

B A N K   O F   G U Y A N A

PUBLIC SEMINAR TO COMMEMORATE  
THE 10TH ANNIVERSARY OF  
ITS ESTABLISHMENT

"THE ROLE OF INDEXING IN BRAZIL'S  
ECONOMIC POLICIES"

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Thursday 16, October, 1975

8.00 p.m.

At the  
City Hall.

RPM 5 1975

## THE ROLE OF INDEXING IN BRAZIL'S ECONOMIC POLICIES

During the past seven years, the annual rate of inflation in Brazil has averaged over 20 percent, but this has not impeded economic growth in real terms of about 10 percent a year. This success in "living with inflation" frequently has been attributed--in part, at least--to a system of indexing or "monetary correction" which provided for wages, financial instruments, taxes, the exchange rate, and other economic variables to increase paripassu with the general level of prices, thereby minimizing the distortions usually associated with inflation. Unfortunately, good descriptions of Brazil's system of indexing are available only in Portuguese, and most of the recent characterizations of the system in foreign publications have oversimplified its operation and often have been misleading.<sup>1/</sup>

The following description of the Brazilian system emphasizes that indexing is not as extensive as is sometimes suggested and that almost nothing is indexed through a simple 100 percent link to prices. In the case of wages, for example, prices are only one element in the wage formula, and the formula itself has undergone revision during the past decade to keep it in line with the Government's general wage policy, resulting in wage adjustments quite different from those which would have been produced by the use of a simple escalator clause. In the case of financial instruments, only about one fifth of the obligations of the Brazilian Treasury and

<sup>1/</sup> For the best description of the philosophy and practice of indexing in Brazil, see Julian Chacel, Mario Henrique Simonsen, and Arnaldo Wald, *Correcao Monetaria* (Rio de Janeiro, Brazil, APEC 1970); and a good summary of the Brazilian system by Alexandre Kafka in American Enterprise Institute for Public Policy Research, *Essays on Indexation and Inflation, Domestic Affairs Study 24* (Washington, D.C., October 1974).

Productive investment fell, as the medium-term capital market was almost nonexistent and the generation of internal investment funds was hindered by corporate income taxes ill-adapted to high inflation. Finally, Brazil's public finances were seriously weakened, because all charges for public sector services and some of the minor taxes were specific rather than ad valorem; in addition, taxpayers delayed payments to take advantage of the loss in purchasing power of the cruzeiro.

Faced with this combination of high inflation and serious distortions in relative prices, the new Brazilian Government which took power in April 1964 adopted a medium-term plan to: (1) eliminate inflation gradually over a period of four or five years; and (2) minimize inflationary distortions during the transition period. While the reduction of inflation has been slower than expected, the program to minimize the distortions from inflation, through indexing and discretionary action, has been generally successful: real interest rates have been positive; the exchange rate has been adjusted regularly to compensate for increases in domestic costs relative to those abroad; and rents, tax revenue, charges for public services, and other key economic variables all have roughly kept pace with inflation. Saving and investment in the economy have been high, the balance of payments has been strong and output has risen at an unprecedented rate.

## II. The System of Indexing

### 1. Monetary correction of financial instruments

#### a. Readjustable Treasury Bonds

In 1964 the Brazilian Government issued a series of Readjustable Treasury Bonds which were indexed for inflation in addition to paying a

small nominal interest rate; these Treasury Bonds have set the pattern for most other forms of "monetary correction" of financial assets--although, as mentioned above, the indexing of financial assets has not spread very widely in the private sector. The law does not prescribe what price index will serve for adjusting Treasury Bonds, but in practice the wholesale price index has been used. The initial reception to the Treasury Bonds was not very enthusiastic, as most Brazilian savers preferred to continue converting their idle funds into foreign exchange. To meet this problem, the Government offered a new series of Bonds in May 1965 which gave purchasers an option of monetary correction based either on the wholesale price index or on the exchange rate with respect to the U.S. dollar, whichever was more favourable. This option could be chosen ex post, but since 1968 the rate of depreciation of the cruzeiro in relation to the U.S. dollar has been consistently less than the rate of increase in wholesale prices, and monetary correction based on wholesale prices always has been the more favorable option.

The exact procedure used to adjust Treasury Bonds is worth describing because it reveals some of the issues involved in a system of indexing. Simply stated, a one-year Bond bought in February 1971 and redeemed in February 1972 received a small nominal interest rate plus an adjustment for the intervening increase in wholesale prices. The link to prices, however, involved an average lag of five months because of delays in the availability of statistics. The index number used to adjust a Bond in February 1972, for example, would in practice be calculated and announced in December 1971, at which time the latest available price data were for October. Moreover, in order to reduce monthly fluctuations in the

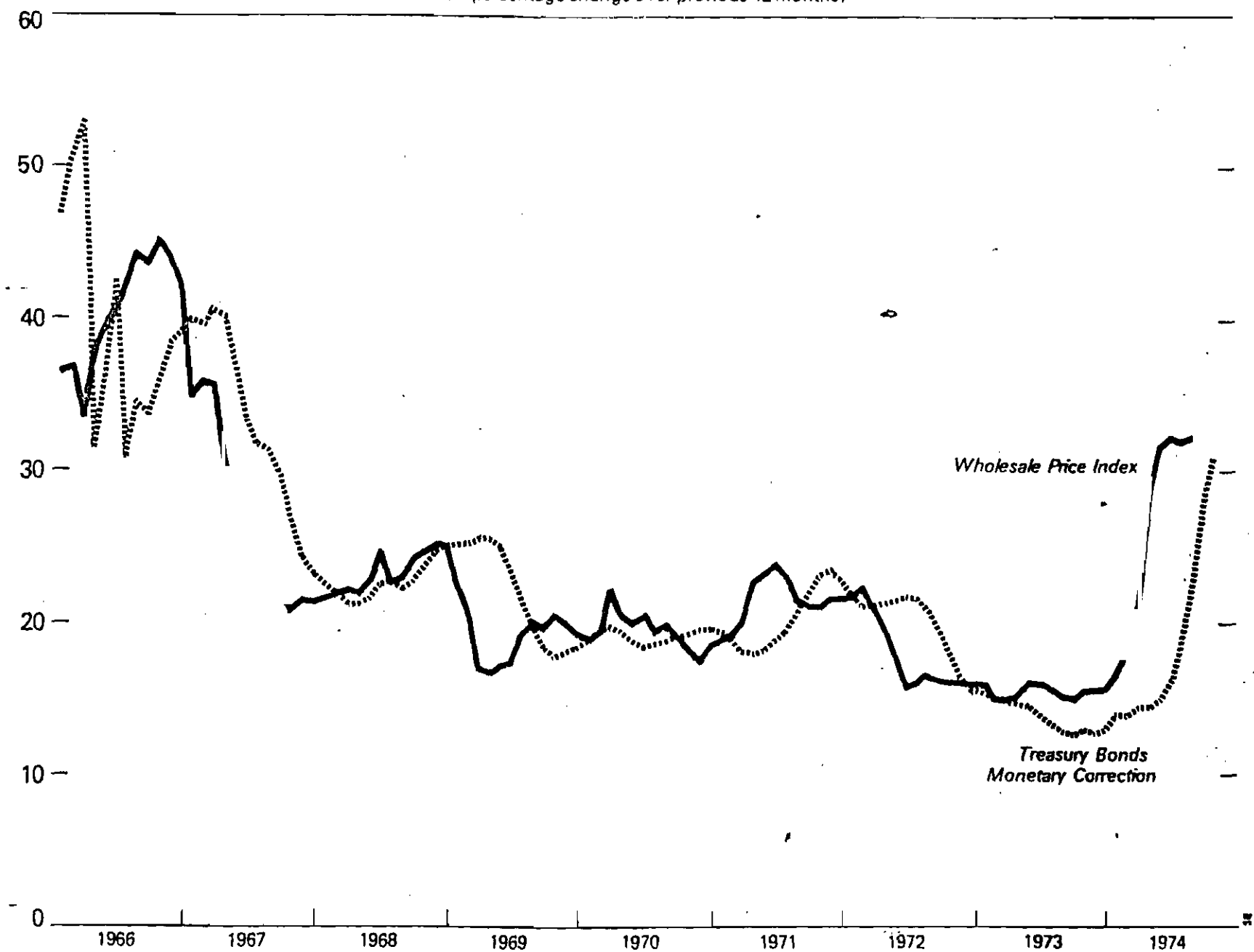
value of the Bonds, the Government used three-month averages of prices. Consequently, a one-year Bond redeemed in February 1972 was adjusted for the increase in wholesale prices between the periods August-September-October 1970 and August-September-October 1971. This lag can be seen in Chart 1, for example, which shows a downturn in wholesale prices in late 1966, followed about five months later by a corresponding decline in the rate of adjustment of Treasury Bonds.

The above method of calculating monetary correction on Readjustable Treasury Bonds was abandoned in the period December 1972 - March 1974, and a new system was adopted which represented a departure from pure indexing. The change was made in 1972 because the system of lagged-indexing was complicating the Government's efforts to reduce inflation; as can be seen in Chart 1, inflation declined to an annual rate of about 15 per cent in mid-1972, but the adjustment on the Bonds remained around 20 per cent for several months because of the link to price developments five months earlier. In December 1972 the Government decided to eliminate this lag by using "projected" inflation for the recent months where price statistics were lacking. Under the new system a Bond redeemed in February 1974, for example, used actual price increases to November 1973 and "projected" increases for the remaining three months up to January. As explained below in the discussion on wages, the Government's projected inflation generally has been less than actual inflation, and the monetary correction of Treasury Bonds became much smaller under the revised method of calculation. For this reason the adjustment of the Treasury Bonds was less than actual inflation during most of

1973 - as can be seen in Chart 1. In the 12 months ended in December 1973, the correction on Treasury Bonds was only 12.8 per cent compared with 21.5 per cent in the 12 months ended in July 1972 - even though the actual increase in wholesale prices was about 16 per cent in each of the two periods.

In the late 1960s and early 1970s, sales of these indexed Treasury Bonds to the Brazilian private sector were relatively small, and their role in Brazil's capital market remains quite limited. This is because, despite the indexing feature, the total return on the Bonds has generally been below other interest rates in Brazil, as explained more fully in Section c. below. A total of Cr\$21 billion of the Bonds was outstanding at the end of 1973, but of this amount only about Cr\$3 billion (equivalent to less than 1 per cent of GDP) was held by the general public. About Cr\$10 billion, or almost one half of the Treasury Bonds outstanding, was held by commercial banks to fulfill reserve requirements. This is part of a government program to aid the banking-system - which became overextended during the period of inflation and is gradually being reformed and consolidated under the supervision of the Central Bank - by permitting banks to earn interest on a portion of their required reserves. Another Cr\$5 billion of the Bonds was held by the National Housing Bank, which is the one major segment of the financial system accepting deposits with monetary correction and therefore also requiring assets in this form; and about Cr\$3 billion was in the portfolios of a wide variety of public sector entities and insurance companies.

BRAZIL  
WHOLESALE PRICES AND  
MONETARY CORRECTION OF TREASURY BONDS  
(In percentage change over previous 12 months)



Sources: Central Bank of Brazil; and Fund staff estimates.

During the past two years, the Treasury has moved somewhat away from indexing, by issuing nonindexed Treasury Bills instead of indexed Bonds. These Bills were first introduced in 1970, and large quantities were sold to the public in 1972 and 1973 to absorb the excess liquidity produced by inflows of capital from the Euro-currency market. The Bills have an average maturity of less than six months and are not indexed on the grounds that the linking of such a short-term asset to a price index would not be feasible. The Bills are simply sold at weekly auctions at discounts, following the procedure used in many other countries. The yield on the Bills is, however, almost as high as the total return (including monetary correction) on Readjustable Bonds, and they have the advantage of greater liquidity. By the end of 1973, the total Bills in circulation were almost as large as the indexed Bonds, and unlike the Bonds they were mainly in the hands of voluntary purchasers.

b. Housing Finance

Apart from Treasury Bonds the only other major financial instruments which have been subject to indexing in Brazil are those pertaining to housing finance. Since 1964 both assets and liabilities in the housing sector have been linked to either a price or wage index and adjusted monthly, quarterly, or annually, in accordance with movements in the index. There have been frequent changes in the system of indexing, however, and, as in the case of Treasury Bonds, the Government has enjoyed



wide freedom to change the index in order to meet the needs of its housing policy or its overall economic policy.

Until 1969 the principal index applied in housing was the one calculated for Readjustable Treasury Bonds, described above. The balance due on all mortgages was adjusted upward periodically in accordance with this index. Under some of the mortgage plans, the monthly payments of interest and amortization also were increased in line with this index, but under other schemes the monthly payments were adjusted in accordance with the minimum wage - with a corresponding change in the maturity to compensate for the differing adjustments of monthly payments and principal. Beginning in 1969, however, a new system was introduced under which the principal, interest, and amortization all were adjusted upward once a year in accordance with changes in the minimum wage. In 1973 the system again was modified, when the Housing System reverted to using for all purposes the index calculated for Treasury Bonds.

Unlike the principal and monthly payments on mortgages, the savings instruments which are used to finance housing have been adjusted in accordance with the Treasury Bonds index throughout the past decade. These instruments include savings deposits (some of which are made by potential mortgage customers), mortgage bonds sold to the general public, and obligations of the national Unemployment Insurance Fund. This Unemployment Fund was established in 1966, with all employers paying an amount equivalent to 8 per cent of their wage bill; workers' equity in the Fund is

indexed in accordance with the Readjustable Treasury Bonds, and the assets of the Fund are placed mainly at the disposal of the National Housing System. The Housing Bank, operating with liabilities which are all indexed, prefers to have its assets indexed in the same way; its excess funds, therefore, are invested in Readjustable Treasury Bonds, as mentioned in the preceding section.

As a result of the system of indexing, the Brazilian mortgage market, which was almost nonexistent in 1963, has grown substantially in the past decade. The program of indexed mortgages has had a series of problems, however, including at various times a high level of defaults. The most frequent explanation for these defaults was that the family incomes of some mortgages did not grow pari passu with the mortgage obligations. This explanation undoubtedly was incomplete, but the problem became so severe that a revision in the system was made in 1972 to provide for mortgage payments which will decline in real terms over time. This was not done by abandoning indexing. All obligations continue to be indexed, but the initial service schedule on mortgages, which previously involved equal total payments (amortization plus interest) over the life of the contract, has been switched to one of equal amortization payments. All payments remain indexed, as before, but since the real interest payments become gradually smaller as the loan is paid off, the total monthly payments decline in real terms despite the indexing.

## c. Other Financial Assets

Contrary to popular belief, indexing of private sector financial instruments other than those related to housing finance remains rather limited in Brazil. At the end of 1973, of the total financial instruments of Cr\$218 billion issued by the Brazilian Treasury and the Brazilian financial system, about Cr\$42 billion, or 19 per cent, was indexed (Table 1). The Brazilian Treasury was the debtor on Cr\$21 billion, or half, of the indexed paper. On several occasions during the past decade, the Government has tried to encourage the spread of indexing into the private sector, but the movement appears to have been resisted by borrowers. Financial institutions are not prepared to accept indexed deposits unless they can find borrowers willing to assume an obligation with indexing. Private firms, however, have been reluctant to assume such "open ended" obligations, where the nominal interest rate might turn out to exceed greatly their projections. They appear to prefer the certainty of rates fixed in nominal terms, even if these rates are high, rather than rates fixed in real terms. Interestingly, at one point in 1966 the Government's reason for wanting to extend indexing to the private sector was because it believed that this would lead to a reduction in interest rates. At that time inflation had declined, but inflationary expectations remained strong and nominal interest rates remained high. The Government, convinced of the effectiveness of its own anti-inflationary program, believed that interest rates of 5-10 per cent plus monetary correction would produce lower rates than those prevailing in the

market. Thus, between March and May 1966 the Government even issued a special series of one-year Readjustable Treasury Bonds with the proceeds designed for re-lending to the private sector. The Treasury agreed to pay 6 per cent interest plus monetary correction on the Bonds and re-lent the funds to the private sector at a flat 24 per cent. Because of a large devaluation - the Bonds had an exchange rate option - the Treasury ended up paying a total of 55 per cent for the funds, and this attempt to extend indexing to the private sector was discontinued after heavy losses to the Treasury.

Table 1. Brazil: Principal Financial Instruments  
Issued by the Treasury and the Financial System

(In Billions of Cruzeiros)

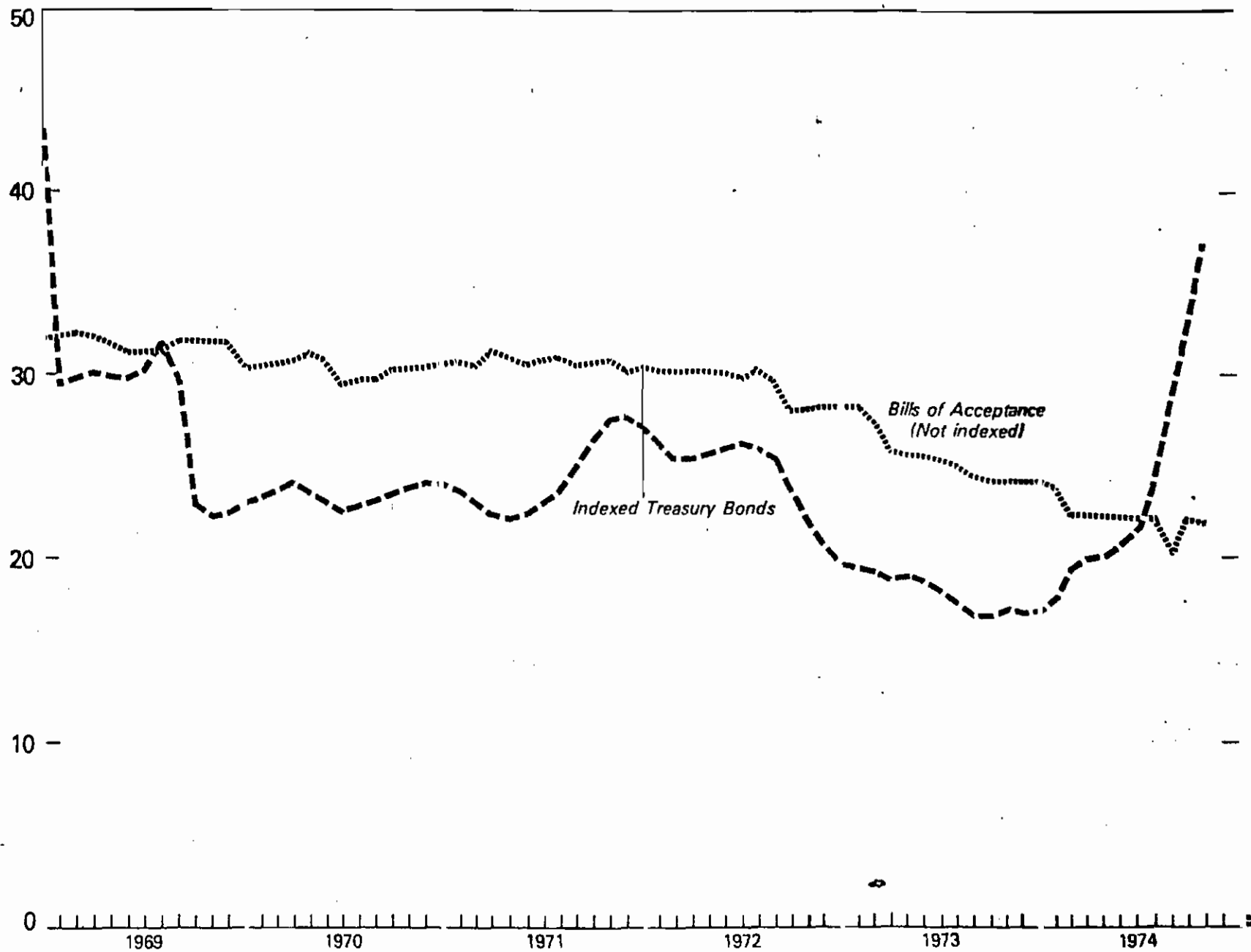
	December 1973
Total	<u>218</u>
<u>Nonindexed</u>	<u>176</u>
Currency in circulation	17
Sight deposits	77
Time Deposits	28
Bills of exchange	37
Treasury bills	17
<u>Indexed</u>	<u>42</u>
Treasury Bonds	21
Mortgage Bonds	7
Savings Deposits	14

Source: Central Bank of Brazil

The erroneous impression that indexing is very extensive in Brazil's private sector is partly due to the ex ante monetary correction advertised by Brazilian commercial banks on their time deposits. This ex ante correction for inflation merely means that a certain projected level of inflation presumably has been allowed for in setting the total interest rate. The practice of ex ante monetary correction originated partly to circumvent Brazil's usury law, which limited interest to 12 per cent; the borrower would agree to pay, for example, 10 per cent interest and a further 12 per cent allowance for inflation. At certain times the portion corresponding to inflation also received a different tax treatment from the remainder of the interest - on the grounds that "interest" which merely permitted the saver to keep pace with inflation should not be considered taxable income. But the total return paid on instruments with ex ante monetary correction is agreed in advance, and the instrument is not indexed in the sense that the return varies with the actual behavior of prices.

The absence of generalized indexing of private sector financial assets does not mean that interest rates in this sector are low. Throughout the period 1969-1973, interest rates payable to savers on bills of acceptance - the most popular nonindexed instrument - have at all times exceeded the total return (monetary correction plus interest) payable on Treasury Bonds (Chart 2). Because the interest rates on nonindexed bills of exchange and time deposits were highly positive, the indexed Treasury Bonds held no special attraction for Brazilian savers - until the upsurge of inflation in 1974 and the lag in adjusting the nonindexed rates.

CHART 2  
BRAZIL  
RATE OF RETURN ON SELECTED FINANCIAL INSTRUMENTS  
(in per cent per year)



Source: Central Bank of Brazil.

The recent marked increase in Brazil's inflation - from about 15 per cent in 1973 to over 30 per cent in the 12 months ended in September 1974 - has caused the indexed Treasury Bonds to become more attractive than fixed interest securities for the first time in over five years. During 1973 the interest paid on a nonindexed time deposit in a Brazilian commercial bank was 21 per cent compared with a total return on an indexed Treasury Bond of about 17 per cent (13 per cent monetary correction and 4 per cent interest). By October 1974, however, because of the sharp rise in inflation (and the reversion to a system of pure indexing), the return on Treasury Bonds had risen to over 35 per cent, while the maximum interest rate permitted on time deposits had increased to only 27 per cent. This marked shift in interest rates in favour of Treasury Bonds caused an outflow of funds from financial institutions after mid-1974. The Brazilian authorities first tried to offset the increased attractiveness of Treasury Bonds by fiscal measures reducing the taxation of interest on nonindexed assets. Finally, however, in August 1974 the authorities announced a temporary suspension of the sale of Treasury Bonds.

## 2. The Wage Formula

During 1964 and 1965 the new Brazilian Government abolished strikes and collective bargaining on wages and ordered that future wage adjustments in the industrial sector be made in accordance with an official formula, which is described below. Total employment in the unionized sector, for which the wage formula was designed, was less than 2 million workers out of

a work force of 30 million. This sector included, however, the strongly organized groups, and the purpose of using the standard formula for these groups was to ensure relatively uniform wage adjustments in accordance with the possibilities of the economy rather than adjustments dependent on the relative strength of each union. Other wages in the economy continued to be set by the Government independently of the formula (as in the case of the minimum wage and the wages for national and local government employees), or remained completely free of control (as in the areas of services and agriculture).

The official wage formula used in Brazil since 1965 is not at all comparable to a cost of living escalator clause operating during the life of a wage agreement. The contract is signed for a 12 month period (with contract renewals for various industries spread throughout the year); once the wage is determined there is no link to prices and no adjustment in nominal wages until the contract expires. The rise in the cost of living is taken into consideration only when a new annual contract is signed. Furthermore, even the new contract does not necessarily include full compensation for past inflation. The formula was specifically designed, in fact, to break the previous pattern of fully compensating for past inflation which, together with escalator clauses during the contract period, had been largely responsible for the wage-cost spiral under the previous system of collective bargaining. The formula was based on the recognition that the maintenance of average real wages did not require full compensation



for the past year's inflation - provided inflation was declining. For example, if inflation was 90 per cent during 1964 and was projected at 50 per cent during 1965, a contract signed in January 1965 would only have to allow a wage increase of about 70 per cent to preserve the average real wage during the following year, assuming actual inflation was in line with the projection. Admittedly, the real wage early in 1965 would be lower than in early 1964; but this would be offset toward the end of the year by a real wage which was higher than at the end of 1964.

Specifically, wage increases granted under the 1965 formula reflected three components, which were designed to (1) raise the real wage up to the average of the previous 24 months; (2) provide for the maintenance of this average wage by granting an additional amount equal to one half of the "projected" inflation during the year covered by the wage agreement; and (3) allow a small additional amount for higher productivity. The allowances for future inflation and productivity were announced each year by the Ministry of Planning. Not surprisingly, the estimate of future inflation always was less than the actual inflation turned out to be. For example, in the year beginning August 1966, the projected inflation used in the wage formula was only 10 per cent, whereas the actual increase in the cost of living was 30 per cent. As a result, average real wages declined during 1966 and 1967, despite the professed goal of the formula to maintain them (Table 2). This restraint on wages undoubtedly was a major reason for Brazil's success in reducing inflation rapidly in these years - from 90 percent in 1964 to about 25 per cent in 1967 - while at the same time increasing investment and strengthening the balance of payments.

Table 2. Brazil: Wages and Prices

	Cost of Living Used in Wage Formula <u>1/</u>	Average Increase Granted in Yearly Wage Settlements Made During Month <u>2/</u>	
		Private Sector	Public Sector
	Percentage increase during previous 12 months	<u>In per cent</u>	
December			
1966	41.9	30.0 <sup>3/</sup>	30.0 <sup>3/</sup>
1967	25.5	20.1	20.1
1968	22.8	24.5	25.1
1969	24.5	28.2	26.4
1970	22.1	22.0	22.4
1971	19.8	22.0	22.6
1972	17.9	19.4	20.0
1973	13.9	16.6	16.6
June			
1974	22.6	24.5	24.9

Sources: Getúlio Vargas Foundation; and Ministry of Labor.

1/ Refers to previous month; figures for December represent the increase in prices during the 12 months ended in November, and figure for 1974 is increase during 12 months ended in May 1974.

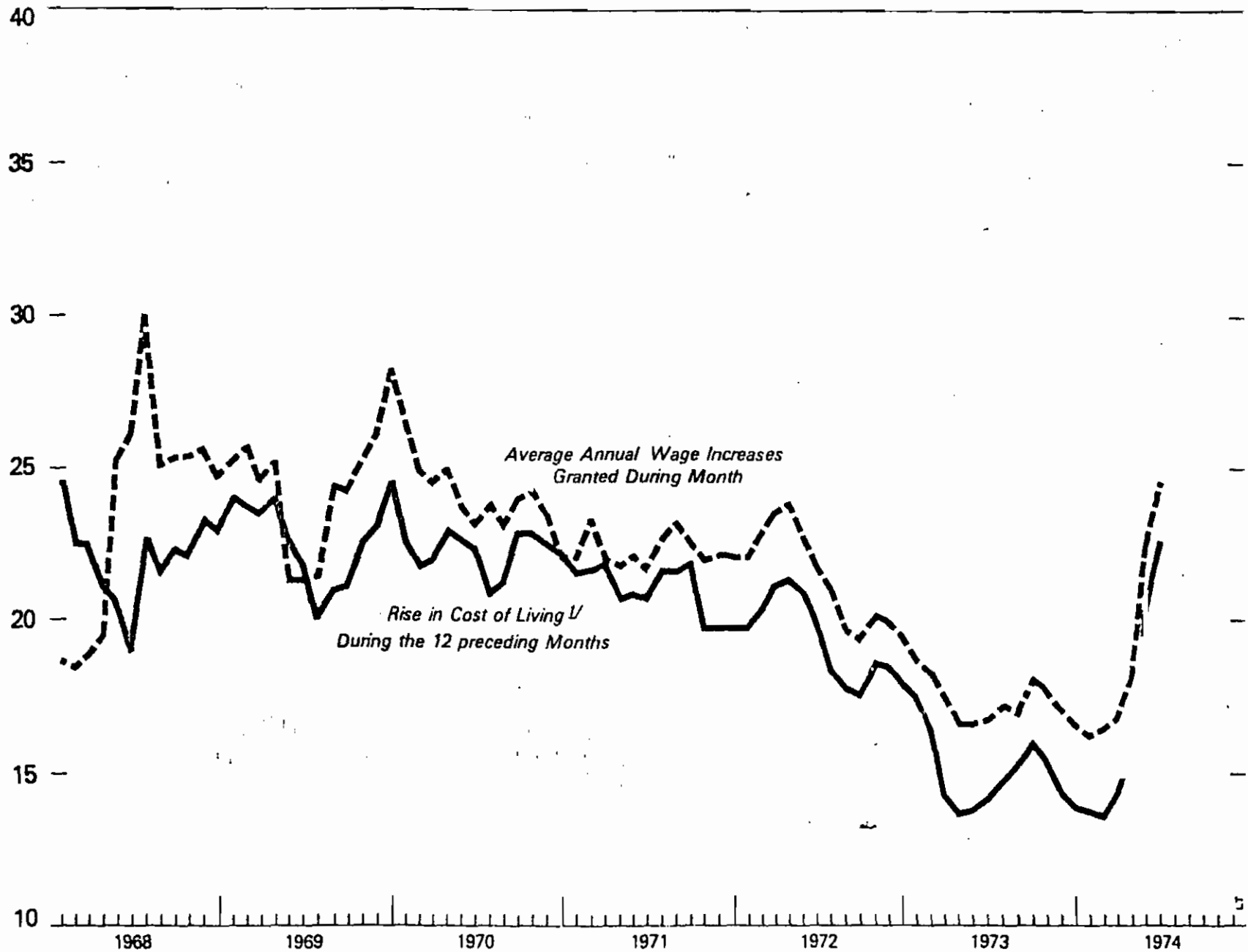
2/ Under the official wage formula.

3/ Staff estimate based on partial data.

Brazil's wage formula was revised in 1968, and since that date real wages granted under the formula have risen gradually (Chart 3). The major change was the introduction of a new component in the wage formula to compensate for the excess of actual inflation over projected inflation during the previous contract period: in calculating the real wage base for the coming year, the revised formula used not the real wage actually received in the past year but the intended (higher) real wage which would have been received if inflation had been as projected. Also, the allowance for the growth in productivity was raised gradually from zero to 3 - 4 per cent in recent years. Because of these 1968 adjustments to the formula, real wages granted under the formula rose by an average of 2-3 per cent a year from 1968 through 1973.

Most other wages in Brazil, which are not governed by the official wage formula, appear to have followed a similar pattern since 1964, declining in real terms until 1968 and increasing since that date. In the six years, 1968 - 1973, when inflation averaged 20 per cent, the minimum wage was raised by an average of 24 per cent in those states with the lowest minimum and 20 per cent in areas with the highest, continuing the Government's policy of gradually reducing the regional differentials in the minimum wage. For government employees, on the other hand, general wage increases consistently have lagged behind the rise in prices, as part of the effort to reduce the number of government employees, which was regarded as excessive in the early 1960s. Exceptions have been made, however, for highly trained public servants, where unusually large fringe

CHART 3  
BRAZIL  
WAGE AND COST OF LIVING INCREASES<sup>1/</sup>  
(In per cent)



<sup>1/</sup> Rio de Janeiro cost of living index until 1970; after 1970, national cost of living prepared by Ministry of Labor.

benefits and rapid promotions have been granted, resulting in wage increases far in excess of the average in order to retain them in the public sector. It should be added that the real wages of highly skilled employees in the private sector, most of whom are not covered by the wage formula, also appear to have risen in recent years much faster than wages under the formula.

The question frequently has been posed, particularly by those who regarded the wage formula as an escalator clause for wages, whether the existence of the formula made it more difficult for Brazil to reduce inflation. As explained above, the working of the formula undoubtedly helped to achieve the sharp reduction in inflation in the mid-1960s. Between 1968 and 1973, however, wage adjustments under the revised formula were similar to those which would have occurred under a scheme of compensation for past inflation plus a small productivity allowance. Success in reducing inflation under such a wage system depended largely on setting the productivity allowance in the wage formula below the actual increase in labor productivity. The Brazilian authorities believed that they were, in fact, underestimating productivity gains from 1968 to 1973, and they expected inflation to decline gradually for this reason. In retrospect, however, the underestimation of productivity appears to have been small, or to have been offset by other factors -- including the provision that firms with exceptionally large productivity gains could give wage increases larger than dictated by the formula provided they absorbed the extra cost.

Since 1968 Brazil's revised wage formula probably has tended to perpetuate past price rises without any significant effect in either accelerating or decelerating inflation from the existing rate. There have been occasions during that period, however, when exogenous forces tended to change the rate of inflation. For example, in 1972 relatively good harvests led to a decline in the rate of price increases; and more recently the sharp increase in world prices of petroleum and other commodities, together with excess domestic demand, produced an acceleration in Brazil's inflation. Once these price trends were set in motion, either increasing or decreasing the previous rate of inflation, the wage formula tended to reinforce the trend. However, the reinforcement of price trends probably was less pronounced than under the system of collective bargaining and escalator clauses which existed before the 1964 reform. This is largely because, as explained above, the Brazilian formula adjusts wages to compensate for actual price trends only when the 12 month contract expires, which means that wage payments do not fully reflect new price trends until a full year has elapsed. 1/

1/ This lag produced a large decline in real wages when inflation accelerated from an annual rate of 15 per cent to over 30 per cent in 1974. To offset this, the Government announced a special 10 per cent advance wage increase effective December 1, 1974 for all employees whose wage contracts had been signed between January 1 and June 1, 1974 and therefore had not fully reflected the acceleration of inflation which occurred in the second quarter of this year.

## 3. Other areas of indexing

Apart from wages, Treasury Bonds, and mortgages, the other principal areas where some form of indexing is used in Brazil are house rents and certain types of fiscal transactions.

During the late 1960s and early 1970s, three schemes existed for adjusting house rents, depending on when the contracts were signed: (1) contracts signed between 1964 and 1967 were adjusted each year by two thirds of the percentage increase in the minimum wage; (2) contracts signed prior to 1964 were adjusted by the full increase in the minimum wage plus an additional 10 percentage points; and (3) contracts signed after 1967 were free of controls. By 1974, however, most rents payable on pre-1964 contracts have been brought up to the market level, and almost all rent contracts are now freely negotiated. In practice, however, many of these freely negotiated contracts have clauses which link payments to the minimum wage or to Readjustable Treasury Bonds.

In the area of public finances, several types of indexing have been introduced to remove distortion created by inflation. One of the first acts of the Revolutionary Government, in July 1964, was to index unpaid taxes and related liabilities. Taxpayers had used many devices to delay paying taxes, including testing the assessments in the courts, in order to benefit from inflation while the case was under consideration. The 1964 legislation provided that all tax

liabilities not paid in the calendar quarter when they became due would be subject to monetary correction.

The post-1964 tax laws also provided for the annual revaluation of fixed assets and working capital; at present, after several changes, the index for Readjustable Treasury Bonds is used for this purpose. The revaluation of the fixed assets was made mandatory while the revaluation of working capital was optional. Already in 1958 the tax laws had been revised to permit regular revaluation of fixed assets, but under that system a tax of 10 per cent was paid on the revaluation, and depreciation was not permitted on the basis of the higher values. The main effect of this pre-1964 revaluation, therefore, was to reduce taxes on excess profits which were related to the value of a corporation's assets. The new Government reduced and later eliminated the tax on revaluation; even more important, the law was changed to permit depreciation allowed for income tax purposes to be based on the revalued assets.

The 1964 revisions in the fiscal system also had the effect of permitting increases in charges for electricity, telephones, and other public services. Many of these services were provided under concessions which granted a stated return on investment. In the absence of effective revaluation, the value of the base for computing the return decreased progressively in real terms, and new investment in the sector dried up. As explained below, adjustments in charges for public services have increased much faster than general inflation



in the past decade, and this provision for automatic revaluation of assets was only one part of the total new policy orientation in this area.

Indexation has been used also--but rather sporadically -- for income tax brackets in Brazil, in order to ensure that the brackets are adjusted upward roughly in line with inflation. This policy antedates the 1964 reform, for already in 1961 the income tax brackets were defined as multiples of the minimum wage and were, therefore, adjusted automatically each time the minimum wage was changed. This link to wages proved unsatisfactory after 1964, when minimum wages for two or three years were adjusted upward by a lower percentage than the increase in prices, resulting in increased income tax burdens at all levels of real income. This result was not desired by the Government, and in November 1964 the law was modified to provide that the income tax brackets be adjusted in accordance with movements in prices (whenever inflation was more than 10 per cent in one year or 15 per cent in three years) rather than the minimum wage. A subsequent law, in 1967, gave the Minister of Finance power to adjust brackets in accordance with movements in either prices or the minimum wage, at his discretion. In 1973 and 1974, moreover, the Government departed even further from indexing. In 1973, as part of the policy to improve income distribution, the upper brackets were adjusted upward by 15 percent and the lower brackets by 26 per cents; and in 1974; the upper brackets were raised by 12 per cent and the lower ones by as much as 41 per cent. Thus, the authorities have exercised a

considerable amount of discretion in adjusting the tax brackets in the past decade. Although the brackets have been adjusted upward regularly, the size of the increase has been dictated by general policy considerations rather than by rigid adherence to an index.

### III. Other Methods of Adjusting for Inflation

The preceding section described the system of indexing in Brazil, pointing out that its use is less extensive than sometimes suggested and that even in areas where indexing is applied, the procedures are changed frequently in accordance with the overall policy goals, thereby reducing the automaticity of the system. The present section describe the policies with respect to two other important economic variables-- the exchange rate and charges for public services-- where adjustments also have been made regularly to offset the effect of rising prices, but without any rigid system of indexing

#### 1. The system of mini-devaluations

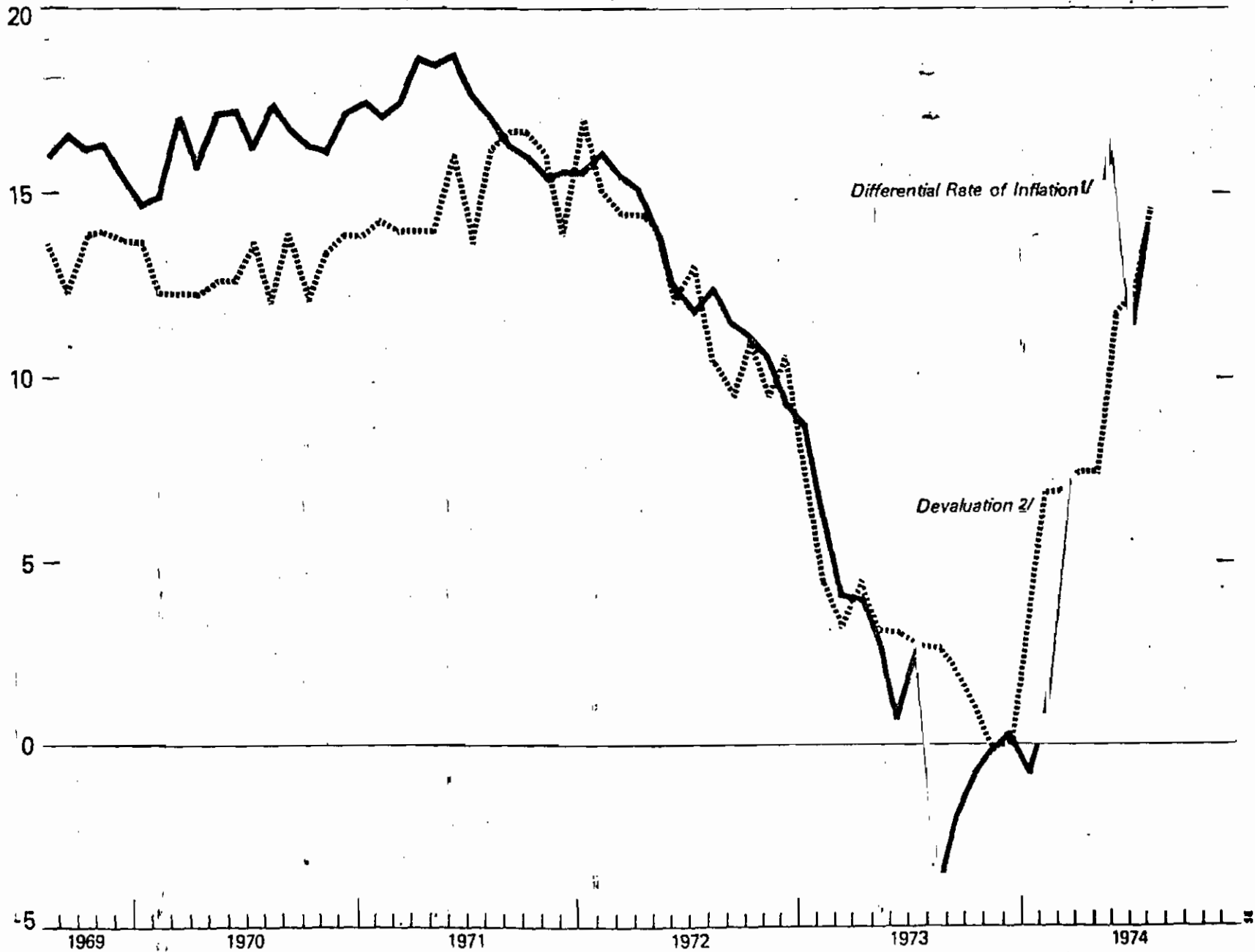
In August 1968 the cruzeiro was devalued by 13 per cent in terms of cruzeiros per U.S. dollar, and the authorities announced that in the future it would be devalued frequently by small amounts. The criteria used for adjusting the rate would be price changes in Brazil compared with those abroad, the level of international reserves, and the behavior of exports. In practices, the rate of devaluation

of the cruzeiro since 1968 has been approximately equal to the difference between inflation in Brazil and in the United States. This can be seen in Chart 4 which compares the annual rate of depreciation of the cruzeiro with the differential inflation rate in the two countries.

Prior to, 1968 devaluation in Brazil has been much more sportadic and were often delayed for long periods because of political considerations. When the adjustment of the exchange rate finally occurred, the change was often as large as 20 - 30 per cent. Under that previous system there was a great incentive to speculate on the change, with damaging consequences for the economy. Firms hesitated to contract foreign obligations, because the economic results of investments financed by foreign borrowing would often depend mainly on the accident of whether a loan was repaid shortly before or after a devaluation rather than on the merits of the investment itself. Investments for exports were particularly risky, since there was no assurance that the exchange rate existing at any future date would make the product competitive in world market.

Although the cruzeiro has been devalued roughly in line with price differentials in recent years, this has not been done through a formal system of indexing, as is sometimes suggested. The economic authorities have been free to devalue by somewhat more or less than indicated by price differentials if that course seems advisable in the light of overall external and internal policy consideration. In December 1971, for example, the cruzeiro was depreciated fully in line

CHART 4  
 BRAZIL  
 DEVALUATION AND DIFFERENTIAL INFLATION RATES  
 (In percentage change over previous 12 months)



Sources: Central Bank of Brazil; and Fund staff estimates.

1/ Difference in inflation as measured by Brazil's general price index and U.S. wholesale price index.

2/ Devaluation of cruzeiro in terms of U.S. dollars.

with the U.S. dollar; but in February 1973, at the time of the second U.S. dollar devaluation, the cruzeiro was appreciated by 3 per cent with respect to the U.S. dollar. The Brazilian decisions on these occasions were made after considering all the advantages and disadvantages of following the U.S. devaluation (particularly the effects on the balance of payments and domestic prices) and not by a rigidly determined link of the exchange rate to price indexes.

Any attempt to index rigidly Brazil's exchange rate would encounter formidable difficulties. First, there would be the problem of selecting which price series to use in Brazil and in other countries, particularly now that the value of the U.S. dollar is fluctuating with respect to other major currencies. Brazil's combined trade with Europe and Japan has become much larger than trade with the United States, and for many exporters the rate of the cruzeiro in terms of these other currencies is more important than the rate with the U.S. dollar. For exporters, the appropriate exchange rate to index might be the rate with respect to a trade-weighted package of currencies rather than that to the U.S. dollar alone -- although many of Brazil's commodity exports have a world price which is independent of their destination. With regard to foreign borrowing, which has become highly important in Brazil's economic development, over 90 per cent is in U.S. dollars or Euro-dollars; and for these borrowers the relevant exchange rate is that for the U.S. dollar, since the cost of borrowing is the interest rate on dollar loans plus the depreciation of the

cruzeiro in terms of U.S. dollars.

Although the exchange rate is not formally indexed, the authorities have been able through the system of mini-devaluations at frequent, irregular intervals to convince exporters, borrowers, and foreign lenders of their firm intention to maintain a realistic exchange rate. Producers are prepared to undertake long-term investments in the export sector, with the confidence that the exchange rate will be adjusted roughly in line with relative costs and that export prospects will continue to be attractive when the investment is completed. This new policy toward exports, which traditionally was lacking in the Brazilian economy, undoubtedly contributed to the tripling in the U.S. dollar value of Brazil's exports between 1968 and 1973.

## 2. Charges for public sector goods and services

One of the most important achievements in Brazil since 1964 has been the strengthening of public sector finances, which had seriously deteriorated during the years of high inflation. As explained above, this improvement was aided by indexing of tax arrears in order to discourage tax payers from purposely delaying the payment of taxes. Probably the most important innovation in improving public finances, however, has been the policy of frequently adjusting the charges for public sector goods and services-- such as electricity, transportation, water, wheat, and petroleum--in line with the rise in prices.

During the late 1950s and early 1960s, the charges for goods and services supplied by government enterprises had lagged far behind inflation. As inflation accelerated in 1962 and 1963, the Government became even more reluctant to increase the tariffs of the state agencies. By 1963 the charges in real terms for train, bus, and air transportation, telephones, mail, electricity, petroleum, and wheat had fallen to a very low level by international standards, and the agencies responsible for providing these goods and services frequently had operating costs which far exceed their receipts, and their investment programme were at a minimum.

After 1964 the charges for all public sector services were adjusted upward sharply, not only in line with inflation but by amounts greatly exceeding current inflation. It was, in fact, the necessity for a large amount of such corrective inflation that caused the Government to opt for a gradual rather than an abrupt halting of inflation after 1964. By the early 1970s the charges for public services in Brazil were high even by international standards, and the large public sector investment programs being carried out in electricity, transportation, steel, and other areas are being financed to a substantial extent by user charges.

It is important to point out that while these charges for public goods and services have risen roughly in line with inflation in recent years, this not a result of any system of indexing, but rather of discretionary action. As in the case of the exchange rate and

interest rates, the adjustment for inflation in this area is accomplished by administrative decision rather than by an automatic link to prices.

#### IV. Summary & Conclusions

During the past seven years , Brazil has improved its public sector finances, increased private savings and investment, and achieved a strong growth in exports, at a time when inflation averaged about 20 per cent a year. This success was due largely to economic policies which kept interest rates high and made certain that the exchange rate, charges for public services, and tax revenues did not lag behind general price increases, as often occurs in a period of high inflation.

Automatic indexing has played a role, but only a secondary role, in assuring that these key economic variables in the economy kept pace with inflation. The exchange rate and charges for public sector services were adjusted entirely at the discretion of the authorities--not by indexing--although, of course, the general rate of inflation was the most important among the variables taken into consideration. A small portion of total wages in the economy had a tenuous link to prices through the wage formula, but this formula was changed in accordance with the overall policy goals of the Government; wages were not, therefore, indexed in the simple way which is sometimes suggested. In the case of financial assets, indexing occurred mainly



evidence that widespread indexing is the most appropriate way to achieve this goal. Rather it would seem to indicate that firm discretionary action by economic managers is the main road to success, and that indexing should be selective, flexible, and subordinated to the general policy considerations