MACROECONOMIC STABILIZATION POLICIES AND INSTABILITY IN AGRICULTURE BRAZIL, 1986/92[1]

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ASBRACT - This paper traces the macroeconomic roots of the deterioration of agricultural performance in the crop years 1989/90 and 1990/91. It shows that the increase in inflationary instability after 1986, and the policies adopted by the Government, since then, to fight hyperinflation, caused the terms of trade of agriculture to become much more unstable, at the same time that the government pulled back the support it had been providing to agriculture. These adverse conditions ultimately caused the reduction of activity levels in agriculture in 1989 and 1990. The paper concludes by pointing out the implications for the stabilization strategy.

RESUMO - Este trabalho aponta as raízes macroeconomicas da deterioração do desempenho agrícola nos anos agrícolas de 1989/90 e 1990/91. Mostra-se que o aumento da instabilidade inflacionária depois de 1986, e as políticas adotadas pelo governo, desde então, para combater a hiperinflação fizeram os termos de troca agricultura-indústria tornarem-se muito mais instáveis, ao mesmo tempo em que o governo retirou o apoio que ele vinha prestando à agricultura. Essas condições adversas, em última análise, causaram a redução de atividade na agricultura em 1989 e 1990. O trabalho conclui apontando as implicações para a estratégia de estabilização.

Termos para Indexação - Planos de estabilização, preços relativos agrícolas, produção agrícola.

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[1] Revised and updated version of "Heterodox Stabilization Plans and Agriculture in Brazil, 1986/91." (Rio de Janeiro, may 1992, mimeo).

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1 - INTRODUCTION

The agricultural sector in Brazil has been able to keep itself growing in the 1980's at more or less the same rate of the 1970's, despite the sharp deceleration of the country's economic growth in that decade (Goldin and Rezende, 1990). However, this satisfactory agricultural performance gave way, in the crop years 1989/90 and 1990/91, to a deep crisis of confidence and production in the farm sector. Crop output in 1990 was 10% lower than its 1989 level and did not recover in 1991. Even though the major part of this recent fall of output should be attributed to crop failures that drastically reduced harvested area in 1990 and 1991, there was also a significant reduction in the purchase of modern inputs (including fertilizers, pesticides and improved seeds) in the years 1989-90, not to mention the expenditures on new machinery and other fixed capital goods, whose fall was even greater.

The objective of this paper is to review these recent events and provide an explanation for the sudden deterioration of agricultural performance during the crop years 1989/90 and 1990/91. For this purpose, it will be necessary to go back to as early as 1986 and show how the increase in inflation, and the accompanying macroeconomic and sectorial policies adopted by the Government, have caused a parallel increase in instability of agricultural prices and income (and hence of agricultural incentives). This, in turn, has led both to agricultural euphoria in some years (as in 1986) as well as to the post-1989 downward-adjustment in investiment levels in agriculture. In this way, it will be argued that the farm sector, which had been stimulated and was able to grow during most of the 1980's, became, at the end of this decade, the main victim of rising inflation and the Government's strategy to combact it.

The paper starts, by presenting some basic data concerning both the satisfactory performance during the 1980's as well as the recent agricultural downturn. In addition, it shows the agricultural recovery that took place in the crop year 1991/92. It proceeds by intruducing, in section 3, the evidence of a significant negative correlation between the rate of inflation and the terms of trade Agriculture/Industry, a phenomenon that took place in the period 1986-92 and stood in sharp contrast with previous historical evidence. In view of the

crucial role assigned, in our analysis of the post-1989 agricultural downturn, to the implied instability of agricultural prices and income, the following sections are devoted to the analysis of this phenomenon and its implications. Thus, section 4 presents an analyisis of the mechanisms of hyperinflation and their modified operation in Brazil due to the presence of the so-called "indexed economy". Section 5 shows, then, how this institutional feature of the Brazilian economy made the terms of trade in agricultural fluctuate systematically, as a function, solely, of changes in the inflation rate. Section 6 completes this analysis by arguing that this inflationary process induced the farmers to operate with a higher degree of self-financing and created, therefore, the context for the abrupt fall of agricultural investments in 1989, when agricultural income - following agricultural prices - simply collapsed. Section 7 provides a discussion of the role of exchange rate policy in the period. The last section summarizes the paper and makes some policy recommendations.

2 - The Recent Crisis of Agricultural Production

Table 1 shows that, after growing at the annual rate of 3.2% in the period 1980/89 - a remarkable performance, when compared with the 1.3% growth rate of industry in the same period -, agricultural output fell 3.7% in 1990 and did not recover in 1991 its 1989 level. Crop output fell nothing less than 10% in 1990 and remained at this lower level in 1991, so that almost 20% of the 1989 crop output was lost in the biennium 1990-91.

This recent agricultural downturn reflected a combination of reduced planting and crop failures. Tables 2 and 3 summarize the relevant data for the summer crops (cotton, rice, edible beans, corn and soybeans) and wheat. As Table 2 shows, area planted with the summer crops fell 11% between 1989 and 1991, but output fell 23%. As for wheat, the fall of output in 1990 must be entirely attributed to crop failure, but in 1991 the low level of production was caused by reduced acreage. The regional disaggregation of the data, presented in Table3, on the other hand, shows that the reduction of planted area, in the crop years 1989/90 and 1990/91, hit most the WestCentral past and, to a lesser extent, the Northeast and the Southeast. In contrast, crop failures reached all regions in one of the two crop years above.

Table 1
BRAZIL: INDICES OF REAL PRODUCT - TOTAL, PER CAPITA AND BY SECTORS AND ANNUAL RATES OF CHANGE FOR SELECTED PERIODS, 1980-92

			Agriculture			Industry				Services
	GDP	GDP	Total	Crops	Animal	Total	Manufacturing	Civil	Mineral	
Years		Per Capita			Orign			Construction	Extractive	
1980	100	100	100	100	100	100	100	100	100	100
1981	95.6	93.5	108.0	109.6	105.5	91.2	89.6	93.9	97.5	97.8
1982	96.2	91.9	107.5	105.9	110.5	91.2	89.5	92.0	104.2	99.7
1983	92.9	86.9	106.8	104.0	112.2	85.8	84.2	79.2	120.4	98.9
1984	97.8	89.5	110.4	112.9	105.6	91.5	89.4	79.9	157.1	103.0
1985	105.6	94.5	121.5	127.8	109.5	99.0	96.9	84.7	175.3	109.7
1986	113.6	99.5	111.8	114.8	104.8	110.7	107.8	100.2	181.8	116.7
1987	117.7	101.0	128.5	132.4	120.0	111.9	108.9	101.4	180.5	122.6
1988	117.5	98.8	129.6	130.1	126.3	109.0	105.2	98.4	181.3	125.5
1989	121.4	100.0	133.3	134.3	129.2	112.2	108.2	101.6	188.4	130.3
1990	116.6	94.1	128.4	120.6	137.9	103.9	98.8	93.1	187.1	129.5
1991	117.6	93.0	131.1	122.8	141.3	103.9	98.3	93.4	174.4	132.1
1992	116.5	90.2	139.0	130.8	148.8	98.9	93.5	89.3	164.7	132.0
Annual Rates of Change										
1965/80	8.8	n.a.	3.8	n.a.	n.a.	10.1	n.a.	n.a.	n.a.	n.a.
1980/89	2.2	0.0	3.2	3.3	2.9	1.3	0.9	0.2	7.3	3.0
1989/90	-4.0	-5.9	-3.7	-10.2	6.7	-7.4	-8.7	-8.4	-0.7	-0.7
1990/91	0.8	-1.2	2.1	1.8	2.5	0.8	-0.5	0.3	-6.8	2.1
1991/92	-0.9	-2.9	6.0	6.5	5.3	-4.1	-4.9	-4.4	-5.6	0.0

Source: IBGE

Table 2
Brazil - Summer Crops and Wheat*: Indices of Output and Planted Area, 1988/92

Years	Summer Crops		Wheat	
	Output	Area Planted	Output	Area Planted
1988	96	100	102	103
1989	108	100	98	97
1990	88	91	55	96
1991	83	89	52	59
1992	108	83	25	40

Source of data: IBGE

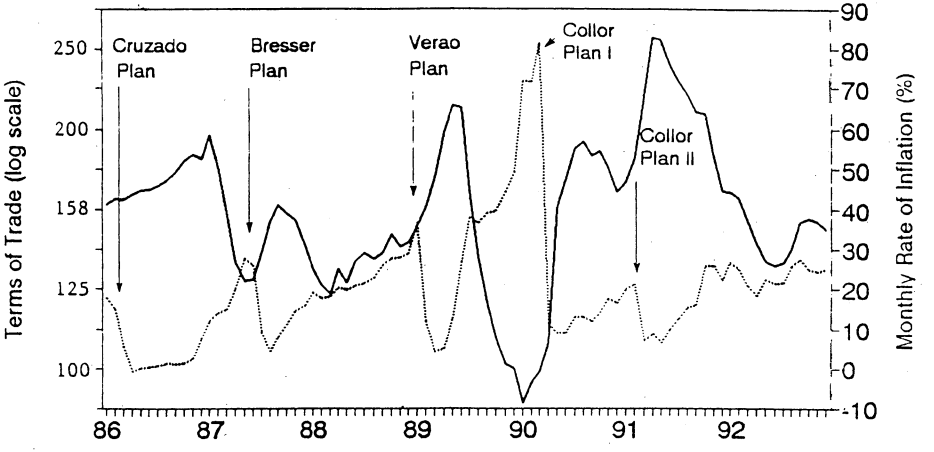
*: The summer crops are seed cotton, rice, edible beans, corn and soybeans. The output is based on La speyres quantum index; the weights are the average prices of the 1985 Agricultural Census and the basis is the simple average of the quantities produced in 1988 and 1989. The indices of area planted are simple aggregative indices, the basis being the average of total planted area in 1988 and 1989.

3 - Inflation and the Terms of Trade Between Agriculture and Industry

Figure 1 shows that there has occurred, since 1986, and with the only exception of 1988, a definitive inverse relationship between the inflation rate and the terms of trade Agriculture/Industry. Regression analysis, whose results are reported in Table 4, confirms the existence of this relationship but shows that a positive association between the two variables existed before 1986.

Is is interesting to note that the pre-1986 evidence presented in Table 4 is consistent with the neo-structuralist analysis of inflation. Even though in the context of this analysis the causality usually runs from agricultural prices to inflation, there is one version of it that also admits the opposite, i.e., that changes in inflation rate cause changes in the terms of trade of Agriculture. In either version, however, a positive association is predicted between the two variables. (For a brief review of this literature, see Rezende, 1992).

Figure 1
Inflation and Agr. Terms of Trade*



- Agr. Terms of Trade - Rate of Inflation -

Source: IBGE

* The terms of trade are the ratio of the respective wholesale price indices of the Getulio Vargas Foundation (i.e., IPA-Ag. and IPA-Ind.), whose General Price Index (IGP-DI) is used for the rate of inflation.

Table 3
BRAZIL - SUMMER CROPS: INDICES OF OUTPUT AND PLANTED AREA BY REGIONS, 1988/92

Years	SOUTH		SOUTHEAST		CENTER-WEST		NORTH-NORTHEAST	
	Output	Area Planted	Output	Area Planted	Output	Area Planted	Output	Area Planted
1988	93	100	102	101	93	100	102	99
1989	110	100	104	99	108	100	103	101
1990	106	98	77	93	76	86	56	82
1991	72	100	99	95	84	74	98	90
1992	106	98	99	90	91	81	74	91

Source: IBGE

* See Footnote of Table 2.

Table 4
REGRESSION RESULTS
Dependent Variable: Terms of Trade of Agriculture as a function of inflation index*

Independent Variables	Periods (Monthly data)		
	1986-93 (March)	1980-85	1970-79
Constant	1.97 (57.6)***	1.89 (99.82)	1.85 (216.2)
Inflation	-0.001	0.02	0.03
Coeficient	(-20.2)	(8.8)	(8.9)
R^2 **	.82	.52	.40

Source: IBGE

* Logarithmic function

** Corrected for degrees of freedom

*** t coefficients.

The question, then, is what explains the change in the sign of this relationship after 1986. The argument to be presented in this paper focuses on two basic changes that ocurred in the Brazilian economy precisely after 1986. In the first place, inflation increased its variability periods of very low inflation rates (brought about by price freezes) alternating with periods when inflation accelerated and hyperinflation became a real threat. This is shown in Figure 2[1]. Under these conditions, the need to hedge against inflation varied wildly from period to period, in response to changing inflationary expectations. In the second place, it was also after 1986 that financial innovations led to the creation of the so-called "indexed capital" (i.e., an inflation-indexed to highly liquid financial asset) in the economy. The following sections will show how these two changes combined to generate the post-1986 relationship between agricultural prices and inflation in Brazil.

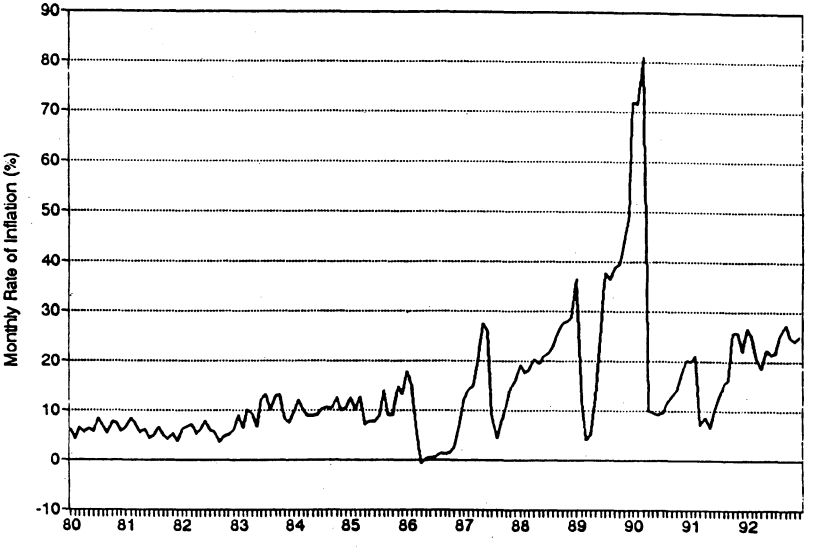
1 The coefficient of variation of the monthly rate of inflation was 86% in the years 1986-91, rising from around 20% in the years 1980-82 and 1983-85.

According to current theory, hyperinflation is explained by the acute fall in the demand for real cash balances and by the consequent impossibility of financing the public deficit through inflation tax. This problem is further aggravated because the public deficit itself rises with inflation (Tanzi effect).

The concomitant impossibility of debt financing is not, however, satisfactorily dealt with in most versions of the theory. This impossibility is sometimes loosely attributed to the inexistence, even prior to hyperinflation, of a market for public bonds, but, with the exception of cases like Bolivia, this does not seem to correspond to historical reality. Alternatively, it may be argued that hyperinflation itself destroys whatever market for public bonds existed before it, leaving to the Government no other option but to finance its fiscal deficit solely through monetary expansion.

This is the case whenever the interest rate on public bonds is fixed in advance, in nominal terms. Under conditions of high and very uncertain inflation

Figure 2
Brazil: Monthly Rate of Inflation



Source: IBGE

rates, this fact makes public bonds an inappropriate hedging, insrument against inflation; capital-owners therefore seek refuge in goods and foreign currency, which are perceived as better (prospective) stores of value. The result, of course, is to intensify the general price rise.

In this way, not only currency, but public bonds, too, depreciate. In other words, not only does the stock of real cash balances shift towards goods and foreign currency, but also the stock of financial wealth previously held in the form of public bonds. This (inflationary) process is aggravated by the fact that private titles also depreciate, and, with them, the financial market, due to a reaction on the supply side: for firms, to borrow at nominal interest rates fixed in advance, bears risk (since effective inflation may turn out to be lower than expected inflation) and, in any case, an individual firm's prices may not keep pace with overall inflation.

In the case of Brazil there has ocurred a relatively faster depreciation of money (as indicated by the violent fall of the ratio M1/GDP or Base/GDP) and the market for private bonds[2], but, as a compensation, the market for public bonds has flourished, the latter having become the main store of value in the economy[3]. Thanks to this, the much-feared inflationary explosion did not happen.

This flourishing of public debt was rooted in two institutional features of the Brazilian financial market. The first was introduced in 1986, and consisted in the rewarding of the financial intermediaries, for their holdings of public bonds, according to the overnight interest rates, pegged to current inflation. Formerly, the interest rate these agents received was dictated by monetary correction, while they had to refinance themselves (by affering these bonds to the public) at the overnight rate. In several instances - but specially in 1986, when monetary correction was set at zero by the Government, in the context of the Cruzado Plan - this system imposed severe losses to the financial sector. Since 1986, however, and thanks to this financial instrument, their risk became nil, a fact which obiously greatly increased the Government's ability to issue new bonds.

The second institutional innovation[4] consisted of the "automatic zeroing" (zeragem automática), through which the financial agents that were caught short

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[2] According to Von Doellinger (1991), in the case of Brazil, the private sector's outstanding debt to the financial sector fell 40% between 1987 (when is was 6% greater than the corresponding one for the public sector) and 1989 (when it became only 61% of the latter).

[3] The more rapid depreciation of money in the case of Brazil was a byproduct of this "flourishing" of the market for public bonds. On this, see Pastore (1991).

of liquidity could sell back public bonds to the Central Bank (otherwise, they could buy bonds from the latter). As a result, the financial sector was able to offer public (as well as private) bonds with full liquidity to investors, without having to maintain reserves for this purpose.

Having become endowed, in this way, with protection against inflation and maximum liquidity, the public bonds performed, in Brazil, as an instrument to store of value which some goods and foreign currency performed in the countries where hyperinflation more fully and more rapidly developed.

5 - Indexed Money, Commodity Stockholding and Agricultural Prices

This cushioning of the inflationary pressures was contradictory since it implied the impossibility of an active monetary policy, (Pastore, 1991) and potentially instability due to its dependence on the credibility of the Government that is the willingness of the public to believe that the Government would honor its debt. In addition, it had a harmful consequence for the agricultural sector.

In effect, relative agricultural prices became inversely related to the inflation rate, as Figure 1 showed. In periods of accelerating inflation, as in the beginning of 1987 and in the second semester of 1989, wealth-owners preference for indexed money has also meant a complete lack of interest in the holding of stocks of agricultural commodities, with adverse consequences for agricultural prices. Given the fact that in these periods industrial prices were set ahead of current inflation, partly as a reflection of accelerating expectations and partly as a defense against the prospect of a new price freeze, it is easy to understand the violent fall in the terms of trade of Agriculture, in these periods.

An opposite movement, on the part of the wealth-owners, towards commodity stockholding as well as other non-financial assets, (Rezende, 1992), took place during the price freezes under the Cruzado, Bresser, Verão and Collor I and II plans, when inflation felt abruptly.

One hypothesis, advanced (Rezende, 1992), is that the price control undermined the financial assets' ability to serve as good hedges against inflation, while the liberation of prices reconstituted this ability. The argument is that, during the price freezes, the price indices - and, together with them, financial market indexation - bacame biased downwards, both with respect to the "ture" current inflation (since actual market prices were not reported), as well as (and

[4] For a detailed account of it, see Brandão (1991).

more importantly) with respect to the future, i.e., post-freeze inflation. In contrast, as prices were freed, the price indices - and, together with them, financial market indexation - regained credibility as indicators of effective inflation.

In other words, the argument is that the price freezes were accompanied by expectations of negative real interest rates, even when, as during the Bresser and Verão plans, overnight rates were set at levels supposedly high in real terms (the overnight rates were considered high by comparison with a downward-biased official price index).

This hypothesis, besides assuming, without much possibility of an empirical test, that the expected real interest rates were actually negative, exaggerates perhaps the effect one might expect from this on the demand for financial assets, under conditions of low inflation. After all, the very fall of inflation reduces the premium attached to financial assets due to their inflation-indexing: it is sufficient to note that an error of 100% in the monthly forecast of inflation means a loss in the real rate of interest of -1.92%, if effective inflation turns out to be 4% and not (the forecasted) 2%; but it means a loss of -8.3%, if the market projects 10% and the inflation rate turns out to be 20%. In addition to that, lesser economic uncertainty, brought about by a fall in inflation, reduces the liquidity preference in the economy, which, in itself, puts a premium on the holding of financial assets vis-à-vis physical assets (which are less liquid).

In sum: according to the new hypothesis being proposed in this paper, the reallocation of wealth towards stocks of agricultural goods, that took place during the price freezes, was brought about by the abrupt fall of inflation, and not by the (supposed) financial assets' lower degree of indexation to inflation. Conversely, it was not a (supposedly) higher degree of indexation, after prices were freed , that made the financial assets more attractive, but the fact that inflation rose and became more uncertain. This new hypothesis focuses therefore on inflation itself, and not on the varying degree to which the public bonds were indexed to it during and after the price freezes. Of course, the demand for financial assets during the price freezes fell, additionaly, because the fall of inflation lowered the opportunity cost of holding cash balances. It is clear, however, that this phenomenon of remonetization did have to affect the demand for agricultural stocks, whenever money supply expanded to accomodate the greater demand, leaving therefore constant the real interest rate.

The hypothesis presented so far may be summarized in the following way. In the presence of inflation-indexed, very liquid financial assets in the economy, increases (decreases) as the rate of inflation become associated with negative

(positive) shifts in the demand for non-financial assets, including, in particular, commodity stocks. These changes in the demand for commodity stocks, then, cause corresponding changes in current market supply and, for a given downward sloping demand curve (the case in the home goods sector), in real agricultural prices. This may be seen easily if we adopt the following definition of supply, more appropriate for short-run analysis:

$$S_t = I_{t-1} + Q_t - I_t \quad (1)$$

Where It-1 and It are the levels of inventories in the beginning and at the end of each period (the month, for instance), and Qt is the period's production. Decisions on It are systematically (and negatively) affected by changes in the inflation rate, and hence the supply flow in "t" (St) also changes with inflation, since It-1 is given in t and, by assumption, Qt is unresponsive to contemporaneous price variation. One test for this hypothesis could be, therefore, to estimate the demand for stockholding of every commodity and verify the role of inflation in it. Due to the lack of the appropriate (monthly) data on commodity stocks, however, this test is not feasible for most commodities.

6 - The Role of Farmers' Financial Conditions

This strong negative correlation between inflation and the terms of trade Agriculture/Industry cannot be entirely explained, however, if account is not taken of the farm sector's financial conditions in the different phases we are analysing, in view of their implications for agricultural marketing.

In this respect, it deserves to be noted that farmers' ability and willingness to borrow (and therefore to hold commodity stocks) increased dramatically in 1986, exactly when stockholding demand was heated up in the rest of the economy. This was due not only to the overall expansive credit policy (which included, in particular, the extinction of monetary correction on rural loans), but also because, the prices of land soared in 1986, as a result of the Cruzado Plan (and as it happened with urban real estate, stocks, foreign currency and other "real"assets). Following the increase in their assets, farmers became more willing to take risks (through greater indebtedness), as well as becoming more attractive clients for the banks.

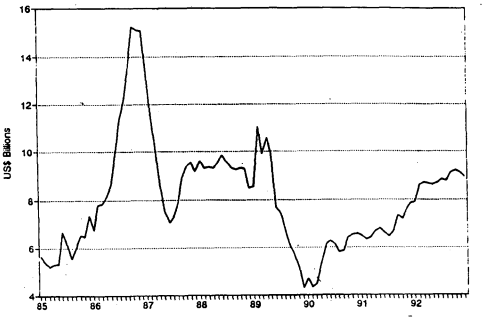
It is equally notable the economic situation, in the first semester of 1987, with increased inflation (with its negative impact on the holding of commodity stocks by the non-agricultural sector) and a high degree of farmers' indebtedness,

brought about by the Cruzado Plan. The ensuing financial crisis clearly forced the farmers to sell (or "liquidade") their crops (in some cases their lands) at whatever prices they could get in the market. Were it not for the firm stand adopted by the Government by absorbing the undesired stocks and promoting (at the expense of the Treasury) farmers' financial adjustments, one would have observed, already in the agricultural year 1987/88, the same planned reduction in productive activity levels that occurred in the agricultural years 1989/90 and 1990/91.

It may be safely assumed that a reduction in the desired degree of indebtedness took place in the farm sector since these 1987 events. As pointed out before, financial obligations at floating interest rates (as it is the case with rural credit borrowing at fixed real interest rate plus monetary correction) tend to be avoided by firms when inflation is very high and uncertain, due to the ensuing uncertainty of individual product price behavior vis-à-vis overall inflation and the consequent higher risk of default. This certainly accounts, at least in part, for the drastic reduction in farm indebtedness that occurred in this period (see Figure3).

With respect to this problem of risk, the specific situation of agriculture became truly dramatic, because economic policy tools most relevant for agricultural price formation became more subordinated to short-run stabilization goals (in the context of the heterodox stabilization plans), and therefore stopped providing to agriculture the suport which they had provided until 1986, and which had become even more necessary as inflation rose. Thus minimum prices fell consistently in the period (see Table 5), as a result of the general prices freezes in January 1989, March 1990 and February 1991; as a consequence, the minimum prices policy lost completely its relevance (cf. Table 6).

Figura 3
Total Rural Credit Balances



Source: Central Bank.

The higher degree of self-financing meant greater freedom of choice of the farmer for the timing of the marketing of the crop. In a context of greater instability of prices, this should contribute to reduce the sectoral risk. The problem, however, is that the farmers became freer also to follow market signals that later proved to be treacherous and led them to the rocks and to not to the harbour.

These treacherous indicators came from the macroeconomic environment. The harvesting of the 1989 crops was accompanied by rising agricultural prices (see Figure 1), due to the Verão Plan and to the farmers' greater financial capacity to withhold their crops, thanks to the combination of lower level of indebtedness incurred in 1988 and a new land price rise. The farmers expected to repeat the experience of 1988, when they could retain this crops (facilitated by greater supply of marketing credit) in the first semester and sell them in the second semester at higher prices. However, the 1988 U.S. drought was replaced, in 1989, by reaccelerating inflation after June and the consequent return of financial assets' attractiveness. The result was the collapse of agricultural prices, to wich the farmers themselves contributed, since, in their attempt to find a better refuge for the capital they had invested in production and that they had been keeping in the form of commodity stocks, they also rushed to the overnight

Table 5
BRAZIL: INDICES OF REAL MINIMUM PRICES FOR MAJOR CROPS, 1981-92
(1981 PRICES = 100)

Years	Seed Cotton	Rain-fed Rice	Edible Beans	Corn	Soybeans
1981	100	100	100	100	100
1982	105	102	106	112	105
1983	96	91	97	98	94
1984	103	95	92	92	81
1985	126	125	113	140	151
1986	106	108	95	123	133
1987	72	76	73	86	88
1988	73	72	73	96	80
1989	60	55	69	84	66
1990	40	38	51	57	42
1991	47	43	60	59	48
1992	50	51	56	79	61

Source: IBGE
Note: Minimum prices were first deflated (using IGP-DI), then averaged for the harvest montis. Sources of basic data: CONAB and FGV.

Table 6
BRAZIL - STOCKS OF COMMODITIES ACQUIRED THROUGH AGF PROGRAMME, OR FINANCED THROUGH EGF PROGRAMME, BY FEDERAL GOVERNMENT, 1985-92
(percentages of yearly harvests)

Years	Seed Cotton		Rice		Edible Benas		Corn		Soybeans	
	AGF	EGF	AGF	EGF	AGF	EGF	AGF	EGF	AGF	EGF
1985	22.6	16.0	18.2	20.6	23.7	5.3	13.6	7.6	12.1	17.9
1986	4.5	52.4	17.1	34.4	3.6	6.3	20.8	8.3	8.4	22.5
1987	2.3	85.1	27.2	30.1	2.5	5.5	24.4	6.9	5.0	25.4
1988	1.8	59.7	18.6	30.4	4.8	4.4	6.6	15.6	0	11.7
1989	0.3	24.6	8.1	17.3	0	2.1	4.1	13.9	0	4.3
1990	0	7.1	1.2	4.2	0.3	3.0	2.1	2.1	0	2.1
1991	0	7.7	0.0	3.5	0.6	3.7	0	3.7	0	1.2
1992	0.6	6.2	0.8	35.8	6.7	15.7	1.2	17.0	0	4.1

Source: IBGE and CONAB

market, "liquidating" their stocks. To some extent, this sale of commodity stocks was also imposed on the farmers, that became short of liquidity in view of the delay in the liberation of rural credit (custeio) for the 1989/90 planting. Falling agricultural prices (as well as land prices) in late 1989 led to pessimistic expectations regarding the future, compressed farmers' self-finance capacity and, as a result, caused the decline of investment levels in agriculture in the 1989/90 crop year.

It is interesting to note that farmers were at least fortunate in that the collapse of the Verão Plan (and the accompanying collapse of agricultural prices) came before planting (and the borrowing of credit). By contrast, the conjuncture of 1986/87 was much more detrimental to farm financial conditions, since the collapse of the Cruzado Plan (and agriculture prices) came after planting and borrowing had taken place.

Farmers were not equally fortunate, however, with the climatic conditions that prevailed in the crop year 1989/90, which were responsible for serious crop failures in the Westcentral region, Southeast and Northeast. Crop failures also hit the Southern region, in the succeeding crop year (1990/91), so that all regions faced climatic adversities in one of the two crop years 1989/90 and 1990/91 (see Table 3). The consequence was that the farm sector as a whole ended up the period with a high degree of involuntary indebtedness, and - what was worse - outside the official rural credit system. Such a financial situation became a true bottleneck for the recovery of agricultural investments and output. The shortage of agricultural supply in 1991, and the fears that a worsened situation in this respect in 1992 would threaten macroeconomic stabilization, led the Government, in late 1991, to provide an abundant supply of rural credit, at concessionary interest rates. Together with this, the minimum prices policy was reinforced. The experience with market liberalization, blindly followed by economic policy in 1990 and 1991, was over[5].

7 - The Role of Exchange Rate Policy

It should be acknowledged that the foregoing analysis may not account entirely for the post-1989 agricultural downturn, since the behavior of domestic prices of export-market agriculture - conditioned as they are by exchange rate

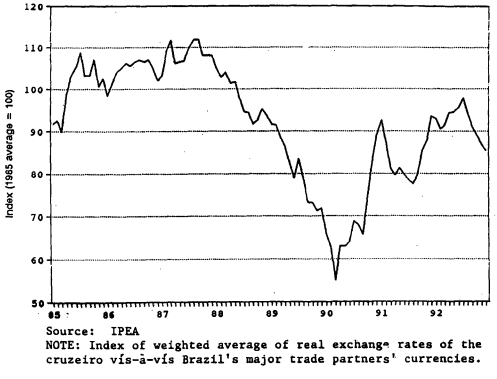
5. Coincidence or not (the climate clearly helped), another bumper crop was harvested in 1992 (see Table 1), creating the conditions for a new period of sustained agricultural growth with expected new record crop in 1993-4.

and intenational commodity prices - was not covered by this analysis. The role of exchange rate policy, in particular, that was considered so important in promoting the previous growth of agricultural output (Goldin and Rezende, 1990), deserves closed attention.

As a matter of fact, substantial exchange rate appreciation in 1989 further aggravated the problem agriculture was facing in this period. As Figure 4 shows, the index of the effective exchange rate, that had already fallen from 105 to 93.5 between January and December of 1988, reached the value of 54.9 in March 1990, accumulating therefore a fall of nothing less than 41% in 15 months.

It remais beyond the scope of this paper to ascertain the relative importance of the two factors - namely, increased agricultural price instability brought about by unstable commodity-stockholding or reduced profitability due

Figure 4
INDEX OF REAL EFFECTIVE EXCHANGE RATE



Source: IPEA

NOTE: Index of weighted average of real exchange rates of the cruzeiro vís-à-vís Brazil's major trade partners' currencies.

to overvalued exchange rate - in the undermining of agricultural growth since 1989. In any case, since the course of the exchange rate in this period was also dictated by the needs of short-run control of inflation, it is ultimately the inflation problem that, by becoming an overriding concern, disrupted the pre-1986 set of policies (macroeconomic as well as sectoral) that, as argued in Goldin and Rezende (1990), promoted the 1980's agricultural growth.

8 - Conclusions and Policy Recommendations

This paper argued that the institutional arrangement responsible for the

"indexed money" since 1986 made it possible for the Government to maintain (and even increase) its fiscal disequilibrium - that would necessarily have been checked by hyperinflation. The same policy raised the instability of agricultural income, to the point of creating the conditions that led to the downward-adjustment in investment levels for the agricultural year 1989/90, a fact which compounded adverse climatic conditions and caused poor harvest in 1990.

The paper also pointed out that this instability was aggravated by the operation of the instruments of agricultural policy (minimum prices and rural credit), which became subordinated to the objectives of short-run macroeconomic stabilization. This myopic behavior of economic policy reached its climax in 1990, when principles of market liberalization, seemingly valid in general but utterly inappropriate in the specific situation of an acute agricultural crisis, dictated the orientation of economic policy towards the agricultural sector. Compounding and aggravating the problem, the pursuing of a restrictive monetary policy in 1990, without any concern for the specific conditions of the farm sector (specially due to the fact that it had already been hit by crop failure), made it impossible for agriculture to respond to higher prices and recover its normal activity levels. Combined with poor weather in the 1990/91 crop year, the result was the acute shortage of agricultural output and the running-out of official reserves which characterised the situation of the Brazilian economy in 1991, with its well known adverse implications for balance of payments, inflation and the income of the poor.

It was also pointed out in the paper that the sharp appreciation of the exchange-rate, which occured in 1989 - another by-product of the overriding concern with inflation -, imposed an adverse price behavior on the export, as well as on the import-competing, agricultural subsectors, behavior. An interesting but difficult question which remains open for future research is the relative importance of exchange-rate appreciation and domestic market agriculture's price instability in the undermining of agricultural incentives in 1989.

The main lesson to be learned from this recent period can now be simply stated. Since stabilization policies, by destabilizing agricultural marketing, may have a particularly adverse impact on agricultural investment and output, and in view of the strategic importance that a good agricultural performance has for macroeconomic stabilization in Brazil, the implication is that stabilization policy always should include measures specifically designed to neutralise this anti-agriculture bias.

In this direction, the major recommendation is that the Government should clearly commit itself to support the marketing of agricultural commodities and

provide, in this way, effective minimum prices. It is necessary not to forget that, after all, it was thanks to this policy (as well as to the realignment of the exchange rate) that, as shown in the Goldin and Rezende (1990), agriculture was able to give a relevant contribution to the external adjustment the Brazilian economy had to undergo in the eighties. In that period, it may be recalled, fiscal austerity and contractionary monetary policy were also adopted - for the sake of which, by the way, rural credit subsidy was virtually terminated -, but economic policy had the farsightedness of making room for a well-defined minimum prices' policy.

To conclude, the main lesson to be learned from this analysis of the recent downturn of agricultural growth in Brazil is that an unstable inflationary context makes agricultural price stabilization even more necessary. In the absence of this policy, agricultural investment may be expected to fall sooner or later, particularly that portion financed by credit. This is because borrowing for short-run operating expenses (custeio), without assurance of future availability of marketing credit (or, more generally, of agricultural price support), means that the farmers will have to sell their crops as the loans are due (in the harvest time), irrespective of the market conditions. Once they learn about this risk, farmers reduce their borrowing so as to acquire more control over the marketing of their crops. But, as shown in this paper, once commodity stocks become concentrated in farmers' hands, agricultural prices become more volatile, due to their greater sensitivity to macroeconomic instability and to the farmers' liquidity situation. Higher price instability, in its turn, ends up by deppressing self-financed investment, and an agricultural crisis errupts. A credible minimum prices policy is an effective counter measure not only because it stimulates farmers' investing their own as well as borrowed funds in production, but also because allows farmers to stockhold less of their crops. In the process, they become less preoccupied by the marketing of their crops. Farmers' income and agricultural investment can thus be dissociated from the vagaries of agricultural price variation, which, in the end, may turn out to be smaller, not only downwards, but upwards as well.

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