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Inflation and Investment Allowance

Introduction

AN important objective of the investment allowance had been to compensate for inflation and thereby enable the companies to replace their equipment. In fact, when the investment allowance was reintroduced in 1976, inflation compensation was the main motive. Generally companies are granted tax depreciation allowance at a rate varying between 15 and 30 per cent of the written-down cost of the capital equipment. Thus by the time a particular machine of a company went scrap, a company would have obtained a tax deduction equivalent to the cost of the machine. If the price of the machine did not change in the meantime, the machine could be replaced without any additional burden. However, in the face of inflation, the total depreciation allowance obtained would be inadequate to replace the machine. In the event, investment allowance is like an extra 25 per cent depreciation allowed in the first year.

In this chapter we shall examine to what extent the investment allowance supplemented the tax depreciation allowance and thereby compensated for inflation.

Methodology

Inflation affects the tax liability of corporations mainly in three ways: First, the value of the physical assets changes over time, thereby affecting the compensation of tax depreciation allowance. Second, the nominal value of the sales income changes over time. Third, inflation also affects the capital financing

patterns as the cost of internal funds might increase faster than the interest costs because of the administered interest rates, making debt-financing more attractive. [For a detailed discussion of the inflation effects, see Sen (1987).]

In our model of investment behaviour discussed in the earlier chapters, all these three effects of inflation on the investment decision have been taken care of by the rental cost of capital. Particularly it was shown that, the expected present value of life-time tax depreciation allowances per unit of capital would be lower in the face of inflation.

The fully inflation-adjusted tax compensation requires the following: Let p and q' be the rates of change in the general price level (say, wholesale prices) and in the machinery price level, respectively. Then the cost effectiveness of investment per unit (ignoring for the time being, the financing pattern and denoting u as an average effective tax rate on corporation income) would be

$$q = [c(1-u) + dq'u] \int e^{(q'-d-r-p)t} dt \quad (5.1)$$

which yields

$$c = q(r+d+p-q') \left[\frac{1-du/(r+d+p-q')}{1-u} \right] \quad (5.2)$$

The existing practice, however, is to compute sales income in current prices and depreciation allowances at constant prices, which makes the total tax depreciation allowances per unit of capital to be

$$d/(r+d+p). \quad (5.3)$$

The formula used in this study assumes that the rate of inflation in the machinery prices is the same as the general price rise (i.e., $p=q'$).

The shortfall in the tax depreciation allowances due to inflation can be computed as a difference between the hypothetical value of z when the tax depreciation is fully adjusted for inflation, and its actual value. In other words the shortfall

$$\Delta z = \frac{d}{d+r} - \frac{d}{d+r+p} = \frac{dp}{(d+r)(d+r+p)} \quad (5.4)$$

This shortfall Δz when compared with the investment allowance k would give an idea to what extent investment allowance compensated for the loss in the value of tax depreciation due to inflation.

The required compensation in the tax depreciation allowances, namely, Δz differs from company to company because, first, the effective rate of tax and the tax depreciation differ according to the type of company and type of machinery used as well as its intensity of use; and second, the discount rate differs. While some information is available on the discount rate, information on the effective tax depreciation is not available. In our regression analysis of investment behaviour in the earlier chapter, the best regressions are obtained when the effective tax depreciation rate is set to a constant 15 per cent.

Empirical Results

Aggregate analysis

For the present purpose Δz is computed for different values of d , namely 15, 20, 25, 30 and 35 per cent, for public limited and private limited companies separately, as well as by major industry groups of public limited companies.

The rate of investment allowance in general had been around 25 per cent. It can be observed that the required compensation for inflation in the tax depreciation allowances was much lower than the rate of investment allowance. For example, in the case of medium and large public limited companies, the average required rate of compensation per rupee of the capital stock ranged between 12 per cent and 15 per cent (Table 5.1). The compensation rate is slightly higher for private limited companies, ranging from 14 to 18 per cent. Thus one can see that the loss in the value of tax depreciation allowances is more than compensated by the investment allowance. The average compensation required for the private corporate sector was 13 to 16 per cent whereas investment allowance has always been above 20 per cent.

It also needs to be noted that during the four years 1978-79,

TABLE 5.1

**Required Per Unit Compensation for Inflation in the Tax
Depreciation Allowances—Public Limited Companies
(1976-77 to 1982-83)**

<i>Year</i>	<i>Rate of tax depreciation</i>				
	<i>0.15</i>	<i>0.20</i>	<i>0.25</i>	<i>0.30</i>	<i>0.35</i>
1976-77	0.05	0.20	0.25	0.04	0.04
1977-78	0.11	0.10	0.10	0.09	0.08
1978-79	0.15	0.15	0.15	0.14	0.14
1979-80	0.22	0.22	0.22	0.21	0.20
1980-81	0.22	0.22	0.22	0.21	0.21
1981-82	0.14	0.14	0.13	0.13	0.12
1982-83	0.05	0.05	0.05	0.04	0.04
Average	0.13	0.13	0.13	0.12	0.12

TABLE 5.2

**Required Per Unit Compensation for Inflation in the Tax
Depreciation Allowance—Private Limited Companies
(1976-77 to 1982-83)**

<i>Year</i>	<i>Rate of tax depreciation</i>				
	<i>0.15</i>	<i>0.20</i>	<i>0.25</i>	<i>0.30</i>	<i>0.35</i>
1976-77	0.05	0.05	0.04	0.04	0.04
1977-78	0.11	0.11	0.10	0.09	0.09
1978-79	0.15	0.15	0.15	0.14	0.14
1979-80	0.23	0.23	0.22	0.21	0.21
1980 81	0.24	0.25	0.23	0.22	0.22
1981-82	0.38	0.32	0.32	0.27	0.24
1982-83	0.15	0.12	0.12	0.10	0.07
Average	0.18	0.18	0.17	0.15	0.14

1979-80, 1980-81 and 1981-82, when the price rise was much steeper than in the earlier years, the required compensation in the tax depreciation was also relatively high. For public limited companies the compensation rate was around 18 per cent and for private limited companies it was between 20 and 25 per cent during these four years.

b. Industry-group-wise analysis

As mentioned earlier, the required compensation in the tax depreciation allowance for inflation differs among companies according to their effective rates of tax depreciation as well as the company-specific discount rate. Broadly speaking, companies belonging to same industry, however, can be expected to have the same type of equipment and same expectations regarding the minimum expected net rate of return. Therefore, one can expect that inter-industry variation in the compensation rate would be higher than the intra-industry rate. The extent to which the compensation differs between industries can be estimated for different industry-groups. This is attempted below.

The Reserve Bank of India's classification of industries into six major groups is considered for the purpose. These are: 1. Plantation, 2. Mining and quarrying industries, 3. Agro-based manufacturing industries, 4. Heavy manufacturing industries, 5. Other manufacturing industries, and 6. Other industries. The average required compensations for the seven years 1976-77 through 1982-83 at different effective depreciation rates are presented in Table 5.3. The table shows that the compensation required is higher for the heavy manufacturing industry category, closely followed by agro-based manufacturing, mining and quarrying and other manufacturing. Thus, by and large, the compensation required is higher for the manufacturing sector. This may be because of the relatively high minimum expected rate of return in these industries.

Summary

One of the primary objectives of reintroducing investment allowance was to compensate for the loss in the tax depreciation allowance due to inflation. A quantification of the required compensation has been attempted with a view to see how far

TABLE 5.3
Required Per Unit Compensation for Inflation in the Tax
Depreciation Allowance—by Major Industry-Groups
(Public Limited Companies)
Average for 1976-77 through 1982-83

<i>Industry group</i>	<i>Rate of tax depreciation</i>				
	<i>0.15</i>	<i>0.20</i>	<i>0.25</i>	<i>0.30</i>	<i>0.35</i>
1. Plantations	0.10	0.10	0.10	0.10	0.09
2. Mining & quarrying	0.14	0.14	0.13	0.13	0.13
3. Agro-manufacturing	0.12	0.12	0.12	0.12	0.11
4. Heavy manufacturing	0.13	0.13	0.13	0.12	0.12
5. Other manufacturing	0.13	0.13	0.13	0.12	0.12
6. Other industries	0.12	0.12	0.12	0.11	0.11

the rate of investment allowance has compensated for inflation.

It is found that investment allowance granted at the rate of 25 per cent of the cost of machinery, has more than compensated for the loss due to inflation in the value of total expected tax deduction for depreciation. The required compensation was expected to be 13 to 16 per cent at the effective depreciation rate ranging between 15 per cent and 35 per cent. For public limited companies the rate was around 12 to 13 per cent, while for the private limited companies it was 13 to 16 per cent. Further, for the four years, 1978-79 through 1981-82, when the price rise was much steeper than earlier years, the compensation required also went up. Even then, the required compensation was much lower than the existing rate of investment allowance.