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Financial Markets and Monetary Control
Under High Inflation - The Case of Argentina

by

Bernhard Fischer and Peter Trapp

Institut für Weltwirtschaft an der Universität Kiel

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Financial Markets and Monetary Control Under High Inflation - The Case of Argentina

1. Introduction

Argentina's economic development over the last thirty years has been dominated by very high and variable inflation rates. There is widespread agreement that the financial sector is most seriously affected by persistent inflation. This was also true for Argentina. Due to interest rate ceilings and other regulations relative yields on particular financial assets have been affected differently by inflation. While the holdings of non-interest bearing assets (currency in circulation and demand deposits) were fully exposed to the inflation tax¹, time deposits at a controlled rate or indexed deposits were partially protected from inflation losses, however, at varying degrees. As a consequence there was a tendency to substitute money in circulation and demand deposits for interest-bearing short-term assets. On the whole, the attempt to avoid the inflation tax resulted in a demonetization of the economy. Since banks and non-bank financial institutions relied on different financial instruments they were differently affected by the impact of the inflation tax on the holdings of financial asset. Furthermore, inflation rates and real interest rates have been more variable when inflation was extremely high. This involved large-scale arbitrage possibilities by shifting funds from one financial asset into another. Such speculative movements had heavy repercussions on banks and non-bank financial institutions and added to the instability of the financial sector as a whole.

As to credits strong fluctuations of relative prices in goods markets have made the evaluation of creditworthiness more compli-

¹ The inflation tax is equivalent to the loss of purchasing power of financial assets which is not offset by interest-payments.

cated. Both the shortening of maturities on the deposit side and the difficulties in assessing credit risks have generated a tendency towards shortening the maturity of credit operations too, i.e., the financial system was no longer able to perform adequately its function as a "transformator" of maturities between active and passive operations. As a consequence long-term investments are no longer financed by the private financial system. More generally, a disintermediation process took place which resulted in a dramatic increase of per unit financial operational costs (Fischer, Trapp 1985a, p. 13) and, finally, threatened to lead to a collapse of the financial sector in 1982.

When inflation rates remained persistingly high and external adjustment was impeded by maintaining an overvaluation of the exchange rate conventional sources to finance the public sector deficit could no longer be exploited. Therefore, in order to satisfy its financing needs the government had to rely more and more on the inflation tax. However, since an accelerated erosion of the purchasing power of money propelled the process of demonetization of the economy the base from which the inflation tax could be levied declined steadily and the maintenance of a given public deficit required higher and higher tax rates, i.e., more inflation¹.

Efforts to control the monetary expansion, to improve the collection of the inflation tax and to maintain a diversified structure of the financial system resulted in heavy interventions into the financial markets in Argentina². For some time, legal reserve requirements have been kept at 100 p.c., thus deposits have been "nationalized", and lending activities exclusively depended on discretionary rediscount facilities opened up by the monetary authorities. Under such regulations, financial institutions lost

¹ For a more detailed discussion of this issue see Fischer and Trapp, 1985b.

² Financial policies in Argentina from 1973 to 1984 are analysed by Fischer and Trapp, 1985a.

Table 1 - Basic Economic Indicators, Argentina 1970-1983

Year	Per-Capita Income ^a (Percentage change)	Public Sector Deficit ^b (P.c.of GDP)	Bank Credit to the Pri- vate Sector in Real Terms (Percentage change)	Money Supply ^c M1 (Percentage change)	Rate of Inflation ^d	Real Wages (Percentage change)	Current Account ^e (Millions of US-\$)
1970	4.3	- 0.9	6.5	12.9	13.6	3.7	- 163
1971	2.1	- 3.5	-25.2	24.4	34.7	1.5	- 390
1972	0.4	- 5.2	-16.3	39.1	58.5	- 5.2	- 227
1973	1.8	- 7.3	26.6	74.7	60.3	4.9	711
1974	4.1	- 9.4	15.0	70.8	24.2	10.5	118
1975	-1.9	-15.1	-43.9	96.3	182.8	- 3.6	-1,287
1976	-2.0	-11.7	-13.8	303.1	441.1	-28.1	651
1977	4.7	- 5.1	46.2	155.7	176.0	- 7.5	1,126
1978	-4.9	- 6.8	14.9	135.6	175.5	- 2.2	1,856
1979	5.0	- 6.3	43.5	155.8	139.7	13.3	- 513
1980	-0.7	- 7.6	32.4	120.7	100.7	12.7	-4,774
1981	-7.5	-15.6	- 5.0	53.2	104.4	- 8.7	-4,712
1982	-6.6	-16.5	-24.7	165.2	164.7	-10.6	-2,477
1983	1.6	-15.8	-52.2	312.0	343.8	+14.0	-2,000 ^f

^aAt 1970 constant prices; ^bNon-financial public sector; ^cCurrency in circulation and demand deposits;

^dConsumer prices of Greater Buenos Aires, annual average; ^eIncludes net current transfers; ^fEstimate.

Source: BCRA, FIEL, IFS.

their intermediation role between savers and investors and were degraded to administrative branches of the Central Bank. During the liberalization period from 1976 to 1981 the government tried to reestablish a fractional reserve system. Given the high rate of inflation banks as compared to non-bank institutions which were not allowed to offer non-interest demand deposits enjoyed a competitive advantage which could not be diminished by differential reserve ratios. In order to maintain a diversified structure of the financial sector and to ensure a broadly-based collection of the inflation tax the Central Bank adopted a uniform reserve ratio for all deposits and introduced an additional regulation mechanism, the monetary regulation account (Cuenta de Regulación Monetaria).

In chapter 2 the problem of monetary control under high inflation is discussed in the Argentine context. The basic idea of the monetary regulation account is presented by using a simple model in chapter 3. In chapter 4 reference to Argentina's experiences with this regulation mechanism is made, empirical evidence is given for its financial sector impact and its inflationary effects.

2. Fiscal Deficits and Monetary Control

Since 1970 Argentina experienced a considerable widening of the public sector deficit (Table 1). At the same time money supply (M1) and subsequently the inflation rate rose dramatically, especially in 1976 and since 1983. During the liberalization period an increasing part of the public sector deficit was financed in the domestic credit market (bank credits and bond sales). From 1980 to mid-1982 the government even increased its indebtedness in international credit markets (Table 2). Since the funds were hardly used for productive purposes but mainly spent on consumption goods, prestige projects, and income transfers there was no increase in real income providing the revenues from which the debt service could be paid. Concerning the external debt it became increasingly difficult to make due interest payments in the course of 1982 because of insufficient export earnings and rising

Table 2 - Financing of the Public Sector Deficit, Argentina
1970-1984

Year	Total Public Sector Defi- cit ^a (p.c. of GDP)	Financing of the Deficit (p.c.)		
		Central Bank	Domestic Credit Market	International Credit Market
1970	2.8	67.9	25.0	7.1
1971	3.2	37.5	0.0	62.5
1972	4.4	50.0	31.8	18.2
1973	6.9	81.2	40.6	-21.8
1974	9.3	68.8	30.1	1.1
1975	14.1	54.6	44.0	1.4
1976	12.9	80.6	58.9	-39.5
1977	11.9	102.5	36.1	-38.6
1978	10.1	69.3	55.4	-24.7
1979	9.0	50.0	71.1	-21.1
1980	11.3	28.3	24.8	46.9
1981	16.4	17.7	39.6	42.7
1982	17.2	23.8	41.9	34.3
1983 ^b	15.0	100.0	0.0	0.0
1984 ^b	15.0	100.0	0.0	0.0

^aFigures differ from those in Table 1 because of a different definition of the public sector deficit. - ^bEstimates.

Source: Cavallo, Peña (1983); Own calculations.

international interest rates. Due to interest payment arrears Argentina was finally barred from any further access to the international capital market in 1983.

But even before the external debt problem emerged private savings were not sufficient to provide the funds needed to finance private investment and the public sector deficit. Faced with accelerating rates of inflation financing the deficit in the domestic credit market became more and more unfeasible because the high nominal rates of interest, required to attract private sector savings, contributed to increase the fiscal deficit even more and had a depressing effect on private investment activity. As a consequence, credit from the Central Bank has always been used heavily to finance part of the deficit. Since the mid-82 the printing of money practically became the only source of finance for the public sector deficit.

In order to offset the expansionary effect of large Central Bank credits to the public sector on the money supply, monetary authorities had to keep the credit creation by the banking sector under strict control. An instrument widely used in Argentina for this purpose was to impose high reserve ratios on peso-denominated deposits. In 1973 and in mid-1982 reserve ratios were even raised to 100 p.c.¹. During these periods any bank lending to the private sector was dependent on rediscount facilities provided by the Central Bank. Lending and deposit rates were controlled. Since lending rates were negative in real terms, some kind of credit rationing was necessary. As the banks were acting merely as agents of the Central Bank risk and profitability evaluations of credit transactions were considered to be of minor importance, borrowing became mainly a function of lobbyist power.

From the point of view of a more efficient functioning of the banking sector a fractional reserve system would have been a more

¹ For a description of that period see Fischer and Trapp 1985a, p. 14.

attractive alternative. However, under very high rates of inflation reserve ratios cannot be determined in such a way as to preserve the variety and the stability of the financial sector and to allow an effective control of monetary expansion at the same time. As will be demonstrated in the following section, an additional regulation mechanism was needed in order to accomplish both functions. This mechanism was introduced in Argentina in 1977 as part of a financial reform program under the name Cuenta de Regulación Monetaria (Monetary Regulation Account - MRA).

3. The General Scheme of the Monetary Regulation Account

In this chapter the rationale and the functioning of the MRA is explained under the following assumptions¹: There are two types of financial institutions in the financial system, namely banks (B) holding non-interest bearing demand deposits (D) and non-bank financial institutions (F) holding only time deposits (T). The total amount of credit granted at an interest rate (i_K) is the same for each institution. The reserve ratios imposed on the financial system are (r_T) for time deposits and (r_D) for demand deposits.

Under these conditions the net financial returns for time deposits (π_T) and demand deposits (π_D) in per unit terms are:

$$(1) \quad \pi_T = (1-r_T)i_K - i_T - c_F$$

$$(2) \quad \pi_D = (1-r_D)i_K - c_B$$

where (c_F) and (c_B) are the operative costs of non-bank financial institutions and of banks, respectively. Comparing (1) and (2) it is clear that non-bank financial institutions are in a disadvant-

¹ Detailed informations on the more technical aspects of the MRA are provided by Ruiz and Otero, 1983.

age because they have to pay interest on deposits. When $r = r_T = r_D$ financial returns are much higher for banks, therefore non-bank financial institutions are not competitive under such circumstances¹. However, assuming low inflation rates and $c_F < c_B$ it is possible to equalize the net returns of both types of deposits by imposing a reserve ratio on demand deposits which is sufficiently higher than that on time deposits, i.e., establishing a differentiated reserve requirement system which is well known from many industrialized countries.

If $r_T = 0.1$, $r_D = 0.6$, $i_K = 0.05$, $i_T = 0.03$, $c_F = 0.005$ and $c_B = 0.01$ net returns on both demand and time deposits would amount to 1 p.c. of the total amount of deposits. However, with very high inflation rates - e.g. more than 100 p.c. per annum - such a differentiated reserve system cannot equalize the rates of return on both kinds of deposits. The reason for this is that the inflation tax on demand deposits in part remains in the banking sector. The reserve ratio determines the share of the inflation tax revenues which go to the treasury, the remaining revenues increase bank profits. In order to have at least a net financial return of $\pi_T = 0$ the difference between the interest rate on credits and on time deposits (spread) must be at least equal to the right hand side of the following equation which is derived from (1):

$$(1a) \quad (i_K - i_T) \geq \frac{r_T \cdot i_T + c_F}{1 - r_T}$$

If $r_T = 0$ the spread required to achieve $\pi_T = 0$ would be equal to the operative costs (c_F) and for $r_T > 0$ it would have to be larger. It becomes extremely large when - like in the case of Argentina - reserve ratios are in the order of 50 p.c. or more because part of the base money increase created by Central Bank financed budget deficits has to be absorbed and when interest

¹ Assuming e.g., $r=r_T=r_D=0.1$, $i_K=0.1$, $i_T=0.075$ and $c_F=c_B=0.005$, earnings per unit of time deposits are 1 p.c. and earnings per unit of demand deposits are 8.5 p.c. If banks reduce the lending rate to 8 p.c. non-bank financial institutions would incur losses which eventually would force them to drop out of the market.

rates on time deposits are extraordinarily high due to high inflation¹. In an open economy with no major restrictions on capital flows such interest rates would attract foreign capital and lead to the breakdown of the non-bank financial institutions. Taking into account international capital markets the limits for the domestic interest rates are

$$(1b) \quad i_T^* \leq i_T \leq i_K^* \quad \text{and}$$

$$(1c) \quad i_T^* \leq i_K \leq i_K^*$$

$$\text{where: } i_K^* = i_K^A + \dot{d}^e + \alpha + c' ,$$

$$i_T^* = i_T^A + \dot{d}^e + \alpha + c'' ,$$

$$i_K^A = \text{international interest rate for credits,}$$

$$i_T^A = \text{international interest rate for time deposits,}$$

$$\dot{d}^e = \text{expected rate of devaluation,}$$

$$\alpha = \text{exchange rate risk,}$$

$$c', c'' = \text{transaction costs.}$$

If the net return on time deposits shall be positive or zero then the reserve ratio on time deposits has to be determined according to the following expression

$$(1d) \quad r_T \leq \frac{(i_K^* - i_T^*) - c_F}{i_K^*}$$

¹ With $r_T = 0.5$, $i_T = 1.0$ and $c_F = 0$ the gross spread $(i_K - i_T)$ required to have a zero net return on time deposits would amount to 100 percentage points.

π_D is zero if r_T is equal to the right-hand term. Equations (1a) and (1d) suggest that non-bank financial institutions can only survive if the reserve ratio for time deposits is very low or even close to zero.

The corresponding maximum value for reserve ratio for demand deposits is given by

$$(2a) \quad r_D < 1 - \frac{c_B}{i_K}.$$

From this it is clear that for a given value of r_D bank profits will be the bigger the higher interest rates are due to inflation. Under a regime of very high inflations the maximum value for r_D consistent with a zero net return on demand deposits will be close to one.

The equilibrium condition for the financial sector requires that net financial returns on both types of assets are equal:

$$(3) \quad (1-r_T)i_K - i_T - c_F = (1-r_D)i_K - c_B$$

Although in principal it is possible to get a combination of r_D and r_T which fullfils equation (3) it is, however, not very likely that this set of reserve ratios is consistent with the objective to control monetary expansion effectively¹. Thus, under very high inflation rates it is impossible to guarantee the stability of the financial system and to control credit expansion by a fractional reserve system.

¹ This can be demonstrated by a numerical example. The average reserve ratio considered to be necessary to control the money supply is 50 p.c. ($\bar{r} = 0.5$) 30 p.c. of total deposits are held as demand deposits, 70 p.c. as time deposits at an interest rate of 100 p.c. ($i_T = 1$). The interest rate on credits is 110 p.c. ($r_K = 1.1$), c_F and c_B are assumed to be zero. The reserve ratios necessary to maintain the stability of the financial sector could be for time deposits zero p.c. ($r_T = 0$) and for demand deposits 90 p.c. ($r_D = 0.9$). The average reserve ratio of 27 p.c. resulting from this hypothetical numerical system is however different from the reserve ratio consistent with the stabilization target (50 p.c.).

In order to achieve both targets the Monetary Regulation Account was established in Argentina in 1977¹. Under this system there are uniform reserve ratios for both kinds of deposits. Furthermore, banks have to pay a fee on the holdings of demand deposits and non-bank financial institutions receive a compensation on the reserve component of interest bearing deposits. Thus, by taxing the profits stemming from the lending capacity of demand deposits and by paying interest on reserves for time deposits net returns on both kinds of deposits are equalized. The main idea behind this regulation was to avoid the discrimination of non-bank financial institutions resulting from an uniform reserve ratio by reducing the banks' gross spread². In addition, it was intended to ensure a complete collection of the inflation tax.

Given this system net returns on time deposits and on demand deposits in per unit terms are defined as follows:

$$(4) \quad \pi'_T = (1-r) \cdot i_K + r \cdot i_{co} - i_T - c_F$$

$$(5) \quad \pi'_D = (1-r) \cdot i_K - (1-r-e) \cdot i_{ca} - c_B$$

where: i_{co} = rate of compensation for the reserves hold on time deposits,

i_{ca} = rate of charge on the lending capacity of demand deposits,

e = rate free of charge on the lending capacity of demand deposits.

Under the assumptions that $c_B > c_F$ and $i_{co} = i_{ca} = i_T$ it follows from (4) and (5):

¹ For a discussion of alternative solutions see Arriazu, 1983.

² With a uniform reserve ratio non-bank financial institutions would disappear from the financial sector unless their operative costs are considerably lower than those of banks. This, however, is not likely to be the case because of the high administrative costs involved in banking operations under high inflation rates.

$$(4a) \pi_T'' = (i_K - i_T) \cdot (1-r) - c_F$$

$$(5a) \pi_D'' = (i_K - i_T) \cdot (1-r) + e \cdot i_T - c_B$$

The equalization of π_T'' and π_D'' then requires:

$$(6) e = \frac{c_B - c_T}{i_T}$$

Equation (6) shows that the MRA ensures the stability of the financial sector independent of the level of the reserve ratio which can now be chosen solely for stabilization purposes. However, whether the monetary regulation account itself is neutral with respect to inflation or not depends of the balance between total receipts and total expenditures.

The MRA obtains resources from the financial sector by charging the lending capacity of demand deposits. Total receipts (R) are:

$$(7) R = (1-r-e) \cdot D \cdot i_{ca}$$

On the other hand the MRA pays interest on legal reserves financial institutions have to hold for time deposits at the Central Bank. Total compensation (E) amounts to:

$$(8) E = r \cdot T \cdot i_{co}$$

The saldo (S) of the MRA then can be calculated as

$$(9) S = E - R = r \cdot T \cdot i_{co} - (1-r-e) D \cdot i_{ca}$$

The reserve ratio needed to keep the MRA in balance requires $S=0$ and in order to equalize the net returns of time deposits and demand deposits it is necessary that $i_{ca} = i_{co}$. Thus it follows from (9)

$$(10) \quad \frac{r}{(1-r-e)} = \frac{D}{T}$$

If equation (10) is fulfilled the MRA is neutral with respect to monetary expansion¹. A shift from demand deposits to time deposits² has to be accompanied by a reduction of r or e ; otherwise the MRA will run a deficit because revenues are declining and compensation payments are increasing. Thus there will be an expansionary effect on money supply stemming from the MRA. Because this kind of substitution between the two deposits is to be expected when (expected) inflation rates rise and opportunity costs of holding non-interest bearing deposits increase rapidly, there is an element of instability inherent in the regulation system. Therefore, the neutrality of the system with respect to monetary expansion which can be shown for a given structure of total deposits is no longer valid when the dynamics of inflation are taken into account.

4. Financial Sector Impact and Inflationary Effects of the MRA

The financial disintermediation caused by high and accelerating inflation and negative real rates of interest (Table A2) is clearly indicated by the development of the liquidity coefficients (Table 3). The ratio of money - broadly defined (M2) - to GDP declined from 25.1 p.c. in 1970 to a low of 9.6 p.c. in 1976. Although the interest rate liberalization policies introduced in July 1977 led to a temporary increase of the ratio to 25.4 p.c. in 1980, the June 1982 financial reform again reinforced the - disintermediation process and led to a fall of the M2 to GDP

¹ The neutrality conditions of the MRA in a macroeconomic framework are discussed by Salama, 1984.

² In a system of legal reserves differentiated by type of deposits this substitution affects the money multiplier.

Table 3 - Liquidity Coefficients^a, Argentina 1970-1984

Year	Monetary base/GDP	M1/GDP	M2/GDP
1970	10.5	14.7	25.1
1971	8.4	12.6	21.9
1972	6.3	9.7	17.1
1973	8.0	11.0	19.0
1974	12.3	14.8	26.3
1975	8.3	10.0	14.8
1976	7.3	6.7	9.6
1977	9.3	6.5	13.6
1978	10.6	6.4	17.9
1979	7.7	6.2	19.5
1980	7.1	7.7	25.4
1981	7.1	6.0	22.9
1982	11.9	4.7	15.6
1983	12.8	4.1	12.4
1984 ^b	11.8	3.9	11.0

^aMonetary aggregates deflated by the index of wholesale prices (1970 = 100) divided by real GDP at market prices.

- ^b 1st half of 1984.

Source: BCRA, FIEL.

ratio to 12.4 p.c. in 1983¹. Disintermediation went along with demonetization, as can be seen by the marked decline of the M1/GDP ratio. At the same time the Argentine Central Bank tried by means of the Monetary Regulation Account to maintain a differentiated institutional framework of the financial system (Table A1) by equalizing the net returns of demand deposits and interest bearing time deposits. The result was that the financial sector became increasingly overextended².

Not only the excessive number of financial institutions but also the high degree of concentration indicate that the Argentine financial sector is working in an inefficient way. In 1982, some 9 p.c. of the 133 domestic-owned private banks with net worths equal or greater than 1.0 billion pesos (US\$ 21.7 million) offered around 68 p.c. of the total loans within this group. As to the number of non-bank financial institutions there have been 111 finance companies with a share of only 2.2 p.c. of total loans and 28 of those institutions provided about 48 p.c. of the credits provided by this subgroup (Table A1).

While the structure of the financial sector could be maintained by the Monetary Regulation Account only at high economic costs it remains the question if this regulation mechanism has been successful in terms of controlling monetary expansion. According to equation (10) the ratio of demand deposits to time deposits has to be equal to the expression $\frac{r}{1-r-e}$ to ensure neutrality of the MRA with respect to monetary expansion. In order to evaluate

¹ Compared with countries like Brazil (29.1) and South-Korea (41.4), ranking in per capita-income terms below Argentina, this is a rather poor performance of financial deepening. See Fischer and Trapp, 1985a, p. 18.

² An important reason for the former expansion of the institutional framework was the deposit insurance system. The full government coverage allowed potentially insolvent financial intermediaries to compete effectively for funds by offering slightly higher yields.

the monetary effects of the MRA this relationship has to be analyzed. For this purpose it is useful to distinguish several phases. The data from mid-1977 to mid-1984 are given in Table 4.

In the period from the implementation in June 1977 to 1979/IV the MRA was in deficit¹. The decline of demand deposits to time deposits ratio was not offset by an adequate reduction of the reserve ratio (r) or an increase of the free margin (e) because this would have been inconsistent with the desired monetary expansion. As a consequence the negative balance of the MRA itself contributed to the expansion of the monetary base and thus fueled inflation.

When the process of financial disintermediation came temporarily to a stop (1980) while the reserve ratio continued to decrease and the free margin was further raised the MRA moved into a surplus exerting a contractive effect on the monetary base. However, due to an acceleration of the inflationary process the shift from demand deposits to time deposits started again in the first quarter of 1981 whereas r and e remained more or less at the same level. As a consequence there was again an expansionary monetary effect from the deficit of the MRA.

In the second half of 1982 the reserve ratio was raised to 1 which actually meant a complete control of credit expansion. Although in 1983 the reserve ratio was lowered somewhat it remained very high and financial institutions had to rely heavily on rediscount loans from the Central Bank. The figures in Table 4 indicate that the MRA had very expansive effects on the money

¹ When the MRA was introduced the ratio ($\frac{D}{T}$) was 0.59 and clearly higher than the numerical value of ($\frac{r}{1-r-e} = 0.45$) necessary for the "equilibrium".

Table 4 - Selected Financial Indicators and Monetary Effects of the Monetary Regulation Account (MRA), Argentina
1977-1984/II

Period	Minimum Reserves (r)	Rate of Charge/Compensation		Margin exempt of MRA charges (e)	$\frac{r}{1-r-e}$	Demand Deposits Total	Demand Deposits Time	Monetary Regulation Account			
								Changes ^a			
								Absolute	In per cent of the balance the mone- of the MRA tary base		
1977											
June	45.0		6.05	8.0	0.957	-	-	-	-	-	-
III	45.0		6.88	8.0	0.957	0.410	0.696	36	87.8	1.5	
IV	44.7	8.68		8.52	0.943	0.351	0.541	83	44.9	2.9	
1978											
I	44.0		8.05 ^b	7.3	0.904	0.310	0.450	105	22.7	2.6	
II	43.0		6.85	7.0	0.860	0.287	0.403	112	14.6	2.2	
III	40.7		6.97	6.3	0.770	0.272	0.374	148	12.9	2.5	
IV	33.0		6.72	6.0	0.545	0.249	0.332	116	7.4	1.8	
1979											
I	27.0		6.64	7.0	0.409	0.265	0.361	74	4.1	1.8	
II	27.0		6.53	7.0	0.409	0.249	0.333	97	4.7	1.1	
III	25.0		7.25	7.0	0.368	0.242	0.319	125	5.2	1.1	
IV	20.0		6.86	7.0	0.276	0.208	0.262	87	3.1	0.7	
1980											
I	13.2		5.54	9.3	0.170	0.202	0.253	-114	-4.1	-0.9	
II	11.3		4.70	12.0	0.148	0.208	0.262	-185	-8.0	-1.2	
III	12.5		5.47	12.0	0.165	0.201	0.252	-110	-6.1	-0.6	
IV	10.3		4.65	14.0	0.137	0.199	0.249	-203	-14.6	-1.1	
1981											
I	10.7		6.25	17.3	0.149	0.171	0.207	-195	-30.6	-0.8	
II	14.0		8.08	20.0	0.213	0.135	0.157	36	9.1	0.1	
III	17.5		n.a.	20.0	0.280	0.129	0.148	885	66.0	2.4	
IV	17.2		n.a.	20.0	0.273	0.128	0.147	719	18.0	1.6	
1982											
I	16.3		n.a.	20.0	0.257	0.133	0.153	522	9.8	0.9	
II	15.2		n.a.	20.0	0.235	0.124	0.142	384	5.2	0.4	
III	100,0							371	47.7	1.3	
IV	100,0							1,227	27.2	3.5	
1983											
I	94.7							2,057	86.6	5.9	
II	89.0							4,148	36.1	5.9	
III	87.3				n.a.			7,439	31.0	8.0	
IV	86.3							11,827	24.2	7.8	
1984											
I	86.0							18,420	39.6	7.0	
II	86.0							29,202	27.3	7.6	

^aWith respect to the previous month. - ^bIn February 1978 the rate of charge and the rate of compensation were unified.

Source: BCRA.

supply in that period. However, since deposits were more or less nationalized the deficit cannot be interpreted without taking into account to other positions of the balance sheet of the Central Bank, in particular rediscount loans which were allowed to expand sharply in order to compensate for the liquidity drain resulting from the increase in reserve ratios. Interest paid by the Central Bank on deposits has to be compared with interest payments received by the Central Bank on those rediscount loans which were necessary to allow banks to continue existing credit contracts¹. For such an analysis, however, the accounting practices of the Central Bank and of the banking system have to be improved in order to provide up to date information on the actual volume of deposits and loans².

To sum up, the empirical evidence on the monetary effects of the Monetary Regulation Account in Argentina suggests, that this mechanism was by no way neutral concerning the expansion of the monetary base although one has to keep in mind that an accurate judgement of the impact of the MRA is not possible due to statistical deficiencies.

5. Final Remarks

The evaluation of the Argentine experience with the Monetary Regulation Account has shown that under conditions of very high and variable inflation rates the structure of the financial sector can only be maintained at high economic costs in terms of a

¹ Fiscal aspects of the MRA are analyzed by Murphy, 1984.

² At present, e.g., deposits and credits are only adjusted irregularly for accrued interest. Since annual interest amounts to a multiple of the original deposit or credit failure to take into account due interest payments can lead to a considerable distortion of the balance sheet items.

highly inefficient financial sector. The regulations applied in Argentina could not prevent the continuation of the process of financial disintermediation and demonetization caused by rising inflation rates. As a result the financial sector became - compared to the volume of deposits and credits in real terms - grossly overextended. Furthermore the controls proved not to be neutral with respect to the monetary base and thus did not improve the control of the money supply.

The Argentine example clearly demonstrates that it is extremely difficult - if not impossible - to control monetary expansion and to maintain the functioning of the financial system if there is not a serious attempt to eliminate the main sources of inflation which in Argentina - as in most other countries suffering under severe inflationary pressures - stem from huge deficits of the public sector.

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Abbreviations

BCRA	Banco Central de la República Argentina
FIEL	Fundación de Investigaciones Económicas Latinoamericano
IFS	International Financial Statistics
IMF	International Monetary Fund
INDEC	Instituto Nacional de Estadísticas y Censos
\$a	Argentine Peso

Table A1 - Institutional Structure of the Financial System, Argentina 1982

	Institutions		Loans		Net Worth	
	Number	p.c.	Pesos (Billions)	p.c.	Pesos (Billions)	p.c.
1. Commercial banks	<u>197</u>	<u>47.7</u>	<u>1 317</u>	<u>81.5</u>	<u>139.6</u>	<u>83.3</u>
- Official ^a	31	7.5	378.2	23.4	172.7	43.4
- Private	166	40.2	939.3	58.1	66.9	39.9
- Domestic	(133)	(32.2)	(516.6)	(32.0)	(47.3)	(28.2)
- Foreign	(33)	(8.0)	(422.7)	(26.1)	(19.6)	(11.7)
2. Investment banks ^b	<u>3</u>	<u>0.7</u>	<u>3.3</u>	<u>0.2</u>	<u>0.3</u>	<u>0.3</u>
3. Mortgage banks	<u>1</u>	<u>0.2</u>	<u>33.5</u>	<u>2.1</u>	<u>10.2</u>	<u>6.1</u>
4. Development banks	<u>2</u>	<u>0.5</u>	<u>175.3</u>	<u>10.8</u>	<u>2.6</u>	<u>1.5</u>
5. Savings banks	<u>1</u>	<u>0.2</u>	<u>30.6</u>	<u>1.9</u>	<u>2.5</u>	<u>1.5</u>
6. Finance companies	<u>111</u>	<u>26.9</u>	<u>35.1</u>	<u>2.2</u>	<u>8.3</u>	<u>4.9</u>
7. Savings and loan association	<u>22</u>	<u>5.3</u>	<u>12.6</u>	<u>0.8</u>	<u>2.3</u>	<u>1.4</u>
8. Credit cooperatives	<u>76</u>	<u>18.4</u>	<u>7.8</u>	<u>0.5</u>	<u>1.8</u>	<u>1.1</u>
9. Total	413	100.0	1 615.7	100.0	167.6	100.0

^a Composed by banks owned by the federal government, state governments and municipalities, . ^b Official and private domestic and foreign banks.

Source: BCRA.

Table A2 - Selected Interest Rates, Argentina 1978-1984/II

- Rates per month, in per cent -

Period	Nominal ^a				Real			
	Credits		Deposits		Credits ^b		Deposits ^c	
	Controlled Rate	Free Rate	Controlled Rate	Free Rate	Controlled Rate	Free Rate	Controlled Rate	Free Rate
1973	1.6	2.5	2.1		-0.6	0.2	-2.0	
1974	1.6	2.2	2.1		-0.9	-0.4	-0.6	
1975	1.6	3.4	4.0		-4.7	-4.4	-3.6	
1976	3.3	7.0	7.4		-4.5	-3.9	-4.7	
1977	8.0	9.5	-		0.2	1.5	-	
1978		8.8		7.2		1.7		- 1.3
1979		7.3		6.4		- 0.4		- 0.9
1980		5.9		5.0		1.0		- 0.4
1981		9.8		8.1		1.9		0.8
1982 I		8.4		7.1		1.5		- 0.3
II		8.7		7.1		1.2		2.0
III	6.7	-	5.7	-	- 9.1	-	- 8.9	-
IV	8.7	13.9	8.0	10.2	- 3.3	1.4	- 3.1	- 1.2
1983 I	11.2	15.0	10.2	11.2	- 2.0	1.3	- 2.9	- 1.9
II	10.6	15.9	9.6	11.0	- 0.7	4.0	- 1.8	- 0.6
III	13.2	20.6	12.2		- 3.8	2.5	- 4.1	
IV	15.5	23.3 ^d	14.5		- 2.1	4.5	- 2.9	
1984 I	11.5	13.0 ^d	10.5		- 2.4	- 1.0	- 5.2	
II	14.0	18.0 ^d	13.0		- 4.5	- 0.9	- 4.1	

^aUp to 1977 for the highest interest rates recorded, then up to 30 days deposits. -

^b1973-77 deflated by the Wholesale Price Index, 1978-84 II deflated by the CARTECO Price Index. - ^cDeflated by the Consumer Price Index.- ^dInterest rates on bank acceptances.

Source: BCRA; Cavallo, Petrei, 1980; El Cronista Comercial, 1984; FIEL; Own calculations.