

Investment decisions and financial management in an inflationary economy

INTRODUCTION

A high rate of inflation has become a prevalent phenomenon both in developing and developed countries. Many countries in today's world are paying the price of a double-digit inflation rate to maintain a relatively high level of employment and for more pronounced government involvement in the economy. Inflation has far reaching effects on many social, political and macro-economic aspects of our lives. In this article the question of the real effects of inflation on investment decisions and on corporate financial management is raised.

Indeed, it is argued that inflation does have a real effect on investment decisions and on the day-to-day financing decisions of almost any firm.

In the second section of the article the issue of inflation and government involvement in the economy is briefly discussed. The real effect of inflation on investment decisions in different industries is analysed in section three. Tax policy and capital subsidies are examined in the fourth section. The fifth and concluding section deals with financing decisions and other implications of inflation on financial management.

INFLATION AND GOVERNMENT INVOLVEMENT IN THE ECONOMY

Sustained inflation, and particularly high inflation are dependent on government policy. Initial government intervention which causes inflation will in turn lead to greater involvement to compensate for the damage which resulted from the initial inflation.

Two types of inflation are discussed in the economic literature: 'demand-pull' inflation; and 'cost-push' inflation.

In the first type, the government steps in to finance a budget deficit either by 'printing money' or by expanding domestic credit. The increase in the money supply causes a rise in prices and triggers the inflationary process.

In the second instance, the inflationary process is spurred by a rise on the cost side of the economy, e.g. new taxes such as a general sales tax; an increase in wages and salaries; or an exogenous increase in the cost of imported goods such as oil. The continuation of this 'cost-push' inflation depends on government reaction to this initial rise in the cost of doing business. The inflation will persist if the government responds to pressure by increasing the money supply.

As indicated in the above examples, an increase in the money supply is a necessary condition for inflation. As the government, through its monetary authorities, is the only agency controlling credit and currency in circulation, it bears the ultimate responsibility for inflation.

The inflationary process affects the income distribution of consumers, industries, and firms alike. In an effort to seek compensation for any reduction in their real

income, both consumers and firms approach the government. In Israel, cost-of-living clauses in wage contracts as well as subsidised long-term development loans for industry are two examples of such compensatory arrangements. Obviously, general uniform compensatory arrangements create problems as they may overcompensate some economic units and undercompensate others. In this way, the government is increasingly drawn into involvement in the economy because of inflation.

THE REAL EFFECTS OF INFLATION AND INVESTMENT DECISIONS

The real effect of inflation on investment decisions in the corporate sector lies in the uneven distribution of changes in the input and output prices for a given rate of inflation. In other words, inflation is measured by an index; most often the Consumer Price Index (CPI), a weighted average of many items. Were all prices to change in a uniform fashion, the use of this general index would be appropriate. However, various industries and economic activities respond in different ways to the same change in the money supply. What is relevant for the investor and for the manager is to what extent output and input prices are affected by a given rate of change in the CPI, and what is even more important, how the ratio between output prices and input prices has changed as a result of inflation. This last ratio is the 'terms of trade' of the particular activity vis-à-vis the economy at large.

The extent to which the same rate of inflation affects different industries is illustrated in Table 1 below.

Table 1
Monthly changes in the price indices in Israel

February to March 1978
(% per month)

CPI	+3,7	Metal products	+1,5
Industrial WPI	+3,3	Minerals	+5,9
Chemicals	+5,0	Electric equipment	+4,2
Food	+0,8	Plastics	+5,0
Basic metal	+3,7	Building materials	+2,4

The change in the profitability of a given real investment as a result of inflation depends on the expected change in the 'terms of trade' of the activity. Those economic activities where the 'terms of trade' improve with inflation (i.e. the change in the prices of their inputs is smaller than the change in their output prices for the same change in the CPI), will be more profitable the higher the inflation. Those economic activities where the 'terms of trade' deteriorate with inflation will be less profitable.

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Thus, investment decisions and real profitability are not independent of the inflation rate. Moreover, as a high rate of inflation persists, it may affect the nature of investment as investors will be attracted to those investment projects where the 'terms of trade' improve with inflation.

TAX POLICY AND CAPITAL SUBSIDIES

In the previous section, the real effects of inflation on investment decisions were examined under conditions of no taxes and subsidies. However, governments do levy taxes and most do subsidise some industrial investment activities as well. In this section the combination of taxes, subsidies and inflation is discussed. Taxes are levied on the basis of historical cost and current income. In a state of high inflation, a substantial proportion of income is not real income, yet it is subject to tax. Given an inflation rate of 40% and a corporate tax rate of 65% (which are the current Israeli conditions), an all equity firm (i.e. an unlevered firm) must earn 114% per annum in order that its capital remain intact in real terms. The high rate of return required is a result of the following process: If the inflation rate is 40%, the firm must earn 40% in order to compensate the shareholders for the higher prices in the economy. The government, however, treats this compensatory income as regular, fully taxable income. Therefore, every pound of income before taxes is actually worth one pound minus the tax. In other words, the real rate of tax (adjusted to inflation) is higher than the nominal tax rate.

The relationship between the tax rate, the rate of inflation and the required rate of nominal return which yields a zero rate of real return is presented in Table 2 below.

Table 2
The relation between tax rate, the rate of inflation and the required zero return

Rate of inflation (%)	Tax rate (%)			
	40	50	60	65
10	17	20	25	28.5
20	33	40	50	57
30	50	60	75	85
40	67	80	100	114

One way to counteract this effect and to ensure a higher rate of return on the equity of the firm (ROE) is by using financial leverage. Financial leverage, or the introduction of borrowed capital to the firm, increases the return on equity because of the preferential tax treatment accorded to interest payments. Whereas dividends to shareholders are not considered an expense for tax purposes, interest payments to bondholders are deducted from taxable revenues of the firm. As a result, firms do tend to utilise debt, or use leverage. The extent of the leverage is an increasing function of the tax rate, and a decreasing function of the cost of bankruptcy. As was shown above inflation increases the real tax rate and thus, ceteris paribus, increases the use of financial leverage in the corporate sector.

In many countries, developed and developing alike, the government assists industrial enterprises by giving subsidised loans at nominally fixed interest rates. The

subsidy is created by fixing an interest rate below the expected rate of inflation. Thus the borrower receives a subsidy which is equal to the present value of the difference between the stream of his payments and the stream of payments calculated at the market rate of interest, a rate which reflects the expected rate of inflation.

These subsidies can be quite substantial. In Israel the government provides certain enterprises with up to 35 per cent of their fixed assets as a grant and an additional long-term loan on 40 per cent of their fixed assets at an interest rate of 22 per cent. (The current rate of inflation in Israel is about 40 per cent per annum.) Obviously once the loan is granted and the inflation rate rises, the subsidy is also increased.

The capital subsidy affects both investment and financing decisions. Given that the subsidy can be realised only by borrowing, it is not surprising to find that every enterprise attempts to maximise the subsidy by borrowing as much as possible from the government. What may be less apparent is the fact that the capital subsidy plus the tax policy tilts the risk structure making the investor less risk averse and penalising the successful entrepreneur. To illustrate this point, let us assume that two investors are initiating two identical enterprises. Given the capital subsidy, their equity position is smaller than what it would be without this policy. Let us assume further that one enterprise is a success and that the other one fails. The loss of equity for the bankrupt enterprise is smaller due to the capital subsidy. The loss will be smaller (and the subsidy larger) as the rate of inflation is higher. The successful enterprise will begin paying taxes which will increase with the rate of inflation. Thus it will 'repay' the government for the initial subsidy. Thus, inflation reduces both the relative cost of failure and the reward of success.

FINANCIAL MANAGEMENT AND INFLATION

One characteristic of a high inflationary period is the appearance of debt instruments with variable interest rates and variable payment schemes. In Israel there exist three main types of debt instruments:

- (a) Debt instruments denominated in nominally fixed interest rates (e.g. overdraft facilities, short-term commercial loans).
- (b) Debt instruments linked to the consumer price index (CPI) (e.g. most long-term 'free market' loans, mortgages).
- (c) Foreign currency debt instruments (denominated mostly in U.S. dollars).

The third type of debt instrument has attained popularity in Israel since the relaxation of exchange controls in October 1977.

The variety of denominations presents the financial manager with the problem of how to choose from among the different debt instruments. Which is riskier than the others? Should the debt portfolio of the firm include only one type of debt instrument or a composition of several debt instruments with different denominations?

Given the debt/equity ratio of the firm, it can be shown that the decision depends on two variables. The first one is e_1 = the expected cost, in terms of nominal currency, of the interest payments. This cost is function of

inflation, either directly or indirectly, through the change in the exchange rate. The second variable is c = the covariance between the operating income of the firm and the variable rates. The solution depends on market variable (e_1) and on firm specific variable (c). The general nature of the set of possible solutions is presented in Table 3 below.

Table 3
The composition of optimal debt portfolio under different assumptions with regard to e_1 and C

		$e_1 = 0$	$e_1 > 0$	$e_1 < 0$
$C \leq 0$		Nominally fixed debt	Nominally fixed debt	Mixed solution
$C > 0$	$\frac{C}{b^2} \geq L$	$X = \frac{L}{1}$	Mixed solution	$X = \frac{L}{1}$
	$C < L$	$X = \frac{C}{1 \cdot b^2}$	Mixed solution	Mixed solution

X_1 = the proportion of the variable debt in the total debt