay”, 2.001, Central Bank of Uruguay, working paper.

**Parrado, Eric and Velasco, Andrés**. “Alternative monetary rules in the open economy: a welfare-based approach” (2.002). Central Bank of Chile: “Inflation targeting: Design, Performance, Challenges”. Edited by Norman Loayza and Raimundo Soto.

**Svensson, Lars E.O.**, “Inflation targeting as a monetary policy rule”, *Journal of Monetary Economics* 43, 1999. Pages 607-654.