V. FISCAL AND MONETARY POLICY AND THE RATIO OF EQUITY TO DEBT FINANCE

1. Introduction

The analyses in chapters II and IV identified depreciation, borrowings, retained profits and fresh issue of share capital as the major sources of financing corporate investment in India. Except for depreciation, the others can, *a priori*, be considered to be affected by changes in fiscal and monetary policies[13]. While borrowings (long-term) are generally referred to as "debt finance", the sum of retained profits and fresh share capital constitutes "equity finance". We now turn to an econometric analysis of the factors determining the relative proportions of corporate investment financed by these two methods of financing.

Econometric studies on the determinants of the pattern of corporate finance in India have generally concentrated on such determinants as the availability of funds from alternative sources, the level of investment expenditure and the risk-factor represented either by the stock of debt or by the debt-equity ratio. The effects of fiscal and monetary policies were largely overlooked. In actual corporate operations, however, factors like discriminatory tax treatment of borrowed and owned funds, cost and availability of loanable funds and direct controls in the capital market, such as credit rationing, could be expected to have a close bearing on the pattern of financing corporate investment. Accordingly, we analysed the determinants of the pattern of financing corporate investment, paying special attention to those determinants which come under the purview of fiscal and monetary policies. More specifically, we concentrated on the effects of fiscal and monetary policies on

[13]Depreciation is the most important single source of corporate funds but we excluded depreciation from the econometric exercises as it is a statutory deduction allowable under the Income-tax Act and is not influenced by fiscal and monetary policies, unless the tax laws directly affect the depreciation base, method and/or rates.

one aspect of corporate finance, *viz.*, the ratio of equity to debt finance[14].

In section 2, we specify a model of the factors determining the ratio of equity to debt finance based partly on the recent theoretical developments in the theory of corporate finance and partly on the economic characteristics specific to the Indian capital market. Section 3 presents the principal conclusions that were derived from estimating alternative versions of this model using the company finances data published by the Reserve Bank of India on large and medium public limited companies for the period from 1956-57 to 1975-76. As a backdrop to the *a priori* model specification and econometric estimation exercises, it may not be out of place here to present the trend in the ratio of equity to debt finance.

Table V.1 presents the ratio of equity to debt finance for the large and medium public limited companies. The annual average of this ratio worked out to 1.54 for the 20-year period, 1956-57 to 1975-76. In two of the years during this period, namely, 1959-60 and 1972-73, the ratio was abnormally high, 5.54 in 1959-60 and 11.9 in 1972-73. These abnormal ratios created certain problems for the econometric exercise and hence they were excluded from the analysis.

It may be pointed out here that the equity to debt finance ratio presented in Table V.1 were based on the RBI data on companies which mainly included well established ones and might have also included some stagnating and loss making ones. If a study was made of the equity to debt ratios of only new companies, or for that matter, companies engaged in highly capital intensive activities, the ratio could have been higher than that depicted here.

No clear trend is visible in the long-run behaviour of the ratio. While upto the Third Plan period, the ratio was increasing (the average annual ratio were 0.70 and 0.87, respectively, during the Second and the Third Plan periods), it fell during the three years of the Annual Plans to 0.36, and then rose again to an average of 1.03 during the Fourth Plan period (excluding 1972-73); during the first two years of the Fifth Plan, the ratio fell to 0.50.

[14]The term equity to debt finance ratio is used to denote the ratio of two flows: the yearly changes in equity to the yearly changes in debt, whereas the term debt-equity ratio is used to denote the ratio of two stocks: the stock of debt to the stock of equity.

TABLE V.1

The Proportion of Equity to Debt Finance: Large and Medium Public Limited Companies 1956-57 to 1975-76

Year	Equity finance as a proportion of debt finance
1956-57	0.5333
1957-58	0.4226
1958-59	0.7607
1959-60	5.5370
1960-61	1.0984
1961-62	1.3435
1962-63	0.8171
1963-64	0.9119
1964-65	0.7291
1965-66	0.5335
1966-67	0.0953
1967-68	0.2333
1968-69	0.7418
1969-70	1.0696
1970-71	0.8191
1971-72	1.2704
1972-73	11.8983
1973-74	0.9521
1974-75	0.7679
1975-76	0.2291

Sources: 1. Reserve Bank of India (1977). *Financial Statistics of Joint Stock Companies in India 1970-71 to 1974-75.*
2. Reserve Bank of India (1975). *Financial Statistics of Joint Stock Companies in India 1960-61 to 1970-71.*
3. Reserve Bank of India (1967). *Financial Statistics of Joint Stock Companies in India 1950-51 to 1962-63.*

2. The Model

In the theory of corporate finance, the determinants of the ratio of equity to debt finance in the capital structure of a firm have received a good deal of attention. Modigliani and Miller (1958) showed that in a perfect capital market, in the absence of risk (arising out of the possibility of firms going bankrupt) and of relative tax effects depending on the financial structure of firms (*i.e.*, the absence of differing tax treatment of company earnings according to whether these were paid out as interest on debt, or were paid out as dividends, or were retained in the firm), the cost of capital to the firm, and consequently, the market value of the firm,

is invariant to the structure of financing. The Modigliani-Miller proposition that under some quite general circumstances the structure of a company's capital should not affect the cost of capital was both stimulating and challenging. Subsequently, attention was turned to an analysis of the effects of the corporate tax system and of the risk arising out of the possibility of firms going bankrupt on the relative cost of equity versus debt financing of corporate investment. Based on these theoretical developments as well as on the economic characteristics specific to the Indian capital market, we selected the following variables as being the most important determinants of the ratio of equity to debt finance.

(*a*) *The Corporate Tax Rate*

A common feature of corporate tax systems in many countries, including India, is the deductibility of interest payments by companies against earnings for computing the corporate tax liability. In other words, the interest payable on corporate debt is excluded in computing the taxable profits. Other things remaining the same, the existence of such a corporate tax system makes debt finance more profitable to the firm than equity finance. Accordingly, one of the fiscal determinants of the ratio of equity to debt finance, as suggested by the Modigliani-Miller theorem, is the corporate tax rate. Put formally, the ratio of equity to debt finance becomes a negatively sloped function of the corporate tax rate because of the existence of tax regulations which permit deduction of interest payments by the firm against its earnings for tax purposes.

The corporate tax rate which we used in our empirical exercise is the effective corporate tax rate (defined as the ratio of tax provision to profits before tax). The effective corporate tax rate represents the corporate tax system better than the statutory tax rate, since the former takes into account the various deduction clauses, exemption limits and the rebate structure.

(*b*) *The Debt-Equity Ratio*

Under a corporate tax system in which interest payments are tax deductible, the optimal financial policy for a firm may appear to be one which would finance the entire investment by debt. However, in actual practice, corporate units do not follow such an extreme

financial policy due to the possibility of the risk of bankruptcy. As enunciated by Kalecki (1937), the marginal risk of bankruptcy increases with every increase in the debt of a firm in relation to its equity. In turn, the increased risk of bankruptcy leads to a higher 'capitalisation rate' (at which a firm's expected net profit stream is discounted) and, consequently, to a fall in its 'market value'; this fall in the market value of the firm represents the cost of bankruptcy arising out of the increasing debt-equity ratio. The existence of such bankruptcy costs makes it non-optimal for a firm to have only debt in its capital structure. In other words, the debt-equity ratio itself becomes an important determinant of the ratio of equity to debt finance.

In our exercises, we used one-year lagged debt to equity ratio (including both long-term and short-term debt) as an explanatory variable. *A priori*, we expect the sign of this variable to be positive.

(*c*) *Interest Cost of Credit*

The relative cost of equity versus debt finance may also be influenced by the rate of interest at which companies can borrow from the capital market. In the Indian capital market, the major lending agencies, as brought out in chapter II, are the commercial banks and the financial institutions like the Industrial Development Bank of India (IDBI), Industrial Credit and Investment Corporation of India (ICICI), Industrial Finance Corporation of India (IFCI), State Financial Corporations (SFCs) and Unit Trust of India (UTI). An increase in the interest rate at which companies can borrow from these financial intermediaries would raise the cost of debt finance relative to equity finance and, consequently, the ratio of equity to debt finance may also rise.

Three proxies for the cost of credit were used, namely, the simple bank rate, the weighted bank rate and the weighted advance rate of the commercial banks.

(*d*) *Direct Quantity-Controls in the Capital Market*

It is sometimes argued that in India corporate financial policy is affected more by direct controls such as credit rationing than by the interest cost of credit. One possible reason for such a behaviour on the part of firms is the persistent inflationary tendencies that have prevailed during the last two decades. In an inflationary economy,

the 'administered' interest rates may not represent the real cost of credit since these rates do not adjust fully to changes in the expected rate of inflation. Consequently, these rates are substantially below the 'equilibrium rates' thus leading to a persistent excess demand in the credit market. In such a market, it is only natural that direct 'quantity-controls' are more effective than variations in the interest-cost of credit.

The proxy for direct controls in the capital market which we used in our regression equations is the total credit sanctioned by the financial institutions (namely, the IDBI, ICICI, IFCI, SFCs and UTI) plus the commercial bank credit to the private sector.

(*e*) *Growth-Rate of Industrial Production*

The growth rate of industrial production could affect the ratio of equity to debt finance in two ways:

(*i*) As the growth-rate of industrial production is an important indicator of the performance of the corporate sector, changes in it may have a positive effect on the expected rate of profit. This, in turn, would have a positive effect on the demand for fresh shares; consequently, the value of fresh shares would go up in the equity market.

(*ii*) A higher-growth-rate of industrial production would also mean higher profits in the corporate sector. Given that the propensity of firms to save (*i.e.*, to retain profits) is positive, this would increase the amount of retained profits.

The growth-rate of industrial production would thus have a positive effect on the ratio of equity to debt finance. Accordingly, we incorporated in our empirical exercise the rate of growth of the index of industrial production (base year 1970 = 100) as an explanatory variable.

3. The Equations and Their Interpretation

We estimated alternative versions of the model of equity to debt finance using the data for the period from 1956-57 to 1976-77. None of the regression equations yielded meaningful results. As indicated in section 1, the sample period included two years in which the ratio of equity to debt finance rose abnormally. It is possible

that the inclusion of these two abnormal years in the sample was the main reason for such meaningless regression results. However, no particular economic factor could be identified as the cause of this abnormal increase in the ratio in these two years. Hence, we dropped the two years, *i.e.*, 1959-60 and 1972-73, from the sample period and re-estimated the equations. Some of these regression equations are presented in Table V.2. The dependent variable in all the regression equations is the ratio of equity to debt finance (EF/DF).

The first three equations of Table V.2 represent one version of our model of equity to debt finance — the version where only the interest cost of credit was the explanatory variable. The three interest rates mentioned in section 2, the simple bank rate (SBR), the weighted bank rate (WBR) and the weighted advance rate of the commercial banks (WCR) are tried one by one in these equations. It is interesting to note that none of the interest rates has a significant coefficient in these equations; what is more important, contrary to *a priori* expectations, all the three interest rates come out with negative coefficients. The DW statistic also points to positive autocorrelation of the regression residuals.

Equations from (4) to (6) include, in addition to the three interest rates, the one-period lagged debt-equity ratio $(D/E)_{t-1}$ as an explanatory variable. As explained in Section 2, this variable is a proxy for the risk factor and, *a priori*, the sign of its coefficient should be positive. Once again, none of the other variables come out with significant coefficients in these equations. However, the coefficient of the debt-equity ratio has the expected sign. The coefficients of the interest rates, although insignificant, still bear wrong signs. These results seem to indicate that the cost of credit does not have a significant impact on the ratio of equity to debt finance. Accordingly, in equation (7) we drop the interest rates and instead include the chosen proxy for direct quantity control in the capital market, *viz.*, the total credit sanctioned by the financial institutions (including the commercial banks) to the private sector (TC). Although the coefficient of this variable has the expected sign, it is not statistically significant. Neither the R^2 nor the DW statistic in equation (7) is better than in the preceeding equation.

In Table V.3 are presented the regression results of re-estimating some of the equations in Table V.2 after including the effective corporate tax rate (ECTR). The first interesting feature of these

TABLE V.2

The Ratio of Equity to Debt Finance: Regression Results with Interest Rates, Total Credit and the Debt-Equity Ratio as the Explanatory Variables

Equation No.	Constant	SBR	WBR	WCR	TC	$(D/E)_{t-1}$	R^2	F. value	D.W. Statistic
1	0.9457 (3.3072)***	—0.0375 (0.7504)					0.034	0.906	0.563
2	0.9243 (3.6648)***		—0.0302 (0.7725)				0.036	0.905	0.597
3	0.9559 (3.4372)***			—0.0263 (0.8122)			0.400	0.911	0.660
4	0.7287 (1.9437)**	—0.0807 (1.1627)				0.6037 (0.9027)	0.084	0.913	0.686
5	0.7267 (1.9202)**		—0.0503 (1.0309)			0.4256 (0.7098)	0.067	0.911	0.541
6	0.6673 (1.8250)**			—0.0714 (1.4438)*		0.8774 (1.1948)	0.123	0.913	1.052
7	0.4595 (1.1205)				—0.0002 (1.2964)	0.5331 (0.8898)	0.102	0.895	0.851

Note : (*i*) The figures in brackets are t-values.
(*ii*) ***, ** and * denote that the regression coefficient is significant at 1 per cent, 5 per cent and 10 per cent levels, respectively.

TABLE V.3

The Ratio of Equity to Debt Finance : Regression Results with Interest Rates, Total Credit, Debt-Equity Ratio and the Effective Corporate Tax Rate as the Explanatory Variables

Equation No.	Constant	SBR	WBR	WCR	TC	$(D/E)_{t-1}$	ECTR	R^2	F-value	D.W. Statistic
8	2.6952	—0.0120				0.3781	—0.0453	0.330	2.297	0.899
	(2.9021)***	(0.1752)				(0.6298)	(2.2672)**			
9	2.7960		0.0047			0.2777	—0.0478	0.329	2.286	0.936
	(2.9547)***		(0.0959)			(0.5238)	(2.3355)**			
10	2.6363			—0.0124		0.4338	—0.0422	0.331	2.309	0.892
	(2.6360)***			(0.2352)		(0.6223)	(2.0860)**			
11	2.7134				—0.00001	0.3270	—0.0462	0.329	2.284	0.912
	(2.4671)**				(0.0645)	(0.6007)	(2.1739)**			

Note : (*i*) The figures in brackets are t-values.
(*ii*) ***, ** and * denote that the regression coefficient is significant at 1 per cent, 5 per cent and 10 per cent levels, respectively.

equations is that the coefficient of the corporate tax rate not only has the expected sign but also is statistically significant at the 5 per cent level. Secondly, the inclusion of the effective corporate tax rate enhances the explanatory power of these equations as is evident from the consistently higher R^2 of equations in Table V.3 than those of the equations in Table V.2; however, the F-values still continue to be below their respective Table-values at the 5 per cent level of significance. Thirdly, once again the coefficients of the interest rates, the total credit and the one-year lagged debt-equity ratio show no signs of improving in statistical significance. Moreover, the D.W. statistics in Table V.3 indicate that the residuals are positively autocorrelated. In section 2, we hypothesised that the growth rate of industrial production would have a positive effect on the ratio of equity to debt finance. It is possible that the positive autocorrelation of the residuals in equations from (8) to (11) is due to the omission of this variable. Accordingly, we re-estimated equations from (8) to (11) by including the rate of growth of industrial production (IND). The results of this exercise are presented in Table V.4.

It is revealing to note from equations (12) to (15) that the inclusion of the rate of growth of industrial production pushes the values of the D.W. statistic upto the inconclusive range. Secondly, the coefficient of the rate of growth of industrial production itself is highly significant with the expected sign. Thirdly, the inclusion of the rate of growth of industrial production enhances the statistical significance of the coefficients of the effective corporate tax rate and the one-year lagged debt-equity ratio. Fourthly, the incorporation of the growth-rate of industrial production as an additional explanatory variable leads to an appreciable increase in the explanatory power of these equations. The R^2s of equations from (12) to (15) are approximately two times the R^2s of equations from (8) to (11). The F-values which were, hitherto, below their respective Table-values are now above them. All these improvements in the test-statistics suggest that the equations from (12) to (15) are certainly better than their counterparts in Table V.3. However, the coefficients of the monetary policy variables, *viz.*, the interest rates and the credit sanctioned by the financial institutions are still statistically insignificant, indicating that neither the 'cost' nor the 'availability' of credit affect the ratio of equity to debt finance. This is further supported by equation (16) in Table V.4 in which we drop the chosen proxies for the

TABLE V.4.

The Ratio of Equity to Debt Finance : Regression Results with Interest Rates, Total Credit, Debt Equity Ratio, Effective Corporate Tax Rate and the Rate of Growth of Industrial Production as Explanatory Variables

Equation No.	Constant	SBR	WBR	WCR	TC	$(D/E)_{t-1}$	ECTR	IND	R^2	F-value	D.W. Statistic
12	1.8753	0.0241				0.7433	—0.0453	0.0618	0.610	5.084	1.445
	(2.3962)**	(0.4337)				(1.5169)*	(2.8614)***	(3.0562)**			
13	1.9272		0.0209			0.7563	—0.0464	0.0614	0.613	5.147	1.491
	(2.4182)**		(0.5368)			(1.6972)*	(2.8759)***	(3.0894)***			
14	1.7806			0.00001		0.8695	—0.0423	0.0599	0.604	4.965	1.328
	(2.1006)**			(0.0010)		(1.5122)*	(2.5009)**	(2.9972)***			
15	1.7922				0.00001	0.8643	—0.0425	0.0600	0.604	4.965	1.333
	(1.9313)				(0.0223)	(1.8429)**	(2.5084)**	(3.0107)***			
16	1.7802					0.8699	—0.0423	0.0599	0.604	7.129	1.328
	(2.4414)**					(2.2762)**	(3.0549)***	(3.1254)***			

Note : (*i*) The figures in the brackets are t-values.
(*ii*) ***, ** and * denote that the regression coefficient is significant at 1 per cent, 5 per cent and 10 per cent levels, respectively.

cost and availability of credit. The exclusion of these variables results in an appreciable increase in the F-value. Moreover, the statistical significance of the coefficients of the corporate tax rate, the rate of growth of industrial production and the one-year lagged debt-equity ratio is also enhanced by the exclusion of the monetary policy variables. We are thus inclined to select quation (16) as the most preferred specification of the factors affecting the ratio of equity to debt finance. However, this should not be taken to mean that the role of monetary policy variables such as the 'cost' and 'availability' of credit is settled once and for all, because we experimented with only a few rates of interest from among the wide spectrum of interest rates that exist in the economy. The use of other indicators of variations in monetary policy may help to settle the question of the role of monetary policy in the determination of corporate financial policy. This, however, is a matter for further research.

4. Major conclusions

Based on the interpretation of the results examined in section 3, we give below the major conclusions derived from our empirical exercise.

First, the effective corporate tax rate is found to be an important factor determining the yearly variations in the ratio of equity to debt finance. We hypothesised in section 2 that because of the deductibility of interest payments by companies against earnings for computing corporate tax liability, the corporate tax rate would have a negative effect on the ratio of equity to debt finance. This often-held hypothesis in the theory of corporate finance is, by and large, found to be supported by our econometric results. This result is of added importance in view of the fact that most of the earlier studies on the pattern of corporate finance in India generally neglected the role of this fiscal variable.

The magnitude of the effect of a change in the effective corporate tax rate on the ratio of equity to debt finance is quite high. Our results indicate (equation 16) that for every one percentage increase (decrease) in the effective corporate tax rate, the ratio of equity to debt finance falls (increases) by 2.7 per cent. Although this estimate of the effect is subject to a margin of error, the finding has important policy implications. It is generally agreed that one of the objectives of fiscal policy is to promote a 'desirable' balance

between the two major sources of financing corporate investment, *viz.*, equity and debt. Our econometric result suggests that the effective corporate tax rate can be a potent fiscal instrument to attain this objective, given the present base of the corporate profits tax.

Secondly, the one-year lagged debt-equity ratio appears to have a significant positive effect on the ratio of equity to debt finance thus supporting yet another often-held hypothesis in the theory of corporate finance that there are significant 'bankruptcy costs' associated with the temporal increases in the debt-equity ratio of a firm. From the point of view of the corporate unit, the existence of such 'bankruptcy costs' offsets a part of the gain from debt-financing of investment that accrues on account of the interest-deductibility feature of the corporate tax system.

The elasticity of the ratio of equity to debt finance with respect to the one-year lagged debt-equity ratio is 0.88. In other words, for every one per cent increase (decrease) in the debt-equity ratio, the ratio of equity to debt finance increases (decreases) by 0.88 per cent. This finding is of special interest since almost all the earlier studies on the effect of debt-equity ratio on the corporate financial policy in India have generally found this variable to be statistically insignificant.

Thirdly, our empirical results would suggest that the variations in the rate of growth of industrial production have a significant positive effect on the ratio of equity to debt finance. This is evident from the fact that in all our regression equations (in which it is included) this variable is statistically significant with a positive sign. Going beyond our regression equations, it is discernible that the sudden fall in the ratio of equity to debt finance took place in the two years 1966-67 and 1967-68 during which there was an unprecedented fall in the rate of growth of industrial production.

In terms of the magnitude of the effect of the growth of industrial production, our results indicate that, on the average, every one per cent increase (decrease) in the rate of growth of industrial production causes the ratio of equity to debt finance to rise (fall) by around 0.45 per cent. This suggests that the ratio of equity to debt finance would be higher when the industrial economy is marching ahead than when it is sluggish.

Finally, regarding the effect of the monetary policy variables such as the 'cost' and 'availability' of credit, the empirical evidence

seems to be inconclusive. The main difficulty in the empirical estimation of the effect of these factors on the pattern of corporate finance lies in the choice of variables to represent them quantitatively. For example, in the case of interest cost of credit, the selection of a particular rate of interest from among the wide spectrum is always beset with problems; nor is it possible to take into account all the interest rates in any empirical exercise. The three interest rates which we included in our empirical exercise, however, turned out to be statistically insignificant. The quantification of the restrictiveness of monetary policy in terms of the 'availability' of credit is no less problematic than the selection of the 'right' interest rate in view of the fact that in India (as in many other countries) monetary policy operates through a complicated system of differential interest rates, selective credit controls and varying debt-equity norms. The proxy which we used for the 'availability' of credit, *viz.*, the aggregate credit sanctioned by the financial institutions (including the banks) to the private sector, however, came out with a statistically insignificant coefficient. Considered against this background, we are inclined to conclude that the quantification of the effects of the monetary policy variables on the ratio of equity to debt finance is largely an unsettled issue that needs more rigorous and further research.