Project Appraisal in Inflationary Conditions

June 4, 1969

This paper discusses some general difficulties in project appraisal under inflationary conditions and how they might be overcome. The paper presents evidence of large fluctuations in relative prices apparently attributable to inflation. Hence, it is pointed out, current market prices are a poor measure of social value in that case and either long-run average market prices or world prices must be used in economic rate-of-return calculations. Large price fluctuations also require a more careful examination of financial incentives and riskiness as viewed by participants in a project. Finally, inflation requires policy measures to assure the financial viability of a project. Fixed interest rate charges which do not adequately compensate lenders for the devaluation of money, would require subsidization of financial intermediaries and cause misallocation of capital. The paper discusses alternative methods for adjusting interest rate charges to take account of inflation.

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PART I. INTRODUCTION

The Nature and Incidence of Inflation

1. Inflation is a widespread phenomenon today, defined as a general and sustained rise in a country's price level. It affects developed as well as underdeveloped countries and tends to dig itself into the economic organism in such a way that it becomes extremely difficult, and sometimes quite painful, to handle. In this paper, we will not be concerned with the causes or effects of inflation in general, but only its effects on the evaluation and operation of projects.

2. Nor will we deal with sporadic inflation or hyperinflation; we will concern ourselves with the kind of inflation which follows some semblance of a pattern or sequence. In these cases the worst effects of inflation happen in the early stages where the institutions and economic habits of the country have not adapted to living with continuous price increases. The structure of investment and savings, the pattern of demand and the distribution of income are most askew during this phase and it is clearly impossible to predict future behavior with any hope of accuracy. But once the economy has settled down to living with inflation, behavior starts to conform to more stable patterns and long-term economic forces reassert themselves. Distortions are always present, and the struggle to keep abreast of the falling value of money never abates, but the strains and stresses become institutionalized and predictable to some extent. In the long run, this institutionalization constitutes the strongest force in the perpetuation of inflation.

3. If a project is to be undertaken under circumstances of erratic and sudden inflation, the best solution is to assume constant relative prices and relinquish all hope of accurate forecasting. Experience does not provide any guide in such cases and a priori reasoning is irrelevant. Hyperinflation falls into the same category, since normal market relations cease to exist and prices change wildly. We will confine ourselves to cases where inflations have long histories and where it is unlikely that they will come to quick ends.

4. In the underdeveloped world, there is a set of countries that suffers from very high rates of inflation, over 10 percent per annum in the last decade: Argentina, Brazil, Chile, Colombia and Uruguay.1/ There are other countries in which price rises are lower or less sustained: Ghana, India, Peru and Vietnam are good examples. There are yet others whose economies experience mild spurts of price increases occasionally, but cannot be regarded as inflationary in a real sense. And there are countries which have suffered from hyperinflation, where the monetary system degenerates into chaos and ultimate breakdown: Indonesia until recently is a case in point.

1/ If we take 1958 as the base year, we find that the cost-of-living indices had risen by late 1967 to 1360 in Argentina, 3990 in Brazil, 767 in Chile, 259 in Colombia, and 2040 in Uruguay.
5. In this study, we shall focus mainly on the first group, the high-inflation countries, all in Latin America. In these countries inflation has existed long enough for its effects to become fully apparent, and it may reasonably be expected to continue for some years to come without completely dying out or accelerating into hyperinflation.

6. For the purposes of this paper, projects may be divided into two broad types: direct investments and loans to intermediate institutions for relending to some selected sector of the economy. Though inflation creates different problems for these two types of projects, all problems arise from the changes in relative prices that typically occur during an inflationary process. If all prices rose at exactly the same rate, including the rate of interest and the value of deferred payments, there would be no problem at all, since in real terms the situation would be identical to one of constant prices. But when relative prices change, problems arise for projects that consist of direct investment, from the leads and lags of various prices and from the distortions they cause, both for economic and for financial appraisal; for projects consisting of lending to financial intermediaries, problems arise from the fall in the real value of future payments relative to their current value, and from the decline in the real rate of interest relative to the value of capital.

The Characteristics of Sustained Inflation

7. The tables below illustrate the changes in relative prices in Brazil during the period 1960-66. Table 1 shows annual percentage changes in some selected prices, while Table 2 shows the relative changes in these prices in index form.

Table 1: Brazil: Rates of Change in Prices
(Annual Averages - Percent)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost of Living (excl. Coffee)</th>
<th>Total Agriculture (excl. Coffee)</th>
<th>Construction Cost</th>
<th>General Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>29.3</td>
<td>31.5</td>
<td>41.3</td>
<td>23.5</td>
</tr>
<tr>
<td>1961</td>
<td>33.4</td>
<td>40.3</td>
<td>38.1</td>
<td>42.5</td>
</tr>
<tr>
<td>1962</td>
<td>51.6</td>
<td>50.1</td>
<td>57.0</td>
<td>44.9</td>
</tr>
<tr>
<td>1963</td>
<td>70.5</td>
<td>76.4</td>
<td>69.3</td>
<td>83.4</td>
</tr>
<tr>
<td>1964</td>
<td>91.7</td>
<td>81.3</td>
<td>79.2</td>
<td>83.3</td>
</tr>
<tr>
<td>1965</td>
<td>65.7</td>
<td>53.6</td>
<td>61.5</td>
<td>69.8</td>
</tr>
<tr>
<td>1966</td>
<td>41.3</td>
<td>39.8</td>
<td>49.2</td>
<td>32.0</td>
</tr>
</tbody>
</table>

Source: Getulio Vargas Foundation, given in Economic Growth of Brazil, Problems and Projects, IBRD, Vol. II, Section 2, Table 5 (October 23, 1967).
Table 2: Brazil: Index of Changes in Relative Prices  
(1961 = 100)

<table>
<thead>
<tr>
<th>Year</th>
<th>Agriculture/Industry</th>
<th>Industry/General</th>
<th>Agriculture/General</th>
<th>Construction/General</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>196</td>
<td>73</td>
<td>140</td>
<td>51</td>
</tr>
<tr>
<td>1961</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1962</td>
<td>101</td>
<td>77</td>
<td>108</td>
<td>70</td>
</tr>
<tr>
<td>1963</td>
<td>92</td>
<td>100</td>
<td>80</td>
<td>103</td>
</tr>
<tr>
<td>1964</td>
<td>106</td>
<td>81</td>
<td>85</td>
<td>78</td>
</tr>
<tr>
<td>1965</td>
<td>81</td>
<td>96</td>
<td>77</td>
<td>104</td>
</tr>
<tr>
<td>1966</td>
<td>171</td>
<td>74</td>
<td>127</td>
<td>82</td>
</tr>
</tbody>
</table>

8. The indices from Table 2 are illustrated graphically in Figure 1. Clearly the relative price changes are fairly substantial, especially for agriculture/industry. Even the least fluctuating line, industry/general, shows changes of 15-25 percent from year to year; all the others show changes of much greater magnitude, 5-50 percent for agriculture/general and 25-50 percent for construction/general. Relative price changes of this magnitude are almost certainly due in part to inflationary pressures; ordinary market forces in stable conditions do not create relative changes of this order year after year.

9. For an inflationary economy, such wide swings are only to be expected. After all, inflation is a process of constant friction and competition between different sectors of the economy, each endeavoring to maintain or increase its real share of national income, and it is kept alive simply because one or another sector has fallen behind and is trying to catch up. It is probably safe to assume that in the long run, no sector is really left behind in terms of its real price falling below the others, but in the short term, some prices tend to lead and others to lag, with no clearly discernible pattern in the timing and extent of leads and lags.

10. The exceptions to this picture are created by certain institutional and administrative pressures which tend to make certain important prices lag behind others while other prices lead or lag in an erratic or cyclical manner.

11. Public Utility Prices. These seem in most cases to be adjusted rather less often and to a lesser extent than would be required if they were to keep pace with the general inflation. The main reasons for this are the government's desire to prevent the spread of inflation and the rigid institutional arrangements for changing rates. Adjustments are occasionally made to bring public utility prices in line with inflation, but on the average they tend to lag. In fact, the subsidization of public utilities is a major force in the perpetuation of inflation.
12. Controlled Prices. In a similar, misguided, attempt to control inflation governments sometimes impose price control on commodities considered as essential (like food); these controls can be maintained over long periods, usually to the detriment of production and investment in the controlled sector. Without controls, the price of food is in many cases one of the leading prices in inflations, especially when the agricultural sector is not expanding rapidly enough to keep pace with demand.

13. Rate of Interest. In institutional money markets, the rate of interest generally lags behind the rate of inflation, sometimes to the extent that long-term lending is completely choked off. In non-institutional markets, the rates adjust to inflation, but such markets are quite narrow and confined to fairly short-term transactions.

14. Rate of Exchange. Most highly inflationary countries, with the recent exception of Chile, adjust the rate of exchange only periodically to the declining value of the domestic currency. Between the devaluations, consequently, the rate lags behind the inflation and the currency rapidly becomes overvalued.

15. While these kinds of prices tend to lag behind the general price level, others lead or lag unpredictably. As the tables above show, the cycles are not of even amplitude, as they are determined by a host of forces, such as: rate of inflation, the relative strength of the sector, the cost and demand factors, the success of the harvest, and other normal market forces which would cause relative price changes in any case. The table below shows for Argentina the cyclical fluctuation in real wages and the lagging tendency in the rate of exchange.

Table 3: Argentina: Annual Rates of Change in Prices (Percent)

<table>
<thead>
<tr>
<th>Cost of Living</th>
<th>Nominal Wages</th>
<th>Foreign Exchange Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>32</td>
<td>47</td>
</tr>
<tr>
<td>1959</td>
<td>114</td>
<td>68</td>
</tr>
<tr>
<td>1960</td>
<td>27</td>
<td>17</td>
</tr>
<tr>
<td>1961</td>
<td>114</td>
<td>25</td>
</tr>
<tr>
<td>1962</td>
<td>28</td>
<td>25</td>
</tr>
<tr>
<td>1963</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>1964</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>1965</td>
<td>29</td>
<td>35</td>
</tr>
<tr>
<td>1966</td>
<td>32</td>
<td>33</td>
</tr>
</tbody>
</table>


16. The exact nature of relative price changes is of crucial importance to project evaluation. In the next two parts of this paper we shall consider two distinct problems in project appraisal and implementation: in Part II we
shall discuss the difficulties created by inflation for the economic and financial appraisal of projects consisting of direct investments; in Part III we shall discuss the difficulties created by inflation for projects that involve lending to financial intermediaries.
PART II. PROBLEMS CREATED BY INFLATION IN PROJECT APPRAISAL

17. There are two aspects of project evaluation which are relevant to the present problem: the appraisal of economic merit; and the appraisal of financial viability. The appraisal of economic merit consists of balancing the true costs of the project against its true benefits to the economy as a whole, allowing for the passage of time by discounting. The appraisal of financial viability consists of projecting the future monetary revenues and expenditures, and the consequent monetary returns to the beneficiary. The former determines whether the investment is justified from the point of view of the economy as a whole; the latter shows whether the entity responsible for the operation of the project can be financially viable in the long run. The two kinds of appraisal present different problems under inflationary conditions.

18. A distinction has been made in this paper between three kinds of prices: market prices, shadow prices and real prices. Market prices are clear enough. Shadow prices refer to values imputed to various goods and factors based on their true value (or opportunity cost) to the economy. Real prices stand for market prices corrected for inflation, in other words, for market prices stated in terms of constant value, and not for opportunity cost or shadow prices as defined above. The discussion of economic appraisal has been conducted in terms of shadow prices, and that of financial appraisal in terms of real prices.

A. Economic Appraisal

19. The determination of the economic merits of a project from the point of view of an aid donor or a government depends on the balancing of benefits derived by the whole economy from the project against the true costs of the investment and operation of the project. These benefits and costs can be read off directly from the market if market prices show correctly the true value of goods and the opportunity cost of factors (i.e., their shadow prices). The conditions theoretically required for market prices to correspond exactly to shadow prices are very stringent - full employment, perfect competition, perfect mobility, and the like - and are not found in the real world. However, unless there is special cause to believe that market prices are grossly distorted, one can perfectly well use them in project appraisal, since the effort of making minor corrections is probably not justified by the rewards of somehow better project appraisal. Where there are large distortions, say, massive unemployment or heavy indirect taxation, market prices can be adjusted to get a closer approximation to the shadow prices. There are many problems facing this sort of adjustment, but in principle they can be accepted as desirable.
20. Let us now assume, first, that some rough but acceptable techniques exist for assigning shadow prices (not in a linear programming sense) to a few obviously distorted market prices under stable conditions; second, that sufficient knowledge of the long-term forces in the economy exists for the project evaluator to forecast market or shadow prices (whichever is used) over the life of the project; and, third, that the risk and uncertainty inherent in these forecasts are also calculable. In effect, we assume that a good project evaluation is possible if the country in question is not suffering from inflation.

21. Now introduce a state of high and prolonged inflation, one which has been in existence long enough for all sectors and institutions to adapt to it, and which is expected to continue for some time to come. The project evaluator now faces the following difficulties caused specifically by inflation.

The Shadow Pricing Problem

22. First, in terms of the calculation of present shadow prices, a hard enough task in the best of conditions, there are two new problems. Inflation causes market prices to diverge even more from shadow prices than otherwise by its erratic effect on the relationship between prices. It is clear from the kaleidoscopic nature of price relationships in the short term that these relationships at any particular point of time will be quite different from the relationships that would obtain under price stability. The calculation of shadow prices under stability is largely based on the correction of a few market prices, the unchanged ones being accepted as being more or less correct. In inflation, the relationship of prices would differ widely, depending on the arbitrary time chosen to evaluate the project, and the number of prices to be corrected would probably be much larger than with stability.

23. Inflation causes not only changes in relative prices but also in underlying economic conditions of the economy. It is well known that inflation has several undesirable effects on the structure of an economy, mainly on the level and form of savings, the pattern of investment, exports and imports. It would be beyond the scope of this paper to discuss these effects. It need only be said that they render shadow pricing even more difficult than before, especially with regard to prices such as the rate of exchange, the rate of interest and the structure of interest rates, and the prices applying to controlled products.

24. For the calculation of future shadow prices, inflation has two corresponding effects. Insofar as the prediction of the relevant shadow prices depends on the prediction of market prices, with or without correction, inflation creates enormous difficulties because inflation makes the prediction of market prices almost impossible. Even if inflation causes no structural distortions and even if the long-term trends of the basic economic factors (savings, investment, trade, productivity, etc.) were known, the prediction of

1/ The literature on this subject is vast. For a brief discussion see Stanley Please's draft study, "Value Linking of Domestic Bond Issues", IBRD, Economics Department, January 2, 1969.
market prices would be impossible for periods longer than one to two years.\(^1\)

And since proper project evaluation should make year-to-year projections of factors that affect the project over its entire life, inflation confines the evaluation to inferior results.

25. The structural distortions caused by severe inflation occur not just once; they continue as long as the relationships between different prices keep changing. We chose the assumption of a prolonged inflation; short bursts of inflation create even greater problems because the economy does not have time to adapt to inflationary conditions or to learn to live with them. The worst distortions, in inventory speculation, real estate investment, absence of long-term investment, capital flights, foreign exchange rate overvaluation and others, occur in the preliminary stages of inflation; after some experience of inflation these distortions, though never eliminated, are reduced. The degree of distortion varies from country to country, depending on how variable the rate of inflation is, how rapidly relative prices change, and how the economy develops. In any case, the continuous structural changes caused by prolonged inflation have to be accounted for in predicting shadow prices over the project's life. This fact compounds all the problems mentioned above.

The Risk Evaluation Problem

26. For the calculation of risk and uncertainty, inflation also creates difficulties, because there is little experience on which to base the subjective probabilities of different outcomes. In stable economies the project evaluator has some idea of the likelihood of the market behaving in certain ways, based on his experience and knowledge of changes occurring in relevant factors; in highly inflationary economies the market is intrinsically erratic and no amount of knowledge can enable one to predict prices and costs far into the future or to know the probability of different prices and costs.

Some Approaches to the Problems

27. What can be done then to evaluate the economic costs and benefits of prospective investments? There is no solution which is completely satisfactory; the very nature of the problem is such that, inflation or no inflation, a lot of guesswork is involved. Inflation merely serves to compound the difficulties and increase the risk of error in all the calculations; it does not rule out the calculations altogether. We may suggest some simplifications which reduce the problem to more manageable proportions.

28. First, we must be careful to distinguish in the calculation of economic benefits between projects where benefits are normally represented adequately by market prices (agricultural and industrial projects where the output is freely sold in competitive markets), and those where the benefits are usually not properly shown by market prices (public utilities, education and so on). For the former type of project the evaluation of benefits consists

\(^1\) See, Section B, "Predicting Market Prices," pages 12-15.
of predicting market prices, and adjusting them for the fall in the value of money; this is discussed in Section B. For the latter we have nothing new to suggest as far as the quantification of extra-market benefit goes; the calculation of market benefits, insofar as this consists of estimating revenues from regulated prices, is also discussed in Section B.

29. The calculation of the true costs of a project under high inflation has to deal with the difficulties of relative price distortion and structural distortion described above.

30. Relative price distortion should be corrected by some means of shadow pricing. It is merely another cause of market divergence from real conditions and accordingly should be corrected in the same way as over-priced labor, over-valued exchange rate, negative rates of interest, or under-priced public utilities. It is not necessarily true that inflation always causes market prices to diverge more from shadow prices than a stable economic situation does; the problem arises more from the fact that the divergence itself is haphazard and constantly changing as the relative prices shift around from year to year. The structure of relative prices, if constant, shows the value of each factor and commodity relative to all others in the most convenient and direct form; if the structure is inconstant, each relative value has to be calculated separately.

31. All methods of shadow pricing are at this stage imperfect, although they are undoubtedly being improved, and all of them face various conceptual and statistical problems. Perhaps the simplest to apply is the one suggested by I. M. D. Little and J. Mirrlees in Manual of Industrial Project Analysis in Developing Countries, Volume II, O.E.C.D., 1969, which uses international prices for all goods which are traded or reduced to traded inputs, and imputes prices to non-traded inputs like labor.

32. Labor costs can be worked out by a complicated formula which takes into account the loss in production in the sector from which it is drawn, the cost in terms of increased consumption from the wages paid, and the cost of settling the workers on the project site. It can be put roughly halfway between a zero shadow wage rate and the nominal wages paid.

33. All this is for present costs. For predicting future costs, the constantly changing pattern of relative prices needs to be reduced to long-term trends, based partly on a projection of trends in international prices and partly on knowledge of the real factors in the economy. Shadow wages can, for instance, be assumed to rise in line with labor productivity; the terms of trade of agriculture in relation to industry can be forecast from past trends; the price of power can be forecast on the basis of the cost of providing it in the future, in real terms of the international prices of its inputs and expected rise in shadow wages; and so on. The essence of the whole procedure is that relative price changes which are temporary aberrations should not enter into true costs, while the relative price changes caused by underlying economic forces should be taken into account by any means possible.

34. In summary, inflation makes the use of shadow prices more desirable for project appraisal but makes them more difficult to determine. In the present state of the art the problems cannot be fully solved, but ways can be
found of getting around them or, when necessary, of ignoring them. The problems created by the rapidly changing price structure can be resolved with reasonable satisfaction. However, project evaluation under inflation will be more uncertain, more prone to error, and more based on guesswork than an evaluation in stable conditions. Moreover, this can never be avoided, since inflation is basically a condition of uncertainty and flux.

B. Financial Appraisal

35. The financial appraisal of projects shows the viability of the agency operating the investment, except in the case of projects which are not selling their output commercially, e.g., education. It can also be used to show the desirability of a project (in cases where economic benefits are not calculable). The former kind of financial appraisal examines the financial position of the entire entity, a power company or a waterwork authority, for instance, to determine whether it will be able to run on a financially sound basis; the latter looks only at the project and isolates its costs and revenues from that of the parent company. Both kinds of financial analysis face the same problems under inflation.

36. In contrast to economic analysis, financial analysis must measure benefits and costs in market prices. If one views market price swings as both erratic and short-term, then in the longer term over the life of the project they may be expected to cancel each other out without any substantial bias on the total result. Real wages (i.e., money wages in constant terms), cannot, for instance, go on falling for a long time; after a few years the labor unions are almost sure to turn the tables in their favor and get higher increases than the rate of inflation. Similarly, imported goods will get relatively cheaper during the period before exchange rate adjustment. Then their prices will suddenly rise when the currency is devalued, and may temporarily overshoot the inflation.

37. In general, it seems very likely that the different economic groups will be pulling and pushing to increase or regain their real incomes, and in the long run most of them will end up in their original positions.

38. This does not mean, however, that we can ignore such market price swings over the life of a project, because the different periods that make up the long term are not equally important to us. Since we discount the future, the latter years have less and less importance, while events in the initial years (the first five or seven years) carry the greatest weight. So if real wages rise significantly over the first five years and fall thereafter, the weight of rising costs will be larger than that of the subsequent decline. Changes occurring after the first few years of the project's life can be assumed to cancel out or become insignificant. While this is not a rigorously correct procedure, it is certainly one which simplifies the problem, yet it does not unduly distort the truth. The forecasting problem then boils down to predicting relative changes among the most important elements of cost and revenue for the first five to seven years of a project's life.
This is the only possible solution for projects that depend for their income on market prices, as do those in agriculture and industry. For project agencies that can regulate the price of their output because of their monopolistic or legal position (public utility and transport operations), the solution is simpler. Let us consider the cases of price prediction and price regulation in turn.

Predicting Market Prices

The difficulties in prediction will vary with the composition of the goods and services which make up the inputs and outputs of the project being appraised. We have said that certain prices (public utility and transport rates, interest and exchange rates) tend to lag behind the rate of inflation in steadily inflating countries (see paragraphs 11-14 above). These prices may at times catch up or exceed other prices, but their adjustment is periodic and in some cases predictable. Other prices tend to lead the general inflation in certain situations, such as the prices of agricultural commodities (unless they are put under price control), wages and so on, with the remainder of the prices tending to rise more or less with the average. Wages play a significant role in almost all projects, as does the price of domestically procured inputs (raw materials, power, transportation). Imports may also be important, if, for instance, an agricultural project requires foreign fertilizers or livestock; so may exports, if the project is intended to produce commodities for export.

To simplify the problem, let us assume that all domestic goods except labor and utilities will rise in price with the general price level - in other words, their real price will remain constant - unless there is special cause to expect some commodity to fall out of line. If there is, we must make the best guess possible regarding its future level, based on the particular circumstances of the country. In some cases, the future level of such a price may depend upon government policy, in others upon fortuitous factors like weather; no generalization can be made about them here. So we are left with the prices that may be expected to change relative to the general price level - wages, imports, exports and utilities. Let us consider them in turn to see if they provide some handles that we may grip for prediction.

Real Wage Changes

Wage determination has become quite institutionalized in countries with long inflations; the bargaining system itself now provides one of the strongest pressures for the continuation of inflation. Wages are increased at more or less regular intervals in accordance with some index of inflation, usually the rise in the cost-of-living index during the preceding year. Trade unions are strong and active, and the government participates in wage negotiations in important cases. It would be a reasonable working assumption in such cases to say that real wage, i.e., the wage cost in constant money terms, increases over the long run at the same rate as productivity; in other words, labor's share of the increasing national product remains stable. In the short run, as argued above (paragraph 15), the level of real wages will fluctuate cyclically around the long-run trend, the amplitude and duration of the cycles
being determined primarily by the rate of inflation and the bargaining power of unions. For instance, if inflation suddenly accelerates over three to four years, real wages will fall continuously if they are adjusted for the rise in prices during the previous year; similarly, if inflation decelerates, real wages will rise. It would not be too difficult, given an intimate knowledge of the institutional arrangements and barring any major change in the economic situation, to predict roughly the future course of real wages if the future course of inflation were known.

43. In some cases governments intervene in the wage-determination process as part of anti-inflationary policy. Such intervention usually takes the form of a ceiling imposed on wage increases, depressing real wages below what they would otherwise be. With strong support and great determination, the government can persuade or coerce unions to follow its line - provided that economic circumstances turn out in the government's favor, i.e., that the rate of inflation is considerably reduced, and the usual inflation generating forces (notably large public sector deficits) are strictly controlled. In recent experience, wage restraint could not be maintained for long because the primary inflationary factors had not been controlled. For the purpose of prediction, therefore, government assurances on the future of wages have little value beyond one, or possibly two, years. Any longer-range forecast becomes inextricably involved with a prediction of the course of inflation itself.

Trade Price Changes

44. The prediction of domestic import and export prices, i.e., of the exchange rate, tariff and subsidy policies, requires that one predict both the rate of inflation and government policy. If the exchange rate is devalued continuously to maintain a realistic relationship between the external and internal values of the country's currency, the domestic price of imports and exports will remain constant in real terms. If, on the other hand, devaluation is periodic, the price of imports will fall relative to other prices in the interim periods and rise suddenly whenever the exchange rate is adjusted, and the price of exports will behave in the same manner.

45. The actual domestic price of imports and exports may not exhibit this sharp cyclical fluctuation if tariffs and subsidies are used to maintain balance in external payments; the ultimate effect then depends on the combination of exchange rate and fiscal policies by the authorities. Some imports will be heavily taxed, others let in without tariff, and others completely excluded; similarly, some exports will be subsidized, others left to flounder. The effects of inflation per se will be felt more by the relative untaxed imports, such as vital raw materials and some capital goods, and by unsubsidized exports. These will suffer the cycles in price engendered by inflation and a lagging exchange rate. Prediction of their prices will be very difficult, as with money wages.

Utility Price Changes

46. Public utility prices are in many cases out of line with the general price level in inflation, as described above in paragraph 11. The real price of public utilities is allowed to fall for a considerable period
before adjustment is made. Clearly the lags depend on the rate at which inflation is proceeding and on the extent to which the government is prepared to subsidize utility operations.

47. In all these cases, therefore, where price depends on administrative decision or institutional bargaining rather than on free market forces, the future course of prices depends on the rate of inflation and on government policy. Government policy is itself to some extent influenced by the course of inflation, which in turn is largely dependent on the ability of the government to reduce deficit financing. If we can forecast changes in the general price level for the required period, then we can, bearing in mind the simplifications introduced in paragraphs 38 and 41, assess the direction and speed of change of other prices in real terms. If, for instance, the inflation is expected to accelerate, the variables that react with a lag (real wages and public utilities) can be expected to suffer a fall in their real price while others (real profits, agricultural goods) can be expected to enjoy a rise. The rate of acceleration will also be of great importance, because on it will depend a multitude of induced reactions (wage negotiations, exchange rate policy, and so on).

The Unpredictable Pace of Inflation

48. But how can one foretell the pace of inflation? Even under relatively steady inflationary conditions, prices vary from month to month and year to year, in reaction to a complex mixture of political, social and economic forces. A simple indicator like the supply of money, which seems to move closely in line with prices, may be misleading for the purposes of prediction because it may at times be the causative and at other times the permissive factor. There are, as mentioned before, some factors which steadily generate inflation - public utility deficits, for instance, or deficit financing of budgetary expenditures. There are other factors which are accidental and unpredictable, like a sudden deterioration in the terms of trade or a harvest failure, and which may cause a substantial expansion in money supply unexpectedly. Furthermore, these unpredictable factors may also force the authorities to abandon anti-inflationary policies and relinquish their targets for containing price increases.

49. As a consequence, the prediction of inflation is an almost hopeless task beyond the short period of about one year. A longer prediction would be feasible only if the government committed itself to controlling inflation regardless of consequences; but no government can ever disregard consequences, especially not where the affected interests are powerful and numerous. Any untoward circumstance may cause a collapse of the most determined policy when the consequence of the policy turns out to be severe depression and unemployment. This is not to suggest that inflation cannot be controlled; it can and has been (e.g., in Mexico). But the process of control is difficult and requires the support not only of the people but of various other groups with economic power; the sacrifice that stabilization requires may be too much for the country to bear if the economic circumstances are not just right. Experience in the high-inflation Latin American countries shows that government predictions about inflation rarely match subsequent events; an outside observer's guess can turn out to be as good as the government's.
50. In sum, the prediction of prices and profitability over the life of the project or even over the first few years seems pretty hopeless. Accurate forecasts cannot be made for periods longer than a year or two, if that long. Anything beyond two years is pure guesswork. Where does this leave us? If the financial analysis of a project that has been shown to be economically justified is not possible, in the sense that long-term projections of market prices are expected to be wildly inaccurate, it does not necessarily mean that the project should not be undertaken. An appropriate application of taxes and subsidies can ensure the financial viability of the project: if the project runs into financial difficulties it should be subsidized by the government, and if it makes excessive profits it should be taxed. This should provide a sufficient safeguard to the problems created by inflation.

51. It must be admitted, however, that the provision of subsidy opens the door to its abuse. A project may be economically justified in its conception, yet may turn out to be unprofitable because it is badly operated rather than because of inflationary price distortions. In such cases what is needed is not subsidy but perhaps a change of management or stricter control of production. It is impossible to generalize on this point, but on the whole the dangers do not seem to outweigh the advantages. In any case, inflation would tend to conceal inefficiency rather than penalize it as compared to a stable situation, and in most cases there would be no need for subsidization (with the obvious exception of price-controlled utilities).

The Case of Regulated Prices

52. In projects where the price of output can be directly controlled by the producer, there is no need to forecast costs and prices with great accuracy. All that needs to be done is to stipulate that prices will be varied in such a way as to maintain a given financial rate of return on net assets over a certain period. This is in fact what is done for public utility projects in the Bank. It is a perfectly reasonable and practical method of ensuring financial adequacy of the borrower.¹/¹

¹/¹ That is, as long as the borrower abides by the covenant. Some doubt has been cast upon whether this is so, but we do not possess sufficient information to decide whether actual infringements have taken place.
PART III. PROBLEMS CREATED BY INFLATION IN LENDING THROUGH INTERMEDIARIES

53. A substantial part of the Bank group's operations consists of credit projects, i.e., loans to national financial intermediaries for relending to some selected sector of the economy. The financial intermediaries here concerned are those institutions that provide medium and long-term credit to industry, such as development finance companies, and to agriculture, such as agricultural, or livestock, credit banks. These institutions provide important services on the side of both savings and investment. On the savings side, they act as repositories of the long-term savings of people who do not have direct access to, or are not interested in, equity investment, and who are not ideally served by commercial banks with their low interest rates and essentially short-term facilities. They tend to deal with people who would otherwise find it inconvenient, even impossible, to accumulate savings in monetary form, for instance, agricultural savers and small urban savers. On the side of investment, they provide an invaluable addition to the flow of long-term monetary capital by tapping savings which would otherwise be unused; and they help channel capital to relatively neglected or needy sectors of the economy such as livestock farming, agriculture in general, and risky industrial enterprises.

A. The Damaging Effects

54. Inflation damages the conditions required for the success of financial intermediaries in various ways:

(1) by rendering money and assets designated in terms of money unattractive as a form of saving, it both reduces the total amount of personal (though perhaps not corporate) saving and directs much of what is saved into non-productive forms like real estate, gold and foreign currencies;

(2) by offering an unwarranted transfer of real purchasing power from lender to borrower it reduces the attractiveness of lending;

(3) by lowering or nullifying the real interest charged on loans it destroys the essential allocative function of the rate of interest, and permits credit to be used for unproductive but not unprofitable speculative activity;

(4) by introducing a large element of uncertainty about the future value of money it shortens the time horizon of both lenders and borrowers, inducing them to commit themselves, if at all, for shorter periods than under stable conditions;

(5) by eroding the real value of the intermediaries' financial assets it endangers their very existence;

1/ The appraisal of the specific projects ultimately financed by these loans faces, of course, the same problems as discussed in Part II.
by causing the government in many cases to impose price controls on selected sectors, particularly agriculture, it throttles economic activity in those sectors and thus harms the intermediaries dealing in them.

From the Bank's point of view the damages to efficient allocation of funds and to the stability of the intermediary are of special and immediate concern, though in the long run all the above effects are relevant to the success of intermediary institutions.

Where inflation has to be accepted as a fact of life for some years to come, it becomes necessary to counter in some way its undesirable effects in order to ensure the effectiveness and success of financial intermediaries. The best technique would be one which reproduced the conditions of price stability, in other words, one which fostered accumulation of long-term savings at constant real value at an appropriate real rate of interest, lending for long periods at constant value and a suitable real rate of interest, and the preservation of earning power in the sectors in which the intermediaries deal. Clearly it would be difficult to do away with all the deleterious effects of inflation with one technique of compensation; two or more could be used in conjunction to achieve the best result.

B. Four Possible Remedies

Various methods have been suggested to counteract inflation. We start with the least satisfactory and work up to what we consider the best techniques.

Subsidy Protection

This is a rather special case which applies to financial institutions whose borrowing is in a foreign currency but whose lending is in terms of local currency without provisions for the maintenance of value of repayment in real terms. In such a case, a devaluation would automatically increase the debt burden in terms of the domestic currency of the financial institution without correspondingly increasing its loan receipts. For instance, a livestock credit bank in Argentina receives an interest free loan (from abroad or from the government) of pesos 350 million, to remain equivalent to $1 million, which it lends out for a year. Sometime during the year the peso is devalued by 20 percent, so that the bank's obligations in pesos go up to pesos 420 million while its receipts stay at pesos 350 million plus an interest charge of, say, 7 percent, totalling pesos 375 million by the end of the year. Thus the bank ultimately suffers a loss of pesos 45 million. Such an arrangement can obviously be very dangerous to the institution, and some provision should be made to protect it.

Usually, the national government undertakes the burden of maintaining the value of the intermediary's debts. In Colombia, for example, the government requires its agricultural bank (INOORA) to repay only the amount borrowed; the government meets any difference due to a change in the exchange rates. This method applies, however, to the special case of intermediaries
with foreign liabilities and contributes nothing to the solution of the two major problems created by inflation, of attracting deposits and allocating funds. It only perpetuates previous problems and even accentuates the distortion by drawing from government funds to subsidize borrowers and any possible resource misallocation they may make. It may, however, be used in conjunction with some other technique which solves the domestic distortions faced by the intermediary, and may prove a desirable safeguard to the growth of new institutions.

Higher Interest Rates

59. The natural reaction of a borrowing and lending institution to inflation would be to raise rates paid and charged on its transactions, if this were legally permitted. This may not, however, be a good way of compensating for inflation, for the following reasons:

(1) The actual rates charged for loans have to be fixed before the loan is given, and will thus be based on anticipations of price rises over the life of the loan. Clearly the interest rates would not correspond exactly to the actual inflation and the compensation would be haphazard. The tendency for private institutions would be to over-compensate, that is, to charge higher interest rates than expected rates of inflation, in order to have a margin of safety. This would unduly tax the borrowers, and might depress investment.\(^1\) Official institutions may deliberately wish to undertake the risk of not charging an extra margin above the expected rate of inflation; the government would then have to insure them against the possibility of unplanned losses in real repayments.

(2) The raising of interest rates by itself would not prevent the shortening of lending periods normally occurring in inflations. Both the lender and the borrower would tend to shorten the life of the loan because both prefer to adjust the terms of lending and borrowing to the changing conditions. Inflation has extremely damaging effects on long-term monetary contracts even if interest rates are free to rise, because it introduces a random element of uncertainty. Consequently, long-term investment suffers in favor of shorter-term; the former becomes more difficult to finance by borrowing and re-borrowing while the latter becomes more convenient to both parties. In short inflationary spurts, in particular, this tendency is exaggerated and much institutional lending is specifically directed to self-liquidating (speculative) short-term activity. In more protracted inflations, the natural relation between short- and long-term

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\(^1\) This happened in Brazil in 1965, when the cost of living rose by 45 percent and interest charges in the non-bank credit market rose to over 100 percent per annum for about six months and then fell to about 60-70 percent. This market is supposed to provide a fair indication of the true cost of borrowing in Brazil. See Economic Growth of Brazil, IBRD, October 23, 1967, Vol. I, para. 16.
investment more or less re-establishes itself, but long-term investment is still rarely financed out of borrowing in a free credit market.\(^1\)

65. For these reasons the raising of interest rates is not by itself a satisfactory solution. Besides this, in many countries the government or central bank imposes limits on rates chargeable on loans, so that hidden charges have to be introduced, further complicating matters, introducing legal problems, and increasing uncertainties. And though rates can be raised to extremely high levels for short periods,\(^2\) it is probably impractical to maintain them for extended periods without destroying the fabric of the credit system.

**Shorter Lending Periods**

61. As the foregoing argument shows, this is a natural consequence of inflation. In some cases institutions have adopted it as a deliberate policy when prevented from revising interest rates freely, in order to lessen the inflationary impact. This policy has all the disadvantages mentioned above, plus:

1. It does not provide a way to attract deposits or compensate savers. If interest rates are fixed at negative real levels, all non-commercial bank financial institutions suffer a loss of deposits, for obvious reasons.

2. It does not make for a more rational allocation of credit because no provision is made for charging a realistic price for credit. It continues to subsidize the borrower, but shorter loan periods of, say, three months or even less, cancel out part of the subsidy because of the additional trouble and cost of re-negotiating the loan.

In general, therefore, such a policy must be regarded as a highly undesirable means of combating inflation.

**Adjustment of Terms to Inflation**

62. Theoretically and practically the most satisfactory solution to adjusting either the loan principal and/or interest by some index of inflation; such an adjustment meets the problem directly and provides an adequate answer.

\(^1\) Brazil is again a good case in point. "It appears that during the last eight years virtually the whole value of additions to real fixed assets in private industry was financed by (a) funds generated within the firms involved (62 percent including reinvested profits of foreign firms), and ((b) new foreign investments and net foreign loans to private industry ... Equally striking are the insignificant amounts of medium- and long-term credit that were available to the private industrial sector ... Indeed, since 1964 Bank credit to private industry seems to have financed less than one-half of the total additions to inventories, leaving nothing at all for the growth - which undoubtedly took place - in accounts receivable." Ibid., Vol. I, paras. 95-96.

\(^2\) During the hyperinflation in Germany loans were even made at 20 percent per day.
63. The adjustment of lending terms by an index of inflation is not by any means a new technique. Marshall advocated purchasing power guarantees for loans in 1886, Jevons even earlier in 1875, and Keynes in 1927; in recent years various economists in different countries have advocated this technique for inflationary conditions.1/ Many countries have used and are still using this device in various forms: Finland, Israel, France, the United States, Austria, and some Latin American countries. Finland, in particular, has had an extremely successful experience, and since 1965 the use of the device there has spread to many financial institutions though Finland does not suffer a high rate of inflation (about 16 percent in 10 years).

Objections to Value-Linking

64. Conservative financial circles have, however, resisted the use of value-linked financial paper. If money is the accepted medium of exchange, most people naturally expect it to be also a good store of value; bankers, in particular, are reluctant to introduce a standard of value for deferred payments which is completely divorced from the currency. This reluctance is understandable since a proliferation of different standards may be complicated and difficult, but it is not fully justified, because inflation does have a definite redistributive effect in which lenders lose to borrowers.

65. It is also sometimes argued that the introduction of value-linking by the authorities would be taken by the population as an indication that inflation was acceptable to the government and the central bank and would not be overcome in the near future; this may give rise to destabilizing expectations and exacerbate the inflationary situation. Clearly there is some point in this, and the timing and method of the introduction of a new device containing value-linking can be extremely important. But in a country where inflation has become the normal way of economic life, the danger of a sudden loss of faith in the currency is slight. If the government were to publicize the fact that the fight against inflation would continue and that value-linked instruments were only to safeguard some portion of the population, the resistance could easily be overcome. Experience in different countries shows, moreover, that value-linking has become acceptable with little destabilizing side effects.2/

In the countries we are concerned with, value-linking of some sort is already in use, and the psychological barrier does not exist.

1/ For a good survey of the history and practice of this method, see David Finch, "Purchasing Power Guarantees for Deferred Payments," IMF Staff Papers, February 1956 (pp. 1-22).

2/ Stanley Please, in Value-Linking of Domestic Bond Issues, unpublished draft, IBRD, January 2, 1969, says with reference to Finland and Israel, "But there seemed to be virtually no support for the view ... that the device itself is inflationary because it reinforces peoples' expectations that prices will rise in the future" (page 62).
Choice of Index

66. The chief problem with value-linking is not its acceptability in principle, but the acceptability of the index to be used. The ideal index would reflect the purchasing power of money in the widest possible context, would be suitable to all sectors and areas of the economy, and equally relevant to both borrower and lender.

67. Unfortunately, in both theory and practice, this sort of index does not exist. In theory, an index can be ideal for all value-linking in an economy only if it accurately reflects, without bias or distortion, the declining value of money for all the people engaged in financial transactions in all sectors and areas in that economy. This requires that the economy is small or unified enough that the rate and composition of price changes are more or less similar in every instance. Otherwise the use of a single average index will benefit borrowers and damage lenders in areas where the purchasing power of money declines faster than the average, and damage borrowers and benefit lenders where it declines slower. In large underdeveloped countries like Brazil, wide disparities do in fact exist between the rate and composition of price changes among different regions and between towns and villages, partly because prices in general change erratically at different rates and partly because the structure of relative prices changes differently.

68. In practice, there is an even knottier problem. General price indices of the type that may serve as the ideal index are very difficult to compute for whole countries. The paucity and poor quality of data, the complications of weighting, the problems introduced by price controls, all assume immense dimensions when index coverage is enlarged to include whole countries rather than particular areas. In inflationary countries general indices are compiled only for the largest cities (the cost-of-living index) or for the organized sector (the wholesale price index). They are hardly indicative of price changes in, say, smaller towns or villages, which may be the areas where special financial institutions are particularly needed.

69. For these reasons, therefore, it would be unrealistic and fruitless to search for an ideal index for value-linking. Though an arbitrary average index could be imposed by the government throughout an economy, the result would probably be that in areas obviously out of line with the average index, people would stop using value-linking and rely on some other method of compensating for inflation, or would regress to the point of not entering into financial contracts at all. To introduce value-linking on any scale would consequently require the use of indices appropriate and equitable to the parties concerned in different types of loans in different sectors.

70. But this, too, raises problems. The application of many different indices for value-linking, with different types of borrowers and lenders

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1/ There may also be problems of trustworthiness and acceptability of indices, which are discussed below (pages 22-26).
using different scales of value adjustment, introduces confusion and possible distortions into the finance market. It may even lead to misallocation of resources of the economy and hinder the development of an efficient credit market, perpetuating the divisions between different sectors and preventing an easy interflow of resources. It is difficult to see how these problems can be avoided.

71. Clearly, index-linking, if it is to be used as a tool of economic policy at all, must be used as widely as possible; otherwise the intermediary that uses linking by itself will drive borrowers to other sources of credit while attracting large numbers of lenders. If value-linking is widely used on the basis of different indices, it will create some new distortions. Supporters of value-linking can plausibly argue that the benefits of value-linking will far outweigh its defects, and that the most we can do is to minimize the new distortions.

72. In order to do this, we can set down a simple rule-of-thumb that the index used for value-linking must be the most general available and acceptable in any given set of conditions facing a financial intermediary. If the inflationary economy is so constituted that in spite of all efforts a workable index-linking system comprises numerous indices, the government should ensure that particular intermediaries or areas of funds are not deprived while others benefit, and that healthy development of the capital market remains possible. This may require selective subsidization efforts to improve the compilation and coverage of indices, and flexibility in the use of index-linking will certainly produce fewer distortions than it eliminates, and its benefits will be immense.

73. The following indices are commonly proposed or used for value-linking.

- **Gold or Foreign Exchange Index**

74. This index has been used in some Latin American countries and Israel, with mixed success. It possesses the great advantages of simplicity and freedom of index computation problems, and, if left free to adjust to market forces, provides a reasonable approximation to the fall in the purchasing power of the domestic currency. Problems arise when it is subjected to government control and to speculative pressures. If devaluations are periodic and the increments large, the foreign exchange rate can be a very misleading index of value, particularly if it is subjected to large fluctuations because

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1/ See David Finch, *loc. cit.*, page 21, who specifically recommends the use of a standardized index for loan adjustment. He does not, however, consider the problems arising from the inapplicability or lack of a general index.

2/ Israeli experience has been particularly unhappy, and after the large devaluation in 1962 this index was dropped for value-linking purposes. See Please, and Morag, *loc. cit.* Israeli problems arose more from the large jump in the exchange rate than anything else; a steady depreciation might have worked quite well.
of "hot money" movements. In countries which have adopted the system of more or less constant depreciation in line with inflation, it may serve as a useful index as long as speculation is kept well in hand. It may also prove more acceptable than other indices, particularly in cities, because people have become used to holding part or all of their savings in foreign currency. For the same reason it may appear rather remote to rural savers and borrowers, though in actual fact the exchange rate may be more sensitive to agricultural price changes than industrial ones if the country's exports are predominantly agricultural.

**Specific Price Index**

75. Another simple and easily monitored index is the price of the specific commodity produced by the borrower. It has been used in France with some success, and some Latin American countries are also experimenting with it. Economically it is hard to justify the choice of this sort of index to equitably serve both parties to the transaction, unless, as is very unlikely, the particular price chosen accurately reflects the rise in the general price level, i.e., coincides with the "average" price. However, in practice, it is likely to prove the most acceptable index to borrowers, especially those whose selling prices tend either to fluctuate more widely than others or to decline consistently in real terms. There is some reason to argue that borrowers whose incomes are subject to unpredictable and large fluctuations should have their debts adjusted to match their incomes. In the long run neither borrower nor lender is likely to gain at the expense of the other, and the borrower will certainly find it more convenient to meet his obligations.

76. When the borrower's selling price declines constantly in real terms, however, it is difficult to see why the burden of his debt should be reduced accordingly to the detriment of the lender. If the decline is due to controls imposed by the government as is common with agricultural production, the saver is in effect forced to subsidize the ultimate purchaser of the product. This form of subsidy is harmful to investment and resource allocation, and, what is more, does little to encourage the production of the commodity under price control. By cheapening agricultural credit, for example, while imposing price controls on foodstuffs, the government will discourage agricultural production on the one hand, and encourage the inefficient use of credit by farmers on the other. The correct policy would be to let the farmers bear the full burden of their debts in real terms but remove price controls or subsidize their incomes directly.

77. If the price decline for the specific commodity is due not to government controls but to changes in market conditions, there is no reason why the producer should get credit cheaper than under stable price conditions;

1/ If there is no other form of indexing available in the economy, it may also prove quite attractive to lenders, because any form of value adjustment to inflation will probably draw forth substantial savings in monetary form. Whether or not it is the most effective index for increasing such savings is a different problem.
he should be reducing or stopping the production of that commodity, and credit should be switched to commodities in greater demand. This point is worth remembering because the use of the individual price index can in these cases lead to very undesirable results, in spite of its other attractions. The use of such indices will also be impractical on a large scale, because it would involve hundreds of different standards of value adjustment.

78. The use of the specific price index may nevertheless be recommended in those cases where more general indices are not available or reliable, and where such an index is not specifically used as a subsidy to the borrower. Thus in rural areas it may be the only acceptable index for value-linking, at least initially; it could be easily checked by both parties and, assuming no government interference with prices, would not be liable to deliberate distortion one way or the other.

79. Many variations on this theme are also possible. A composite index of different kinds of agricultural prices could be used; a profit-sharing arrangement could be introduced so that the lender enjoyed some of the benefits of equity-type investment; the index could be periodically revised and extended until a realistic general index of prices in rural areas was built up, etc. As a practical technique it has much to recommend it.1/

Wage Index

80. A wage index is the counterpart to the specific price index on the savers' side. It adjusts the value of loans to the real income of most small savers, and is likely to prove most acceptable to them as a value-linking device. The wage index, especially in urban areas where unions are strong and wages are adjusted constantly to the rising cost of living, can generally be a good indicator of the rate of inflation. It has two defects. First, the adjustment of money wages to inflation may be affected by political and fortuitous factors (rises in productivity, strength of union leaders, form of linkage to cost of living, etc.), and may at times give a misleading indication of the value of money. Second, wages may lag behind the rise in the cost of living by up to a year. When inflation is accelerating, a wage index favors borrowers against lenders; in periods when inflation is decelerating, real wages lead prices, and the index favors lenders against borrowers. In practice, these are not very serious defects, and a savings-and-loan scheme in Chile has been using this index among others with great success.

81. The main limitation of the wage index is that it is not relevant outside industrial and urban areas, or even within industrial areas that do not have organized trade unions. Wages which are adjusted haphazardly to inflation cannot serve as guides to value adjustment.

General, Cost-of-Living or Wholesale Price Index

82. For the purpose of index-linking, any of these indices would be appropriate if they were accurate, unbiased and generally available. They are the closest approximations we can get of the ideal index. Unfortunately,

1/ A small practical advantage of the specific price index is that it is always available, while more general indices are published annually or semi-annually after considerable lags.
the indices that actually exist are usually limited in coverage, sometimes inaccurate, and suspected of bias. The cost-of-living index, compiled only for the largest cities, is heavily influenced by controlled prices on such items as rent, public utility tariffs and some foodstuffs and understates the true extent of inflation. The wholesale price index, which would reflect more closely the prices affecting the borrower, does not give an accurate picture of the value of money to the saver. The general price index faces even thornier weighting problems and is undependable in most highly inflationary countries.

Putting Index into Practice

83. All general indices of prices are open to criticisms, true or false, of "rigging" bias, and inaccuracy, which may reduce their acceptability. One of the biggest problems in the introduction of index-linking is to get a wide section of the population concerned to accept its honesty and usefulness; these problems can be greater for general than for specific indices. Brazil faces the problem of having a multiplicity of indices which give quite different results, none of which is entirely acceptable, but still those indices which prove acceptable are used in the area of its coverage (chiefly Sao Paulo and Rio). Chile has included the cost-of-living index as one of the value adjusters in its successful savings-and-loan scheme, and Israel and Finland have also had happy results from this index.

84. In general, however, even the cost-of-living index cannot have a wide application in inflationary underdeveloped countries. It may be used in the very largest cities, but even there it is possible that people would prefer a foreign exchange index or a wage index. In the long run it would, of course, be best to use a general index, but that may have to wait until the idea of linking has become commonly accepted and index compilation has improved. In all non-urban areas, the only practicable indices may be specific price indices or the foreign exchange index.

85. No index is thus completely satisfactory, and all the qualifications mentioned above must be borne in mind in applying them. It is clear that the government will have to take the initiative in introducing value-linking, and to do this on a sufficiently wide scale it may have to go to a great deal of trouble and expense. A promotional campaign may be required to pave the way, and subsidies may be needed if different indices give differing results, or if savers and borrowers with an intermediary have to be compensated by different indices. In some cases borrowers may have to be charged less than full adjustment to overcome their initial misgivings or to compensate for the extra riskiness involved in investing in commodities that have particularly erratic prices.

86. It is evident, however, that some form of index-linking is necessary for the success of financial intermediaries under high inflation. No other policy short of stopping inflation creates conditions under which they can begin to operate. The potential benefits of index-linking on a broad scale are immense, and are likely to far outweigh any distortions that the choice of indices causes.
87. Is it plausible that investors, particularly in the industrial sector which has been managing for a long time without financial intermediaries, will accept and use indexed loans? Such loans will involve a real cost to them much higher than commercial bank loans or self-financing, the only domestic sources of finance. There are many reasons why they should accept, even welcome, indexed loans from newly-established financial intermediaries: it will open up an entirely new source of long-term institutional finance which does not exist in highly inflationary economies; if the rate of interest charged is reasonable, the funds can be used productively to yield high profits; the real cost of borrowing outside commercial banks is very high; capital raised externally is perhaps more difficult to negotiate and in effect is equivalent to a loan tied to the foreign-exchange index. If the intermediary also undertakes promotional work such as the dissemination of new techniques, research, project appraisal and the like, investors will gain immensely from their assistance.

C. Summary

88. In summary, a high and persistent inflation creates conditions and attitudes detrimental to the founding of financial intermediaries like development banks, agricultural credit banks, and building societies. These conditions cannot be adequately combatted by raising interest rates or subsidizing intermediaries. The best solution seems to be the tying of all debts to some index of inflation to maintain their value in real terms. There is no single index which can ideally serve the whole economy, and perhaps many different kinds of indices will have to be used, at the cost of some confusion and distortion in the credit market. However, the benefits of even this sort of imperfect system are immense in terms of increased monetary saving, better allocation of resources, and the fostering of long-term financial contracts. The main initiative would probably have to come from the government, since initially a great deal of trouble and expense may be required. The limited experience with index-linking in highly inflationary economies does, however, indicate that the results are worth the trouble.
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