

### 3. Hyperinflation and Stabilization in Brazil: The First Collor Plan

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At the beginning of 1990 the Brazilian economy experienced hyperinflation for the first time. The rate of inflation reached 56 per cent in January, 73 per cent in February and 84 per cent in March. On 15 March a newly-elected president took office and the next day announced an ambitious stabilization programme, including a profound monetary reform. Ninety days after, when this paper was finished, it was clear that the plan failed to meet the expectations of its authors: inflation was back, in a very similar way to that under the previous plans, and a recession had already begun, differently from the recessions experienced under previous plans.

In this paper, divided into eight sections, we will analyse (1) the conditions that gave rise to hyperinflation in early 1990; (2) the alternative programmes of stabilization that were being suggested; (3) the logic of the stabilization plan that was finally adopted; (4) the insufficiency of the fiscal adjustment; (5) the liquidity question; (6) the demand problem; (7) the causes of the resurgence of inflation with recession; and finally (8) additional issues.

#### I BRAZILIAN HYPERINFLATION

The general conditions that gave rise to hyperinflation in Brazil were similar to the ones that prevailed in countries that had experienced hyperinflation earlier. Brazil was not defeated in a war nor was she required to pay war reparations, but the foreign debt accumulated in the 1970s, the external shock of 1979 (second oil shock and interest shock) and the suspension of new external financing since 1982 had together produced similar consequences. The country that in the 1970s received around 2 per cent of gross domestic product (GDP) of foreign savings was now required to transfer real resources of 4 to 5 per cent to the creditor countries.<sup>1</sup> The reduction in domestic investment was basically pro-

*Table 3.1 Public sector accounts (% GDP)*

	<i>Tax receipts</i>	<i>Personnel expenditure</i>	<i>Public deficit</i>
1979	24.7	7.0	8.3
1980	24.7	6.3	6.7
1981	24.5	6.4	6.0
1982	25.0	7.0	7.3
1983	24.7	6.5	4.4
1984	21.4	5.5	3.0
1985	22.0	6.8	4.3
1986	25.0	7.2	3.6
1987	22.2	7.5	5.5
1988	19.8	7.2	4.3

*Source:* First two columns, IBGE (Instituto Brasileiro de Geografia e Estatística); last one, Central Bank.

*Note:* The first two columns refer to the public sector in the strict sense; the last one includes state-owned corporations.

portional to this transfer: the rate of investment, which was around 22 per cent of GDP in the 1970s, fell to around 17 per cent in the 1980s.

On the other hand, there are the fiscal consequences of the foreign debt. The debt, which in the mid-1970s was 50 per cent private and 50 per cent public, was almost fully nationalized during the 1981–3 adjustment: at the end of the 1980s, 90 per cent of the debt was the responsibility of the public sector. In the 1981–3 stabilization programme there was a strong effort to reduce the budget deficit, but this effort was defeated, first, by the high rates of interest paid by the state and, second, by the increase of the foreign and domestic public debt (see Bresser Pereira, 1990). With the interruption of foreign loans deficit financing depended increasingly on domestic indebtedness and seigniorage. The consequence was a fiscal crisis: the budget deficit remained high (see Table 3.1), public domestic debt increased to around 50 per cent of GDP, maturities of domestic debt turned incredibly short (most of the domestic debt start being financed in the overnight market). The last characteristic is the most important one when defining the fiscal crisis since it shows that the state had completely lost creditworthiness. The fiscal crisis immobilized economic policy, transforming government into a passive instrument of validation of inflation through fiscal deficits and inflationary financing.

The strong, yet incomplete, adjustment programme of 1981–3 and the 1983 real devaluation of local currency led, first, to a real reduction of real wages and to the aggravation of distributive conflict (given the widespread conviction that income distribution is deeply uneven in Brazil) and then to a wage–price spiral. This wage–price spiral was engineered by an informal

but effective agreement among the labour unions and the firms of the modern and oligopolistic industries (Nakano, 1989).

The wage-price spiral has its origins in 1978-9, when the first big strikes since 1964 took place, but it only gained momentum in 1985, after the transition to democracy was completed. It did not lead to hyperinflation sooner for two reasons: first, the heterodox stabilization plans (1986, 1987, 1989) pushed down inflation for a while; second, given the high degree of formal and informal indexation, inflation in Brazil has a strong inertial component (Bresser Pereira and Nakano, 1987).

Inertial inflation tends to be rigid downwards, since future inflation is strongly linked to past inflation. But it also tends to hinder the acceleration of inflation, as long as it avoids or postpones the dollarization of the economy. In the 1923 German hyperinflation, for instance, the dollarization of the economy led to an exchange-rate/price spiral. Economic agents received payment in the local currency and immediately tried to buy dollars to protect their assets. As a consequence the real demand for dollars increased and real devaluations of the local currency took place continuously, leading to hyperinflation (Merkin, 1982). In contrast, in Brazil economic agents could protect their financial assets by buying indexed bonds, mostly Treasury bills financed daily in the overnight market. These bills (the LFTs - *Letras Financeiras do Tesouro*) represented a remunerated, interest-bearing, quasi-money, and thus a better alternative to buying dollars.

Actually to buy dollars was risky, first because the parallel exchange rate tended to be artificially high and, second, because it would fluctuate markedly. On occasion speculative attacks against the cruzado made the premium of the parallel market exchange rate over the official rate increase strongly. Inflation, however, would not follow immediately, given the low import coefficient of the Brazilian economy (less than 5 per cent of GDP) and the dual exchange rate market. The official exchange rate was under strict government control, protecting the trade balance from the wild fluctuations of the parallel exchange rate. It was indexed, following a crawling peg rule with daily devaluation. The parallel exchange rate was market-determined. After each speculative attack the premium would recede, imposing heavy losses on the last buyers.

The indexation of the economy delayed hyperinflation but did not avoid it. Inflation tended overall to accelerate, but its acceleration encountered levels or plateaus, and was interrupted by price freezes, starting in 1986 with the Cruzado Plan. However, after the breakdown of the Cruzado Plan and particularly of the Summer Plan (January 1989), inflation accelerated very rapidly, as these plans helped to disorganize the economy (see Table 3.2).<sup>2</sup> Confidence in the indexation system, which was already

**Table 3.2** *Yearly inflation rate*

<i>Year</i>	<i>%</i>	<i>Year</i>	<i>%</i>
1970	19.3	1980	110.2
1971	19.5	1981	95.1
1972	15.8	1982	99.7
1973	15.5	1983	211.0
1974	34.6	1984	223.8
1975	29.4	1985	235.1
1976	46.2	1986	65.0
1977	38.8	1987	415.8
1978	40.8	1988	1037.6
1979	77.2	1989	1782.9

*Source:* General Price Index (IGP/FGV – General Price Index – Getúlio Vargas Foundation).

**Table 3.3** *Monthly inflation rate*

	<i>1986</i>	<i>1987</i>	<i>1988</i>	<i>1989</i>	<i>1990</i>
Jan	17.8	12.0	19.1	36.6	71.9
Feb	22.4	14.1	17.6	11.8	71.7
Mar	-1.0	15.0	18.2	4.2	81.3
Apr	-0.6	20.1	20.3	5.2	11.3
May	0.3	27.7	19.5	12.8	9.1
Jun	0.5	25.9	20.8	26.8	
July	0.6	9.3	21.5	37.9	
Aug	1.3	4.5	22.9	36.5	
Sep	1.1	8.0	25.8	38.9	
Oct	1.4	11.2	27.6	39.7	
Nov	2.5	14.5	28.0	44.3	
Dec	7.6	15.9	28.9	49.4	

*Source:* IGP/FGV<sup>1</sup>.

very low, collapsed with the Summer Plan, because conventional indexation is based on past inflation, and past inflation was no longer a good proxy for present inflation. With the bankruptcy of indexation the price system lost its basic anchor. Inflation began to accelerate in a spiral way (see Table 3.3).

As the financial market lost confidence in Treasury bills the government increased its interest rate. The result was the increase in budget deficit and a perverse additional loss of credit of the Treasury bills. On the other hand, the successive plans changed the inflationary behaviour of economic agents, introducing new destabilizing factors in the economy.

Table 3.4 Public sector's interest payments (% GDP)

	<i>External debt</i>	<i>Domestic debt</i>	<i>Total</i>	<i>Public deficit</i>
1983	3.70	3.01	6.71	4.4
1984	3.89	3.30	7.19	3.0
1985	4.47	3.44	6.91	4.3
1986	2.89	2.23	5.12	3.6
1987	2.62	2.17	4.79	5.5
1988	2.85	2.88	5.73	4.3
1989*	2.80	9.50	12.30	12.4

Source: Central Bank.

\*The total figure for 1989 is taken from Central Bank of Brazil: *Brazilian Economic Program*, vol. 24, March 1990, p. 66. The interest on the foreign debt is estimated and, on the internal debt, a residue.<sup>3</sup>

They anticipated possible government actions, such as freezes or domestic debt repudiation, by increasing prices and promoting capital flight.

As inflation accelerated every month, expectations that it would continue to do so assumed a self-fulfilling character. The economy was headed towards hyperinflation, which materialized in early 1990.

The Summer Plan intended to be very orthodox in its monetary policy. Thus it raised the interest rate to extremely high levels. These reached 16 per cent a month in real terms during the first two months. Subsequently, as economic agents realized the unpleasant arithmetic involved (the high interest would be paid primarily by the state itself, increasing dramatically the interest component of the deficit), the rate of interest was reduced, but it remained very high.

At this moment the fiscal crisis of the state finally became evident to everybody. The government faced increasing difficulty in financing its deficit, whose interest component was now overwhelming (see Table 3.4). The suspension of payments of interest related to the foreign debt, in August 1989, helped very little, since the expectations of the economic agents were already clear: hyperinflation and some form of confiscation of the domestic debt were viewed as highly probable.

Throughout the year the economic agents lived under these two expectations, trying to anticipate the more likely government actions. They strove to protect their financial assets by selling their Treasury bills ('flying from the overnight'), but they had limited alternatives, since the price of others assets, including the dollar in the parallel market, increased considerably. The premium of the parallel market exchange rate over the official one, which used to be around 25 per cent, exceeded 150 per cent several times during the year.<sup>4</sup>

The money supply, which is usually endogenous, in this case was fully passive, increasing automatically as the nominal demand for money increased. When inflation is high and chronic (inertial) the money supply is endogenous, validating price increases, because the alternative of trying to keep it fixed while prices are soaring means a serious liquidity crisis. On the other hand, government is supposed to finance its deficit in the overnight market. Speculation with Treasury bills was very high. Financial intermediaries would often buy Treasury bills without having a final buyer for them. In such a situation the normal procedure would have been for the intermediaries to finance themselves in the money market. But, as they usually would not have sufficient credit for that, the Central Bank would repurchase the Treasury bills. This repurchase, which in the early 1980s was the exception, became the rule in 1986. Paradoxically this was a correct policy, since it reduced speculation and lowered the interest burden of the state. But the consequence was to make the money supply fully passive. Whenever economic agents fled from Treasury bills, leaving the financial intermediaries without reserves, the Central Bank automatically repurchased the bills without costs for the intermediary.

Hyperinflation was the necessary outcome of all these events: the official inflation rate (IPC – Consumption Price Index) was 53 per cent in December, 56 per cent in January, 73 per cent in February and 84 per cent in March. Actually these figures refer in each case to the previous month, given the system adopted to calculate the price index. Thus the new stabilization plan was decided after inflation had reached 84 per cent in February.<sup>6</sup>

## II THE ALTERNATIVES

After the failure of the Summer Plan, the policy-making capability of the Sarney government was exhausted and immobilized. Everyone agreed that nothing more could be expected from it. All expectations were directed to what would be done by the new government that would be elected in December and would take office on 15 March 1990.

During 1989 the economic debate was intense. A consensus was formed about the severity of the crisis, its fiscal character and the need for a profound fiscal adjustment.<sup>7</sup> As the exchange rate, during and after the Summer Plan, was overvalued by around 40 per cent, a consensus was also established about the need for a devaluation of the cruzado. No agreement was reached, however, about two questions: whether a new price freeze and a moratorium of the domestic debt were necessary or not.

The debate about incomes policy divided economists into three groups:

(1) pure monetarist economists who believed that no incomes policy at all was indicated; (2) monetarists who, verifying the high economic or social cost of orthodox policies in a situation of chronic inflation, incorporated some of the neostructuralist ideas about inertial inflation (Blejer and Liviatan, 1987; Kiguel and Liviatan, 1988); and (3) neostructuralist (and post Keynesian) economists who believed that, besides fiscal and monetary policy, a profound economic reform should be combined with a stabilization programme in which a new freeze was a necessary first step.

The pure monetarist view was not considered or defended seriously in Brazil. Although preferring not to say so overtly, most monetarist economists know that, when inflation has a high inertial component, the economic and social costs of a monetary and fiscal shock when not combined with some kind of incomes policy are too high. They prefer to think in terms of liberalization after the shock.

The idea of a gradual deindexation of the economy, with decreasing targets of inflation, had more followers. Experience shows that, when inflation is chronic and reaches high levels, gradualist programmes are ineffective and only shock therapy can work (Yeager, *et al.* 1981; Dornbusch and Fischer, 1986; and the economists who, in Brazil, developed the theory of inertial inflation).<sup>8</sup> The unpopular character of freezes among the Brazilian elites, however, given the failure of the previous ones, was behind the attitude of rejecting a new freeze. On the other hand, theoretically, it is true that inertial inflation can be fought in a gradual administrative way. What was forgotten by these economists is that gradualism is only possible when inertial inflation is in its first stages; it is very difficult and implies an enormous social cost when inertial inflation is over one digit monthly; it is impossible when inflation is nearing hyperinflation.

The unfeasibility of gradualism when inflation is very high is related to the free rider issue. Let us suppose two situations: one where inflation is 4 per cent a month, the other, when it is 80 per cent. In both cases the decision is to reduce inflation gradually, over four months, dividing inflation by half each month and defining guidelines for this reduction. In the first case, the premium of the free rider for not following the guidelines is only 2 per cent, in the second case, 40 per cent; the risk is the same. If, instead of guidelines, the government decided to impose the gradual path, it would have the same difficulties arising from a freeze several times over. Actually these difficulties would be greater because it is easier to control a full freeze than a 'partial' one. In the first case the norm is very simple: prices are supposed to remain the same. In the second the rule may also be clear, but very difficult to be controlled by government officials and economic agents: prices are supposed to be increased according to a pre-established and decreasing rate.



The debate about the need for a moratorium on the domestic debt was focused on two issues: the size of the debt and its maturity. The proponents of a moratorium said either that the debt was the basic cause of the budget deficit, given the amount of interest to be paid, or that there was a great probability that economic agents, victims of monetary illusion, would expend their financial assets (invested in Treasury bills and in savings accounts) as soon as they ceased to see huge nominal increases in their indexed financial assets every month. In this case the reduced nominal rate of interest would lead economic agents to consume or to invest out of their financial wealth, provoking a great increase in aggregate demand just after the price freeze. The Cruzado Plan was presented as an empirical demonstration of this hypothesis.

The first argument on the size of the public debt is very fragile. After a while the domestic debt, although increasing, was not so high. Total Treasury bills represented 6 per cent of GDP in 1979 and near 13 per cent in 1989. To reach 50 per cent of GDP (the total public debt) we have to add around 12 per cent of GDP for domestic debt of state-owned enterprises and for states and municipalities, and 25 per cent of GDP total public foreign debt.

The interest burden on the domestic debt was indeed high. It was around 3 per cent of GDP before 1989. In that year, with the Summer Plan and the loss of control of the economy heading towards hyperinflation, real interest rates paid by the government exploded. The interest rate on the domestic debt jumped to 9.5 per cent of GDP (see Table 3.4).<sup>10</sup>

The true problem with the government debt was the very short maturity of the Treasury bills. They were almost fully financed in the overnight money market, showing that the state had lost creditworthiness – besides the loss of credibility of government. This fact was presented as a second argument in favour of a domestic moratorium. Indeed economic agents could decide to change into consumption or investments their liquid financial assets at the moment that its nominal valorization stopped. But this was just a possibility, not a necessity. After the 1987 freeze there was not a flight from the money market towards real assets. The costs and risks of such a flight are very high. If this flight occurs, as happened in 1989 for fear of hyperinflation and of a domestic moratorium, the cost and risk of buying overvalued real assets (dollar, gold, real estate) are very high. Actually in these circumstances the degree of economic freedom of economic agents in relation to their portfolios is rather small.

Taking this into consideration a group of economists, among whom we are included, rejected the idea of a domestic moratorium as a first step, not only because the measure was too risky (a no-return policy) but especially because it could endanger the creditworthiness of the state and the confi-



dence in the financial institutions. If, after the decision on fiscal adjustment and on a new freeze, economic agents started to divest from their financial assets, causing an undesired and uncontrollable increase in aggregate demand, in spite of the adoption of a rigid but conventional monetary policy (high interest rate), it would be possible to add a domestic moratorium to the stabilization programme.

### III THE LOGIC OF THE MONETARY REFORM

The stabilization plan – the Collor Plan – that was adopted by the new government in its first day in office (16 March 1990) included four sets of short-term measures: (1) a monetary reform, that included the blockage of 70 per cent of the financial assets of the private sector; (2) a fiscal adjustment; (3) an incomes policy based on a new price freeze; and (4) the introduction of a floating exchange rate. Its medium-term policies were liberalization of foreign trade and privatization.

The four sets of short-term measures were important, but the actual emphasis of the stabilization programme was on the domestic moratorium, which represented an attempt to control inflation through a radical monetary constraint.

The monetary reform had some similarity to the reforms made after the Second World War in Japan, Belgium, West Germany and other European countries. It included, however, specific features. Instead of establishing a conversion factor larger than one between the old money (the novo cruzado) and the new money (the cruzeiro),<sup>11</sup> around 70 per cent of M4 was blocked in novos cruzados (that could only be used to pay past debts), whereas 30 per cent was immediately converted into cruzeiros.<sup>12</sup> While in Germany the Reichmarks ceased to function as a currency, the novos cruzados, besides being used to pay debts previous to 16 March, are supposed to be redeemed in 12 tranches, with full monetary correction and 6 per cent annual interest rate, after 18 months.

This 30 per cent conversion in cruzeiros was the weighted result of the conversion of 20 per cent of all financial assets (money market, time deposits and even checking accounts balance) except savings accounts, where the conversion was limited to 50 000 cruzeiros. The same rules were valid for individuals and business firms, whereas in Germany, for instance, firms received, besides the Deutsche marks corresponding to the exchange factor, 60 Deutsche marks per employee (the same minimum amount that each individual would receive).

Why was the decision on such a radical domestic moratorium taken? We have already seen that, if the problem was the possibility of economic

agents divesting from their financial assets, the moratorium could be decided immediately when this possibility materializes. We are convinced, however, that the fundamental reasons that led the new economic authorities to decide upon the moratorium were different. They were confronted by the unfeasibility of a drastic fiscal adjustment in a very short time. Besides, they supposed that the monetary crunch would defeat inflation.

This is the real logic of the domestic moratorium. The medium-term necessary fiscal adjustment that would be proportionate as small fiscal surplus would be around 7 per cent of GDP per year. This figure may be explained in two ways: in fiscal terms and in national account terms. In fiscal terms or in public sector borrowing requirements terms the operational public deficit of Brazil in 1987 and 1988 averaged 5 per cent. In 1989 there was an increase to 12.4 per cent.<sup>13</sup> But this figure overestimates the Brazilian permanent deficit, given the exceptionally high interest paid by the state that year. In national account terms we can come to a similar figure, considering that public sector savings are negative around 3 per cent and should be positive around 4 per cent of GDP to finance essential government investment programmes. According to this second reasoning it is clear that we are assuming that the fiscal adjustment cannot impose further reductions in public investment. Fiscal adjustment will have to be made by increasing taxes and cutting current expenditures.

The objective should be a small budget surplus, given that, during the transition to stability, the government would be forbidden to resort to domestic or foreign additional finance. After stabilization the budget surplus would provide government with some degree of freedom to stimulate aggregate demand and resume growth with stability.

It is quite clear today that, given the political and constitutional limitations it faced, the new government did not have the power to impose such fiscal adjustment in the required time. The Constitution establishes the principle of annuity for income taxes. In political terms, there is not enough support in Brazil, either in Congress or in the business elite, for sizable taxes increases.

#### IV INSUFFICIENT FISCAL ADJUSTMENT

It is not easy to calculate the size of the fiscal adjustment embodied in the plan. The government spoke about a 10 per cent adjustment, but this is clearly an overstatement. On the other hand, it is essential to distinguish permanent adjustment from once and for all adjustment. In Table 3.5 we present an estimate of the fiscal adjustment presented by the Ministry of the Economy (*Gazeta Mercantil*, 18.4.90).

Table 3.5 Fiscal adjustment estimated by the plan (% GDP)

Permanent adjustment		3.9
Revenues		
Consumption tax	0.6	
State-owned enterprises prices	0.5	
Tax evasion	0.5	
Expenditures		
Interest reduction	1.5	
Expenditure reduction	0.5	
Olivera-Tanzi effect	0.1	
Other	0.3	
Once and for all adjustment		6.0
Capital levy (IOF)	2.5	
Privatization certificates	2.0	
Privatization	1.5	
Total		9.9

It should be noted that almost two-thirds of the gains (6 per cent of GDP) refer, not to a permanent fiscal adjustment, but to once for all gains (particularly the IOF – Imposto sobre Operações Financeiras – and the sale of public sector assets). These 6 per cent estimated gains are not yet assured. In relation to the permanent adjustment, the tax reform implemented by the Collor Plan will increase the federal government revenue by only 1.3 per cent of GDP in 1991. Although small, the reduction in expenditures is also not yet assured.

This fiscal adjustment is clearly insufficient. The new Ministry of the Economy already acknowledged this fact when it announced that a new fiscal package was under study to be sent to Congress. Anyway it is clear that the domestic moratorium played the role of a provisory substitute for the fiscal adjustment. Deciding on the domestic moratorium the government won time to lengthen its fiscal adjustment in the future.

It is important, however, to underline that a stock measure like this is not a real substitute for a flow fiscal adjustment, nor should it be confused with a monetary policy that effectively controls the flow money supply. The radical reduction of the stock of money could have had some flow (fiscal and monetary) consequences in terms of reduction in interest, but this did not happen. The domestic debt was blocked and slightly reduced, not cancelled.

There was some reduction in the stock of debt. Three days of banking holidays, when monetary correction was not counted on Treasury bills, represented almost an 8 per cent reduction. The capital levy (IOF) represented a reduction around 9 per cent of the stock of government debt. And some reduction was also achieved by less than proportionate correction

for financial assets in March 1990 (BTN was limited to a 41 per cent increase).<sup>14</sup>

This limited debt reduction plus the forced reduction of the interest rate on the blocked public debt caused some interest reduction for the public sector. But it is quite clear that the domestic moratorium is not a substitute for fiscal adjustment.

To complement and to lengthen the fiscal adjustment is now an essential task for the economic authorities, since the success of the plan depends on not having to rely on inflationary financing. The public deficit was not the direct cause of Brazil reaching hyperinflation. Given chronic or inertial inflation, often the public deficit was a convenient manner of validating the money supply increase necessary to comply with the transaction demand for money (Bresser Pereira and Nakano, 1987, pp. 73–9). But once the time for stabilization comes, there is no other alternative to eliminating the public deficit.

## V THE LIQUIDITY QUESTION

A stabilization programme usually involves a certain degree of recession of the economy, even if the previous inflation cannot be directly attributed to excess demand. Fiscal adjustment and monetary control have a recessive character. The control of wages requires some degree of slow-down of economic activity. The need of firmly fixing a nominal anchor (usually the exchange rate) requires a previous over-devaluation which induces contractionary forces. If a freeze is included in the stabilization plan, a weak aggregate demand will facilitate the subsequent price liberalization.

In the Collor stabilization programme there was assumed as an objective – or as a necessary consequence – a moderate recession. The general and correct idea was that it is impossible to stabilize an economy so deeply unbalanced without some sacrifice. The instrument to impose this sacrifice, however, was rather the reduction of money supply than fiscal adjustment. And this reduction was so radical, it hit the business enterprises so strongly, that it disorganized production and is leading the economy to a much deeper recession than expected or desired, without achieving the control of inflation.

In the first 60 days after the plan the attention of the public and the economists was very much directed to the 'liquidity question'. First, the sharp reduction of liquidity was said to be both the cause of the stabilization and the reason for recession. Second, when the money supply began to increase, it was made responsible for excess demand and/or the resurgence of inflation. Our view is, first, that recession was rather the result, at

the supply side, of the disorganization of production, caused by the blockage of financial assets including the blockage of working capital, than the consequence of the reduction of liquidity provoking a fall in demand; second, that the increase in money supply that immediately followed was a clear demonstration of the endogenous character of money supply; and third, that the resurgence of inflation cannot be related to this increase. In this section we will discuss the first two points, the third will be discussed in section seven.

According to neostructuralist and post Keynesian economics the money supply is endogenous.<sup>15</sup> It is basically determined by the demand for money, accommodates the increase of GDP and validates the rate of inflation.

The government budgetary constraint, in a closed economy or in a highly indebted economy, requires that the fiscal deficit be financed by the net creation of government liabilities: increase in the money supply,  $dM$ , and issue of Treasury bills  $dB$ .

$$D = dB + dM$$

Conventional economics assumes that in this equation either  $dM$  or  $D$  are the exogenous variables. When  $D$  is the determinant factor, the increase of money supply is a residuum, given the government incapacity to finance fully the deficit with Treasury bills. If this is not necessarily true when moderate inflation prevails, it is clearly invalid when inflation is very high and chronic or inertial. In this case the money supply – and thus  $dM$  – is determined by the demand for money, and the increase in government indebtedness is the residuum. In Brazil, before the stabilization plan, the Central Bank projected the rate of inflation and, passively, established the required increase in the nominal supply that would keep it balanced with the demand for money or, in other words, that would avoid a liquidity crisis. This practice was adopted independently of the orientation of finance ministers and Central Bank governors.

Actually, in the case of Brazil, where, besides a chronic inflation the economy was fully indexed, the endogenous money supply should include a portion of the Treasury bills traded in the overnight market. The maturity of Treasury bills was one night. And government, in order to reduce its interest bill and to induce financial intermediaries to buy the Treasury bills, warranted the automatic and daily repurchase of Treasury bills that did not find buyers among the public. In this way the interest rate was fully determined by the Central Bank, and the money supply was fully endogenous.

As a consequence the overnight deposits represented a quasi-money,

besides a remunerated money. The potential money supply was near to M4, since all financial assets were extremely liquid, but actual money supply was really formed of M1 plus a part of the overnight deposits. The conventional concept of money supply makes it equal to M1. In equilibrium we have,

$$M^d = Yp/V = M1$$

where  $M^d$  is the demand for money,  $Yp$  nominal increase,  $V$  the income velocity of money, and  $M1$  the money supply.

In a situation of high inflation,  $V$  would increase sharply while the conventional supply of money would be much smaller. The actual velocity of money, however, does not increase so much as it seems, because the actual money supply cannot be equated with M1. The actual money supply,  $M'$ , should be considered as formed of M1 plus a portion,  $z$ , of the overnight deposits,  $B$ . The  $z$  coefficient, smaller than one, is determined by the rate of inflation and the corresponding nominal demand for money. The higher inflation, the higher will be  $z$ . This share,  $zB$ , of overnight deposits is the amount of money that economic agents indeed use as money. It is also the variable that, endogenously, equates the actual money supply with the demand for money. In this case, the actual income-velocity of money,  $V'$  is smaller than when we take the conventional or restricted definition of money, M1.

$$M'^d = Yp/V' = M1 + zB = M'$$

In this equation  $zB$  is used as money just as M1; it is as much a means of exchange as conventional money as currency. Economic agents habitually use part of their overnight deposits,  $zB$ , to make transactions. To do that they transform  $zB$  into M1 daily, increasing M1, but, as the recipients of the additional M1 invest it immediately in overnight Treasury bills, the M1 increase is automatically neutralized, disappearing from records – but not from the economic process.

Table 3.6 presents an estimation of the actual money supply as a proportion of GDP for Brazil at three points: 15 days before the stabilization plan, 15 days after and 45 days after. We have to admit that the estimation of the actual money supply is rather imprecise, but not arbitrary.

Before the plan this estimation was very difficult because the quasi-money stock,  $B$ , from which could be withdrawn the actual money supply, was very big. We estimate that the actual money supply should be around 14 per cent of GDP. To come to this estimation the parameters we have



Table 3.6 Money supply (% of GDP)

	28 Feb	31 March	14 May
1 M4 (potential money supply)	29.0	9.0	14.0
2 B overnight dep.	16.0	2.0	8.0
3 Savings accounts	9.0	3.0	1.0
4 Others	2.0	1.0	1.0
5 M1	2.0	3.0	4.0
6 zB	12.0	2.0	6.0
7 Actual money supply	14.0	5.0	10.0

Table 3.7 Financial assets (% GDP)

	Monet. base	M1	Treas. bills	Saving depos.	Time depos.	M4
1970/74*	4.65	15.04	5.08	1.68	3.28	25.08
1975/79*	3.75	11.70	6.85	5.62	4.44	28.60
1980/84*	2.50	6.30	5.80	8.01	4.57	24.69
1985	1.56	3.73	10.39	9.20	6.17	29.50
1986	3.22	8.20	9.33	8.09	6.05	31.67
1987	2.19	4.62	10.07	9.69	4.86	29.24
1988	1.39	2.76	12.22	10.75	4.11	29.85
1989	1.26	2.05	13.94	8.13	2.78	26.89

Annual average, adopting end of period positions.

\*Average of these years.

Source: Central Bank.

are: M1 was around 17 per cent of GDP in the early 1970s, when inflation was moderate but not negligible (20 per cent a year) and it was reduced to 2 per cent of GDP at the beginning of 1990 (see Table 3.7).<sup>16</sup> In our concept of actual demand for money the demonetization caused by the acceleration of inflation is neutralized by the increase in zB that is considered as part of the actual money supply. But we admit that inflation and financial innovations allowed for some reduction of the demand for money from the 17 per cent of the early 1970s to 14 per cent of GDP in the 1980s. Of this 14 per cent, 2 per cent was represented by M1 and 12 per cent by zB. As B was 16 per cent of GDP, we are assuming a z of 0.75.

With the moratorium of the domestic debt, the supply of money was reduced drastically. M4, which we may understand as a potential money supply, was reduced from 29 to 9 per cent of GDP, overnight deposits, from 13 to 3 per cent of GDP, and our estimation is that the actual money supply decreased from 14 to 5 per cent of GDP. At this stage (31 March) we are assuming that z is equal to one; that is, that the total overnight

deposits are part of the actual money supply.<sup>17</sup>

Such a reduction was not in the minds of the authors of the plan. They confused the amount of cruzeiros left in the economy (9 per cent of GDP) with the money supply. They said (in several interviews in the newspapers) that, in the second semester of 1986, after several months of price stability resulting from the Cruzado Plan, M1 was 9 per cent. Thus 9 per cent of 'money supply' would be enough. Actually the supply of money, even if we include the overnight deposits, was only 5 per cent. On the other hand, the demand for money was at least 14 per cent. In the Cruzado Plan period it was possible to live with a smaller M1 because there was an enormous amount of overnight deposits at the disposition of economic agents.

The effect of this reduction of the money supply on the business enterprises was dramatic. It disorganized production. The working capital of enterprises was blocked, causing an immediate termination of activities. The blockage was made without an economic criterion. Thus the disparities of situation among enterprises were considerable. The prospect was that banks would make the cruzeiros circulate, but, given the high interest rates, this role was only played by the banks to a limited extent.

According to a survey conducted by the FIESP (Federação das Indústrias do Estado de São Paulo), sales of the industrial firms in São Paulo, in the second half of March, were reduced by around 70 per cent. This fact was the result not only of lack of money (globally and sectorially) and of the disorganization of the economy, but also of psychological influences. The impact on expectation was very negative. Unemployment immediately began to rise. Many enterprises decided to send their employees on collective vacations while waiting for a clarification of the situation. Workers began to accept wage reductions coupled with a reduction of the working day.

In the next month the amount of cruzeiros was increased by various means, reaching 14 per cent of GDP in mid-May (in mid-June, 16 per cent). Part of this increase was under the control of government, part not. The government assumed that it would be able to control the increase of liquidity, but the market, taking advantage of the existence of two currencies, was able to increase its amount of cruzeiros, reducing correspondingly the stock of cruzados.

At this moment banks began to make it known that they were having difficulty in making loans, given a reduced demand for them. Several analysts and the economic authorities concluded that 'the liquidity problem' was solved – more than that, that there was now 'excess liquidity', which would provoke excess demand and/or bring back inflation.

It is easy to note in Table 3.6 that in mid-May the potential money supply (M1 plus overnight deposits) continued to be relatively small (10

per cent of GDP), and that the actual money supply, although increased, was still below the level previous to the plan (around 10 per cent in May, against 14 per cent of GDP in February).

Why, then, was the demand for loans weak? Why was the liquidity no longer tight but relatively loose? The increase in the money supply explains part of the change, but the real explanation is in the reduction of demand for loans. Given the pessimistic prospect about sales and the high interest rates (around 100 per cent a year in real terms), firms were not interested in taking loans.<sup>18</sup> They would rather reduce production. As a matter of fact, recession was most likely already installed in the economy. The demand for loans and the demand for money were reduced in accordance with the pessimistic expectations of economic agents.

## VI THE DEMAND PROBLEM

Recession in this case was not demand-led but supply-originated. Its basic cause was not a reduction of aggregate demand, but the disorganization of production. Retail sales were the only indicator that initially did not point towards recession. They increased immediately after the freeze, as happened after the other three freezes. There are some general reasons to explain why this happens. First, although we have already said that this fact is often overemphasized, it is true that, with the end of money illusion, people tend to spend a little more for consumption. Second, either out of optimism or mistrust in the success of the stabilization, people tend to spend on consumption in anticipation of needs. Third, Helpman (1988) argued that a price freeze in an oligopolized economy has a similar effect to a reduction of real prices; thus demand will increase along the demand curve.

In the Collor Plan there were three additional explanations for the increase in consumption: first, the loss of credibility of financial assets led people to consume; second, the resumption of consumer credit, which had practically disappeared with hyperinflation, spurred sales of consumer durables; third, the plan implied a real wage increase in March of 23 per cent.

This 23 per cent real wage increase took place in March because the government decided that the 73 per cent February inflation should correct wages in March, according to existing wage indexation law. On the other hand, inflation in March, when calculated at end of the month against end of the previous month (instead of average of the month against average of previous month, as price indexes usually do) was only 41 per cent in March.<sup>19</sup>

**Table 3.8** *Indicators of economic activity in 1990 (% change in relation to previous year)\**

	<i>Level of activity</i>	<i>Level of employment</i>	<i>Average real wage (1)</i>	<i>Installed capacity utilization</i>
Jan	6.2	3.8	-18.8	79.5
Feb	8.0	3.4	-22.7	79.0
Mar	-6.8	2.5	-10.5	72.5
Apr	-22.3	0.6	-22.4	62.5

\*Except installed capacity utilization.

(1) Average nominal wage deflated by IPC/IBGE  $t+1$ .

Source: FIESP (data for São Paulo industry).

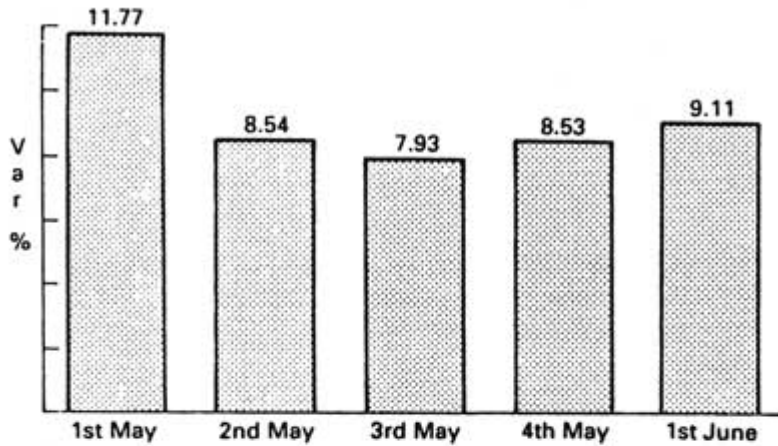
The 23 per cent increase could be interpreted as a basic contradiction of the stabilization plan (Sylvio Bresser Pereira, 1990). Usually to fight inflation means to reduce demand and, if possible, to increase supply. In the Collor Plan the opposite was done: supply was curtailed through the money supply squeeze, while wages were increased. The problem, however, is less serious because, differently from what happened under the Cruzado Plan, and similarly to the Bresser Plan, real wages were decreasing before the plan owing to the acceleration of inflation. Thus the 23 per cent wage increase only compensated the previous reduction.<sup>20</sup> It did not represent a distributive incompatibility. Firms did not *have* to increase prices compensatorily.

This increase in consumption was necessarily short-lived, given the rise in unemployment. In May retail sales, when compared with the corresponding month in the previous year, were already negative in Brazil. Given the reduction of production and of investments a depressed demand was now becoming a generalized fact.

## VII RECESSION AND THE RESURGENCE OF INFLATION

Ninety days after the Collor Plan was launched recession continued to be the most likely outcome, while it was quite clear that inflation was back. Actually the slow-down of the economy had begun earlier. GDP growth was already slightly negative in the last quarter of 1989 (-0.3 per cent) and clearly negative in the first quarter of 1990 (-2.4 per cent). In April, as a result of the disorganization provoked by the Collor Plan, the FIESP index of economic activity showed a 22.3 per cent fall in relation to April 1989; for February and March the corresponding figures were an 8.0 increase and a 6.8 decrease (see Table 3.8). According to the Getúlio

Figure 3.1 Four weeks' inflation (%)



Source: FIPE/USP, cost of living index.

Vargas Foundation business survey the level of capacity utilization of the Brazilian industry in April was the lowest since this index began to be calculated in the mid-1960s (61 per cent); three months before, in January, it was 79 per cent. In May, as the economy started reorganizing after the shock, the level of production began to recover, as the first figures on electric power consumption indicated, but the May record increase of unemployment in São Paulo in relation to the previous month (2.4 per cent against 2.2 per cent) suggested that the recovery was limited. In this month, according to ABDIB (Associação Brasileira da Indústria de Base) the rate of idle capacity in the heavy capital goods industry reached a 48.6 peak against an average, for the 1980s, of 38 per cent. The recession trend seemed to be stronger than the recovery impulse. As to inflation, there is no doubt that it is back. Regular price indexes are inadequate to measure inflation after a freeze because they include a heavy inflation residuum, as they compare present month average prices against last month average prices. In consequence it takes some time for the index to show the halt to inflation. Up to May these average against average price indexes were still showing a fall (see Table 3.3). FIPE's four weeks' price index, however, was already beginning to indicate an increase (see Figure 3.1). Any doubts about the resurgence of inflation, however, were dismissed by FIPE's end to end price index. It was only calculated for two months, showing a clear increase from 3.3 per cent in April to 6.4 per cent in May (see Table 3.9).

Why did inflation reassert itself? There are three explanations for the

*Table 3.9 Monthly inflation rate (1990) (end to end of the month)*

<i>Month</i>	<i>Var. %</i>
February	84.3
March	41.0
April	3.29
May	6.36

*Source:* First two months: estimate of the authors based on IPC/IBGE; last two months, FIPE/USP.

fact: monetarist, Keynesian and neostructuralist or inertialist. The monetarist and the Keynesian reasoning depends on the increase of the money supply in the three months that followed the plan. The neostructuralist analysis is based on the relative price imbalances and on the corresponding distributive conflict. Government adopted a naive monetarism when it assumed that the drastic money supply reduction would eliminate inflation. In doing so they forgot that inflation is not a stock but a flow problem. In order to control inflation it is necessary to eliminate the budget deficit and to control the money supply, not the stock of money. When inflation has an inertial component, as is the case of Brazil, it is necessary, additionally, to freeze prices or, more broadly, to promote an incomes policy that supports (it does not replace) fiscal and monetary policy. For the authors of the Collor Plan the freeze was considered an accessory measure. The essential would be, in the first phase, the reduction of the money supply, and in the second phase, the elimination of the fiscal deficit. However inflation was back before the deficit could be controlled.

The true monetarist explanation for the resurgence of inflation is simple: prices increased again because in the two months following the plan high-powered money increased four times. The liquidity increase provoked expectations that inflation would return – and the 'rational expectation' is a self-fulfilling prophecy. Monetarists do not accept that the money supply has an essentially endogenous, passive character and forget that, after a hyperinflation, a sudden stabilization provokes a strong increase of the monetary base. For the neoclassic monetarist the belief that the increase in the money supply causes inflation has a quasi-religious character. The monetarist rhetoric – 'true' because part of mainstream economics – says that an increase in the money supply causes inflation; rational expectations theory adds that economic agents will form their expectations according to the 'true' theory and, again rationally, will behave according to their expectations, increasing prices. Thus the prophecy becomes self-fulfilling.

The monetarist explanation is implicit in most analysis. Pastore (1990)



adopted it explicitly. Excess demand is not required for the resurgence of inflation. It is enough to have the increase of high-powered money. To be correct this explanation for the acceleration of inflation immediately after the Collor Plan would have been the result of the decisions of the business enterprises to increase their prices as they noticed that the monetary base was increasing. The textile industry, the suppliers of personal services, farmers, the home appliance industry – the first to increase their prices after the plan – would have taken this decision after an assessment of the increase of the monetary base.

The Keynesian explanation is more reasonable, but in the present case accounts only for part of the acceleration of inflation. According to this view, adopted among others by Toledo (1990), inflation returned because the money supply increase would have caused excess demand. The halt of inflation due to the liquidity shock would have been temporary. As liquidity was re-established, demand recovered and inflation returned. Actually we have already shown that the trend was rather to recession than to growth. There was an increase in retail sales in the first month after the plan, but soon sales slowed down. Some firms may have profited from this demand spurt to increase their prices, but only a few, since global demand was dwindling rather than expanding.

The neostructuralist or inertialist explanation for the resurgence of inflation is based rather on the nature of inflation in Brazil than on the errors related to the money supply. Inflation in Brazil is inertial, and was very high – actually hyperinflation already prevailed – when the stabilization plan was launched. The neostructuralist explanation emphasizes relative prices imbalances on the day of the freeze and the corresponding distributive conflict. In Brazil economic agents are used to inflation. They deeply believe that increasing price is the best way to protect themselves from the generalized distributive conflict. On 16 March, when prices were frozen, relative prices were necessarily unbalanced, since price adjustments were not synchronized. Thus there was an intertemporal relative prices imbalance. This imbalance, that may be measured by the dispersion of relative prices, tends to increase with the acceleration up to the moment that the economy is fully dollarized.

On the day that the freeze was implemented firms that had just increased their prices gained from the freeze, as their mark-up increased, while the ones that were on the point of doing so lost. When inflation is chronic, firms that lost – or that presume they have lost – from the freeze will increase their prices at the first opportunity. In the Collor Plan firms felt additionally injured by the retention of financial assets. This was a second reason to increase prices at the first opportunity.

Some factors favoured the price increase: (1) the increase in consump-

tion expenditures just after the freeze; (2) the increase in the money supply that followed the recession; (3) the hasty liberalization of prices of clearly oligopolist industries. These were the opportunities business enterprises were waiting for. But the price increase would have taken place anyway, given the inertial character of the Brazilian inflation. The freeze and the blockage of financial assets induced a one-month truce. But immediately afterwards business enterprises began to increase prices. Nobody can lose with inflation or with a stabilization plan. Either profits or wages cannot be reduced for a while. It does not matter that it is impossible to stabilize the economy without some recession that will reduce profits and wages. A few days after the freeze firms, according to *Gazeta Mercantil*, the leading Brazilian business newspaper, 'were looking for an index for their prices'. Fearing unemployment workers halted their demands for a while, but two months after the plan they were already making huge demands and getting wage increases of 20 to 30 per cent.<sup>21</sup> Firms that agreed to these wage demands will almost certainly pass on the corresponding cost increase to prices.

It is important, however, to underline that since 1987 indexation in Brazil no longer means increasing prices according to past inflation. Economic agents are so worried about not losing with inflation that they either change indices to get a more favourable one, or they 'index' their prices according to their own prediction that inflation is accelerating. In other words, they tend to include a risk premium relating to the previous month's inflation in their price decisions. As all firms behave similarly, each firm individually does not need to worry that its price increase will not be followed by the competition. Thus inertial inflation will be also, and paradoxically, an accelerating inflation.

## VIII ADDITIONAL ISSUES

The failure of the Collor Plan to control inflation may be related to some additional issues. Stabilization of chronic or inertial inflation requires a nominal anchor, besides some type of incomes policy (Kiguel and Liviatan, 1988). The end of hyperinflation usually took place when the exchange rate was stabilized. In Brazil, given its relatively closed economy, the exchange rate is not so important as in other countries. But a fixed exchange rate would certainly be an important reference for expectations formation. The Collor Plan, however, decided in favour of a floating exchange rate. It is true that market clearing for this floating exchange rate is very limited. The demand for foreign currency continues to be under the control of authorities: administrative import controls were maintained

and payments of interest, dividends and all other capital movements continue under control of the Central Bank. Thus the possible advantages of a floating exchange rate are not present, whereas the disadvantages – the lack of a nominal anchor – are quite clear. The advantages are not present because the Brazilian economy really cannot afford a 'dirty' floating rate. It can live with a 'very dirty' floating rate (the Collor Plan option) but this is clearly a dangerous option. Government renounced a nominal anchor, and the exchange rate was exposed to unexpected and undesired fluctuations. If, for instance, international reserves are increasing because of a moratorium on foreign debt (the present situation of Brazil) the exchange rate will tend perversely to become overvalued. A safer alternative would be a competitive but administered exchange rate, that, after a radical stabilization plan such as the Collor Plan, should have been fixed.

The difficulties the Collor Plan is presently facing also have their origin in the problems that have not been directly faced. Three problems fall into this category: foreign debt, trade liberalization and a social and political pact. The preliminary information about the Collor policy in relation to the foreign debt is reassuring. The decision is first to make an agreement with the International Monetary Fund (IMF) and only after to negotiate with the banks. In the negotiation the basic ideas are to subordinate the payment of interest to the fiscal problem and to have as a parameter for the necessary debt reduction the secondary market price of the Brazilian debt. Actually there is not very much to negotiate with the banks. A reduction of 50 to 60 per cent in the foreign debt will allow a fiscal gain of 1.5 per cent of GDP. Following a burden sharing policy, this is the minimal contribution foreign banks can make to the Brazilian stabilization programme. The problem is to know if the Brazilian government will act firmly and quickly in this direction, deciding quasi-unilaterally the debt reduction and eliminating from the budget and from balance of payments accounts the reduced part of the debt. The alternative is arrears, which have very negative effects on expectations of economic agents.

The same reasoning applies to the trade liberalization issue. The government has already made clear its intention of liberalizing imports, but present prospects are for a gradual liberalization. Gradualism in this matter will not help the stabilization programme. It will not help to control oligopolies organized in cartels, which prevail in Brazil. Besides gradual policies in this matter seldom succeed. Interest groups will have time to react and stop the process. A World Bank-conducted survey of 37 successful experiences of trade liberalization showed that a condition for success was to begin the process with a radical move (Papageorgiou, Choksi and Michaely, 1990).

Finally we have the political problem. The Collor Plan was an authori-

tarian plan produced at a time when consultation and agreement were expected. Nobody was consulted. No previous negotiations took place. Up to the present moment the government has negotiated very little with Congress – where the plan was approved – and with workers. It is unrealistic to assume that workers will readily accept the plan for the simple reason that wages have been partially preserved. A basic cause of the acceleration of inflation in Brazil in recent years, besides the intertemporal distributive conflict among business firms, which originated in the asynchronous increase in prices, has been the distributive conflict between labour and capital. At the present time workers are making it quite clear that they are not convinced that their wages have been preserved. As with previous plans, they claim that the inflation of the month of the freeze (March, when official inflation was 84 per cent) was 'stolen' by the government. The claim makes no sense, the economic reasoning behind it is unsustainable, but, since no political or social agreement was tried, the probability of great labour and political disputes in the near future is very high.

To conclude: the Collor Plan was not able to control inflation. The Collor government failed in the first trial. But it will not be the last one. The times of chronic inflation are ending in Brazil. After the brief Brazilian experience with hyperinflation it seems clear that the control of inflation will have high priority in the Collor government. The first Collor Plan counted too much on the drastic reduction of the money supply. On the other hand, some mistakes related to the money supply and to wages, an incomplete fiscal adjustment, a wrong view of the exchange rate, the natural difficulties involved in getting out of a freeze in conditions of unbalanced relative prices, the delay in facing the foreign debt problem and in liberalizing trade, and finally the lack of a real social and political agreement worked against it. Once more the worst enemy of stabilization plans in Brazil – inertial inflation – was not defeated.

In mid-May, when it became clear that inflation was back, the government took the decision to control it by adopting a rigid monetary policy. A nominal anchor was defined. M1 is not supposed to increase by more than 9 per cent up to the end of the year, while wage indexation is barred. In the first month, at the time of writing, the Central Bank was able to control the money supply, but wages were being informally indexed, and inflation was continuing. Monetary authorities are once again underestimating the inertial and accelerating character of Brazilian inflation. Inflation is now nearing 10 per cent a month and most probably will continue to rise. Orthodox stabilization policies are costly and ineffective when inflation is high and has a strong inertial component, as is already the case of Brazilian inflation in June 1990.

A new stabilization plan will have to be started in the coming months.

The fight against inflation will be lengthy and hard. In order to succeed the new plan will have to be carefully prepared, it will have to be preceded by a social pact, and it will necessarily put together incomes policy and conventional fiscal and monetary policies.

## NOTES

1. Transference of real resources is equal to current account minus factor payments (interest and dividends) or it is equal to real transaction surplus: surplus in the trade account plus the balance in real services account.
2. We exclude the Bresser Plan from these consequences because it was an emergency plan enacted in order to control the deep crisis of the failure of the Cruzado Plan. It did not intend to finish with inflation but only to put a halt to it for a moment. It did not include a monetary reform, the de-indexation of the economy and the freeze of the exchange rate, unlike the other plans. Launched in June 1987, it assumed that in December inflation would reach 10 per cent; actually it reached 14 per cent that month (Bresser Pereira, 1988b).
3. In this table we use the IGP/FGV because it is an index that has a consistent and long series, whereas the official consumer price index IPC/IBGE, that we often use in the text, was subjected to methodological changes (vectors) in the 1986, 1987 and 1989 freezes.
4. Actually this spread varied strongly during the year, as successive speculative attacks against the novo cruzado raised it. The government responded to these attacks with its only and self-defeating weapon: the increase of interest rates.
5. The difference between the public deficit (public sector borrowing requirements in operational terms) and the public sector interest burden is the primary or non-interest deficit. Only in 1987 and 1989 did Brazil present a primary deficit.
6. The IPC for a given month,  $m$ , is calculated taking the average prices between the sixteenth day of  $m-1$  and the fifteenth of  $m$ , and comparing them with average prices collected between  $m-2$  16 and  $m-1$  15. Thus the IPC for month  $m$  is actually an approximation of the price increases taken place in the previous month,  $m-1$ .
7. This consensus was only broken by a few populist economists who either insisted that a budget deficit is acceptable when there is no full employment (actually Brazil was near full employment in 1989) or said that to reduce the stock of public debt was a more effective way to stabilize the economy than to cut the budget deficit, which was essentially a financial or structural deficit.
8. To quote only the first complete statements about the theory of inertial inflation in Brazil: Bresser Pereira and Nakano, 1983; Arida and Rezende, 1984; Lopes, 1984).
9. The real interest rate on Treasury bills was high between 1981 and 1984, and in 1988 and 1989, when monetarist policies prevailed. It was low or negative in 1985–86 for populist reasons. At the end of 1986, with the creation of a new system of Treasury bills, whose rate of interest was defined daily (the LBCs, Letras do Banco Central, and LFTs, Letras Financeiras do Tesouro, that replaced the OTNs, Obrigações do Tesouro Nacional), it was possible to limit speculation and to reduce the rate of interest on the overnight market. In 1987 the government was able to pay low interest rates while maintaining a positive interest rate in the financial market. The trade-off was to make the money supply additionally endogenous.
10. The figures in Table 3.4 overestimate the interests on the internal debt and the public deficit. They were calculated by the Central Bank using as deflator the IPC of the month  $t$ . As the acceleration of inflation was very strong in 1989 this methodology is not acceptable. Since the IPC measures inflation with a lag of about one month, an alternative deflator ( $t+1$  IPC) may be used. According to this more correct methodology the interest on the domestic debt will fall to 4.3 per cent of GDP in 1989; for the



other years it will probably turn negative. The public deficit in 1989 will fall to 7.2 per cent of GDP.

11. In the German monetary reform of June 1948, for instance, the conversion factor between Reich marks and Deutsche marks was 10 to 1. Thus 90 per cent of the old Reich marks were confiscated, whereas in Brazil the novos cruzados (the old money) have just been blocked.
12. M4 was NCz\$ 4.2 trillions (US\$ 100 billion, considering the official exchange rate on 16 March of 42.3 cruzeiros per dollar). Around US\$ 33 billion were converted into cruzeiros, initially leaving US\$ 77 billion blocked in novos cruzados.
13. There are no official figures about the operational deficit in 1989, but the estimates are around 7 per cent. Part of this increase can be explained by the extraordinary acceleration of inflation and the active interest policy adopted by the former government.
14. For financial asset holders who made their investment at the end of February this did not represent a loss, since the rate of inflation 'point to point', from 28 February to 31 March, was around 40 per cent. For investors who bought their financial assets before, however, there may have been a loss (that is, the government got a debt reduction) since there was some underestimation of inflation that would be compensated by the official rate of inflation of 84 per cent in March.
15. See Rangel, 1963, Kaldor, 1970; Merkin, 1982; Bresser Pereira and Nakano, 1983; Davidson, 1988. Merkin's paper includes a survey on the subject.
16. We are considering a GDP of US\$ 365 billion dollars.
17. The stabilization plan did not change the rules of the financial market regarding the overnight deposits. It continued to be possible to transfer every afternoon (until 1 p.m.) part of the cash deposits to overnight deposits and have them automatically transformed into cash deposits next morning. Thus the increase of M1 and the reduction of the overnight deposits were smaller than if the government had established a minimum maturity of one week for Treasury bills. If something had been done in this direction the confusion about what is money and what is not would have been reduced, although not eliminated.
18. Real interest rates just after the plan were very high. They went down as nominal interest rate was lowered by the authorities (or by monetary policy). In early May they were still very high. In June, as inflation accelerated and the Central Bank did not acknowledge the fact, they became increasingly low and finally negative.
19. The consumer price index of March, utilizing the traditional methodology of comparing the average prices of the month against average prices of the previous month, was 84 per cent.
20. Average real wages decreased by 22.6 per cent from February 1989 to February 1990, according to the FIESP index of real wages (indexed by inflation of the next month  $(t+1)$  because the consumer price index (IPC/IBGE) has a lag of one month). In March the real wage reduction had fallen to 10 per cent. In June, giving the pressure of unions, the great public issue relating to the plan was the 'compensation of losses' suffered by workers.
21. Workers, acting according to the previous wage law which indexed wages according to inflation (IPC/IBGE) of the previous month, demanded a wage increase of 84 per cent for April and 44 per cent for May (total of 166 per cent), whereas actual inflation, calculated according to the end of the month/end of the month methodology instead of the average of the month methodology, was 3.3 per cent in April and 6.2 in May.

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