TAXATION AND SAVING BEHAVIOUR OF PRIVATE CORPORATE SECTOR IN INDIA

Prpared by

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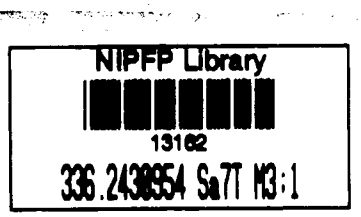

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I. INTRODUCTION

Private corporate sector has been looked upon as an important source of savings in India. In fact, most of the tax policies that are directed towards this sector have the implicit objective of raising its savings, the purpose being two-fold; to make the private corporations self-sufficient in meeting their investment needs and thus reduce competition for the public sector in the credit market. Important among the tax instruments are; abolition of grossing-up practice, adoption of 'Classical' type of income tax system, levy of additional dividend taxes and revision of personal income tax rate structure vis-a-vis the rate structure of capital gains tax. All these have led to an increasing tax discrimination in favour of profit retentions. Further, a portion of tax deductions resulting from availing of the investment incentive schemes have been made unavailable for distributions as dividends.

However, the contribution of corporate sector to domestic savings effort remains low. Over the last three decades its share in gross domestic savings has come down substantially from around 15 per cent in 1961-62 to 7.4 per cent in 1979-80. Also the rate of saving in terms of gross domestic product has hardly been 2 per cent (Table 1). The low contribution of private corporate sector to domestic savings could be

TABLE 1

Trends in Corporate Savings in India

Year	Gross savings (Rs crore)	Ratio to gross domestic saving	Ratio to GDP at market price
1950-51	89	9.1	0.9
1951-52	132	13.1	1.3
1952-53	60	7.4	0.6
1953-54	86	9.3	0.8
1954-55	114	10.8	1.2
1955-56	130	9.1	1.2
1956-57	151	9.4	1.3
1957-58	117	8.5	1.0
1958-59	136	9.7	1.0
1959-60	180	10.2	1.3
1960-61	276	13.4	1.8
1961-62	315	15.1	2.0
1962-63	338	13.6	2.0
1963-64	387	13.7	2.0
1964-65	381	12.1	1.7
1965-66	396	10.5	1.6
1966-67	414	9.2	1.5
1967-68	399	8.9	1.2
1968-69	427	9.1	1.3
1969-70	536	8.9	1.5
1970-71	657	9.7	1.6
1971-72	753	10.0	1.7
1972-73	788	10.1	1.6
1973-74	1062	9.3	1.8
1974-75	1441	11.4	2.1
1975-76	1055	7.1	1.4
1976-77	1161	6.6	1.4
1977-78	1385	7.1	1.5
1978-79	1544	6.6	1.6
1979-80	1744	7.4	1.6

Source: Report of the Working Group on Savings. Capital Formation and Savings in India 1950-51 to 1979-80. Government of India, Ministry of Planning, New Delhi, 1982, p. 164.

affecting corporate saving in required detail, are scanty at macro level. Therefore, for a detailed empirical analysis, data based on samples of corporations will be used. Reserve Bank of India (RBI) publishes aggregate time-series data on a sample of corporations based on their annual reports. The sample coverage is adequately large for drawing inferences regarding the corporate sector as a whole. However the RBI data, being published in the form of aggregate time-series, will not facilitate analysis of the impact of certain firm specific factors such as size, growth, and age, besides the actual tax liability. Therefore, recourse will be made to a sample of companies specially selected by us for the purpose, from the Bombay Stock Exchange Directory. Section III presents the empirical results of the time-series analysis based on RBI sample data as a preliminary testing of our hypotheses, as well as the results based on our sample, which, apart from providing a more scientific data base, will also facilitate cross-checking of the findings of the analysis based on the RBI data. Finally section IV summarises the main findings of the empirical analysis based on alternative sets of data.

II. THE MODEL

At the outset, we shall explain the term 'corporate savings' as used in this study and examine the basic motives of savings by private corporations. This will help to identify major determinents of savings. We shall rationalise the manner in which these factors affect savings, taking into account the possible interdependences between them. Of particular interest being the impact of taxes, we shall also examine how taxes affect the savings decision mechanism.

1. Interpretation and Motives of Corporate Savings

The term 'corporate savings' is used in this study to denote the sum of three items in the annual profits and loss accounts; (1) retained profits, (2) accounting depreciation provision, and, (3) provision for development rebate reserve (or investment allowance reserve). The entire depreciation provision is considered as a part of savings because of the difficulties involved in separating out the 'natural' part of depreciation, which is an expenditure item. The third component arises out of the various tax incentive schemes for encouraging investment. Under these incentive schemes a portion of the tax deductions claimed, is required to be put in a reserve to make it unavailable for distribution as dividends.

Basically, the capacity to save of a corporation in a given year is represented by its gross cash flow (gross profits - interest payments depreciation). The allocation of gross cash flow

between taxes, dividends and saving is guided more by choice rather than compulsion. This is because, firstly, a substantial part of savings is in the form of retained net profits which is due to voluntary restraints on distributions. Secondly, accounting depreciation practices vary (depending upon the method and rate) so much that, theoretically speaking, a corporation can choose a depreciation method that suits its saving preferences. The only element of compulsion to save could be due to the statutory restrictions on distributing the benefits of investment incentive schemes. But even in this case also, it can be argued that if a firm chooses to distribute a higher proportion of cashflow as dividends, it can do so by claiming less tax deductions under the investment incentive schemes.

For the purpose of our study, we shall consider retained profits and depreciation together (hereafter referred as 'retentions'), while we need to treat the third component of saving (hereafter referred as 'tax incentive saving') separately. However, we retain the term 'corporate savings' to denote the sum of the three items (or retentions + tax incentive savings).

Three main motives can be conceived for a corporation to save:

(i) <u>To finance new investment</u>. "Modern techniques of production require not only large initial capital but also necessitates continuing investment for modernisation and expansion as a price for remaining in business" (Parekh, 1958 . pp. 122). The investment is

financed mainly in three ways; (i) by floating new equity issues, (ii) by borrowings, and (iii) by profit retentions. In the absence of taxes and floating costs, a firm is indifferent between new equity and retained profits for financing new investment, (Modigliani and Miller, 1958). Otherwise, the pattern of financing depends upon their respective opportunity costs. While the cost of borrowings could be interpreted as interest rate, the costs of new issues and retentions could be interpreted as opportunity costs determined by government policies, floating costs, and so on. Finance is expected to be raised from the three sources, until their respective marginal productivities are equal. Thus, given the relative opportunity costs, one of the motives of generating corporate savings is to finance new investment.

(ii) To finance inventory investment.

Maintaining inventory stocks is generally, a short-term requirement. Stocks of raw materials are needed to be maintained, depending upon the uncertainties in their supplies, and similarly, stocks of output, to take care of demand fluctuations. Since inventory financing is a short-term phenomenon, sources such as new equity issues cannot be resorted to. Further, many-a-time, there may be institutional restrictions on the availability of long-term credit for inventory purposes. Thus, inventory financing is usually sought through profit retentions and short-term borrowing.

(iii) To keep a cushion for dividend payments. If firms aim at regular and stable dividend payments, then savings are residually determined depending upon fluctuations in income. By far, this is the most frequently observed phenomenon in the world (see for instance Lintner (1956), Dhrymes and Kurz (1965), Davenport (1965), Feldstein and Fleming (1971). In India also, empirical evidence gathered by many past studies appear to support the 'residual' determination of savings. (For instance, Mazumdar (1959), Purnanandam and Rao (1966) Sastry (1968), Rao and Sarma (1971) and Krishnamurty and Sastry (1971).

2. Specification of the Model

The specification of savings model might differ depending upon which motive is primarily responsible for corporate savings. For example, if the savings are motivated by the needs of investment financing, fixed or inventory, then variations in savings should reflect a conscious effort on the part of the management to realise a certain flow of internal finance envisaged at the time of planning for new investment. The internal savings are planned even before current profits are known. Assuming that the retentions are planned on the basis of some average of 'permanent' level of profits, one can specify that

$$R_t = a_0 + a_1 Y_t^* \qquad (1)$$

where R_t denotes current retentions of a firm, Y_t^* the 'permanent' income (a_0 and a_1 being the parameters of

the equation). If Y_t^* is interpreted as a weighted average of actual income of the past years, and if the weights are assumed to decline geometrically, then the relation between actual income Y_t and Y_t^* can be written as

$$Y_t^* - Y_{t-1}^* = a_2(Y_t - Y_{t-1}^*) \quad (0 \; a_2 \; 1) \qquad (2)$$

The two equations yield a behaviournal form of retentions as

$$R_t = a_0 \; a_2 + a_1 \; a_2 \; Y_t + (1-a_2) \; R_{t-1} \qquad (3)$$

If on the other, the residual theory of corporate savings is assumed to hold, then it follows that the main motive of retentions for a firm is to maintain dividends at a stable proportion of income, Y_t. This would be in accordance with the preferences of many of the shareholders to have a regular and uniform flow of dividends. In the process, the fluctuations in income are not fully allowed to be reflected in dividends. This is often interpreted as though a firm desires certain level of dividends depending upon the current income and other factors, but it will not adjust the actual dividends fully to the desired level. This behaviour of dividends is depicted by two equations. The actual dividends, D_t are determined as

$$D_t - D_{t-1} = b_0 + b_1 \; (D_t^* - D_{t-1}) \qquad (4)$$

where the desired dividends, D_t^* are determined by

$$D_t^* = b_2 Y_t \qquad (5)$$

Since the retentions are a mere residual, the resultant equation describing the retentions behaviour can be derived as[1/]

$$R_t = -b_o + (1-b_1 b_2) Y_t - (1-b_1) D_{t-1} \qquad (6)$$

In the real world however, it is only proper to assume that corporate savings are motivated neither solely due to investment demand factors nor are they a mere residual after dividend payments, but are due to a combination of all the motives. Therefore, for the purpose of this study we retain equation (6) as this specification appears to be more general in the sense that though it is based on the residual hypotheses, it is also capable of taking account of the investment motives for savings through the factors Y_t and R_{t-1}. We treat this equation as our starting point for describing the corporate saving behaviour[2/].

1/ In fact, based on this specification a test can be conceived as to which motive works stronger for corporate savings. For example the equation (6) can also be written as

$$R_t = -b_o + (1-b_1 b_2)Y_t + (1-b_1)R_{t-1} - (1-b_1)Y_{t-1}$$

The difference between the two alternative models is the lagged income variable, Y_{t-1} which appears as one of the factors affecting retentions. The question can be resolved to some extent by the statistical significance of the estimated coefficient of Y_{t-1}, with correct (-ve) sign. But the test is subject to various estimation since the OLS (or RLS) methods are not suitable.

2/ This specification also seems to have adequate support by the past empirical studies such as Tinbergen (1939), Dobrovolsky (1951), Lintner (1953) and Mazumdar (1959).

The view that firms care more to maintain dividend stability is a phenomenon observed by many empirical studies in western economics. In India also, this hypothesis is found to be applicable in general. But if one looks into the government policy of credit restrictions, double taxation of dividends as well as uncertainties in availability of raw-materials and so on, one expects that Indian companies should in fact be determining savings first, and distribute the residual profits as dividends.

If saving motives of a firm include financing of investment then it is necessary to specify a simultaneous model that describes the interdependence between corporate savings, investment and income. Such a model will help in bringing out the possible impact of the exogenous variables, including the policy variables on corporate savings effort.

In specifying an interdependence model, we shall retain equation (6) to describe corporate retentions. Also the exogenous variables that enter the retentions equation represent the policy variables, particularly tax and credit factors. Investment appears in the equation to represent the demand for savings. The cost of credit financing could be taken as an exogenous factor to take account of the substitutiability between internal and external sources of financing the investment. The retentions equation thus, will be of the form

$$R_t = f_1 (Y_t, D_{t-1}, I_t, i_t) \qquad (7)$$

where i_t is some relevant rate of interest representing the cost of borrowing, I_t represents the demand for investment and other symbols are as explained above. This function describes the retentions determination largely in terms of 'residual' hypothesis, but, softens its extremeness by considering factors such as investment demand and cost of borrowing to take account of possible interdependence between investment and saving decisions.

To establish the inter-relation it is necessary that we also consider investment determination which may indicate the possible impact of savings on investment. Out of the various theories of investment behaviour, the one favoured most appears to be derived from the neoclassical theory of investment, combined with accelerator theories.

The neoclassical theory[3/] states that current investment depends on the capitals stock at the beginning of the period and changes in the desired level of capital in the previous periods. The form of the relationship depends upon the form of the distributed lag function and the rate of replacement. The desired level of capital depends on sales turnover and the rental cost of capital which, under optimal conditions would be equal to the marginal productivity of capital.

3/ Prominent among the investment determination studies based on neoclassical theory are, Jorgenson (1967), Hall and Jorgenson (1971), Bischoff (1971) and Coen (1971).

Following this theory the desired stock of capital at a point of time, K_t^*

$$K_t^* = f\,[SLS_t,\ (c_t/P_t)] \qquad (8)$$

SLS_t = current or expected sales turnover representing the demand for K_t^*, c_t = the rental cost of capital, and P_t = the price of the product. The rental cost of capital could be assumed to be a weighted average of respective costs of financing from the sources, external as well as internal, where the weights are optimally determined. In a world of perfect competition, with no taxes and zero costs of floating new shares etc., the costs of financing are equal and firms are indifferent regarding the structure of financing. In the real world, the tendency would be to finance the investment from each of the available sources until their respective marginal productivities are equal. We assume that the cost of credit financing can be represented by i, a rate of interest relevant, (say, a weighted average of the long term rates where the weights are determined on the basis of different sources of credit). The cost of internal financing would mean the opportunity cost of retentions in terms of dividends paid. These costs are mostly on account of taxes which will be discussed later. However, as we intend to depict a flow of funds model with interdependences between savings and investment, we express K_t^* in terms of availability of total savings denoted by S_t. Besides others, c also depends on the ratio of capital goods price P_{ct} to the product price P_t. Thus, the desired capital stock, K_t^*

$$K_t^* = f\,[SLS_t,\ S_t,\ i_t,\ P_{ct}/P_t] \qquad (9)$$

Various processes are suggested in the literature as to how the changes in the desired stock of capital are translated into changes in the current investment. One of the most popular processes is through distributed lags. The current gross investment FI_t, rate of depreciation

$$FI_t = \sum_{j=0}^{r} \gamma_j\,[K_{t-1}^* - K_{t-1-i}^*] + \delta K_{t-1} \qquad (10)$$

where δ is the natural rate of depreciation and γ_j are weights. Assuming that the weights follow Koyck system can be equated to $b(1-b)^j$. Also, by definition, $K_{t-1} = FI_{t-1} + (1-\delta)\,K_{t-1}$, is equal to sum of all past net investments, and thus

$$K_t = \sum_{j=0}^{n} b(1-b)^j\,\delta\,K_{t-1}^* \qquad (11)$$

From (10) and (11) it is possible to derive

$$FI_t = b\,(K_t^* - K_{t-1}) + \delta K_{t-1} \qquad (12)$$

$$= [f(SLS_t,\ s_t,\ i_t,\ P_{ct}/P_t) - K_{t-1}]\,b + K_{t-1}$$

We drive the investment relation to be used in our inter-dependence model as

$$FI_t = f\,[SLS_t,\ S_t,\ i_t,\ P_{ct}/P_t,\ K_{t-i}] \qquad (13)$$

The variables SLS_t, S_t, i_t, and P_{ct}/P_t can also be replaced by their expected levels.

It should be noted that the above relation mostly describes only the fixed part of the total investment. The determination of the other part, the inventory investment need not be same.

We specify the determination of inventory investment as follows: Desired net additions to stock of raw materials or finished products are assumed to be guided by expectations regarding the sales turnover, given the availability of finance. Upto this point the specifications is similar to equation (13). The principal difference is that now the price of capital goods need to be replaced by price of raw materials and the capacity variable K_{t-1} has little role to play. Thus the inventory investment, (INV_t) function is

$$INV_t = f\left[SLS_t, S_t, i_t, P_{rt}/P_t\right] \qquad (14)$$

where P_{rt}/P_t is the relative price of raw material goods.

3. The Tax Factors

Corporation taxation enters the above model through several channels. Firstly, taxes such as corporation income tax, super tax, surtax and so on, reduce the profits available either for saving or for distribution as dividends. Secondly, if dividends and retained profits are taxed at different rates, then

the choice between dividends and retentions might be affected whenever the tax differential is changed. Thirdly, reduction in the tax liability by granting investment incentives encourages investment and reduces the depression effect of taxes on profits base. At the same time, tax laws that require part of the savings resulting from the availing of investment incentives encourages savings.

The first and second types of tax effects can be captured as follows[4/]: Assume that a firm chooses a particular combination of net dividends and net retentions subject to the available profits, and say, 'tax opportunity' prices of dividends retentions. The profit allocation function may be written as

$$Y = P_s R + P_d D \tag{15}$$

where P_s and P_d denote 'tax prices'. The tax prices denote the amount of gross allocation required to realise one unit of net dividends or net retentions as the case may be. For example, under 'Classical' income tax system

$$R_g/R = \frac{1}{1-t} \tag{16}$$

$$D_g/D = \frac{1}{(1-t)\ (1-t_d)} \tag{17}$$

4/ For a more detailed theoretical discussion of the tax impact on profit allocation between dividends and retentions, see. Feldstein (1970), Moerland (1975), King (1977) and Sarma (1982).

where t = tax rate on profits,
and t_d = tax rate on dividend incomes.
The tax prices, P_s and P_d in this case are, respectively $1/(1-t)$ and $1/(1-t)\ (1-t_d)$.

Further, assume that a firm has a map of indifference utility curves each showing a unique level of utility obtained from alternative combinations of R and D, the utility being the realisation of the firm's objectives. Let the utility function be $U = F\ (D,R)$. The optimal combination of R and D can be obtained by maximising the utility subject to the profit allocation function. The first order conditions of constrained maximisation yield that

$$U_d'/U_s' = P_d/P_s \qquad (18)$$

Rationality assumptions restrict the shape of the utility function to be linear homothetic. Empirical investigations further reveal that a simple Cobb-Douglas type adequately describes the function[5/]. Thus assuming

$$U = A\ D^{\alpha}\ R^{\beta} \qquad (19)$$

the first order condition can be written as

$$\frac{\alpha}{\beta} \cdot \frac{R}{D} = \frac{P_d}{P_s} \qquad (20)$$

5/ See Feldstein (1970).

Substituting for R from the profit allocation condition and denoting θ as P_s/P_d, A as $\alpha/(\alpha+\beta)$ and π as $1/P_s$ then optimal dividends D can be obtained as

$$D^* = AY\pi\theta \qquad (21)$$

The variables π and θ take account of the tax effects, the former denoting the depression effect of profit taxes and the latter denoting the effect of tax discrimination between retentions and dividends.

Accordingly, in the savings function the variable Y_t will be replaced by $(Y\pi\theta)$ [6/].

The third way taxes enter the model is through the investment incentives. The effect of the investment incentives can be again in three ways: First any reduction in the tax liability reduces the cost of capital 'C' and thus raises the rate of return on capital. The prospect of higher return might itself encourage firms to go for new investments. Secondly, the tax reduction being linked to new investment some investment might take place over and above what is warranted, depending upon the supply of funds. Thirdly, the deductions as a result of these tax incentives not being available for distributions, raises the corporate savings which in turn might encourage investment further.

6/ Thus it should be noted that the composite variable $Y\pi\theta$, though does not facilitate separate testing of the tax variables a previous study, already established the relevance of the two variables in the Indian context. See Sarma (1982).

The first two effects of tax incentives are taken care of by the tax factors in the investment function. Since the tax rate used is effective rate, it takes account of the expected rise in the rate of return. To take account of the third effect we specify that

$$X_t = f\ (FI,\ Y\ \pi\ \theta\ ) \qquad (22)$$

where X_t denotes that part of savings which results from tax incentives. Also we shall include the variable in the investment function to take care of the impact of tax incentives. Finally, the model of corporate savings behaviour we propose to bring-out the tax effects is as follows:

$$\begin{aligned}
X_t &= f\ [FI_t,\ Y\ \pi\ \theta_t] \\
R_t &= f[Y\ \pi\ \theta_t,\ I_t,\ D_{t-1},\ i_t] \\
FI_t &= f[SLS_t,\ S_t,\ i_t, \pi_t,\ K_{t-1}, (P_c/P)_t] \qquad (23) \\
INV_t &= f\ [SLS_t,\ S_t,\ i_t, \pi_t, (P_r/P)_t] \\
I_t &= FI_t + INV_t \\
S_t &= R_t + X_t
\end{aligned}$$

Essentially the model is designed to describe the interdependence between savings and investment behaviour and to bring out the tax effects. In what follows the model will be tested on different data sets.

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III. EMPIRICAL RESULTS

The empirical analysis is proposed to be conducted using mainly two sets of data: (1) aggregate time-series data on medium and large public limited companies published by the Reserve Bank of India (RBI), and (2) time-series as well as cross-section data on a sample of companies collected specifically for the purpose. Among other advantages, use of the two sets of data will facilitate cross-checking of the econometric results.

1. Empirical Results Based on RBI Data (Time-series)

We confine our study to the medium and large public limited and medium and large private limited companies, as these two groups together hold over 90 per cent of the private corporate sector's capital.

The savings behaviour model specified in the previous section is fitted seperately to the two sample groups, by means of Two-stage Least Squares (TSLS). The results are presented in Table 2.

a. Regression results (Public Limited Companies). All the four equations of the model fit the aggregate series well. Particularly the specification for the retentions (depreciation + retained profits) turns out to be the most appropriate. All the four explanatory variables, namely, income base (which is a composite variable, $Y\pi\theta$, consisting of gross cash flow and tax factors), investment demand, interest rate and lagged dividends are statistically significant with appropriate signs. Particularly, the significance of

TABLE 2

Empirical Results Based on RBI Data, Obtained by Two-Stage Least Squares

Independent variables	Public Limited Companies				Private Limited Companies			
	Retention	Tax incentive savings	Fixed investment	Inventory investment	Retention	Tax incentive savings	Fixed investment	Inventory investment
Retention								
Tax incentive savings								
Fixed investment		0.221*				0.101**		
Inventory investment								
Savings			0.189*	0.465**			1.804*	1.143**
Investment	0.189**				0.174**			
Income* Pi(ef)* Theta	0.130**	0.053			0.188**			
Dividends (-1)	-0.349*				-0.35*			
Interest rate	2.035**		-1.053*	-1.717**	1.428**		-5.562*	-2.334**
Sales charge			0.068**	0.239**			-0.001	0.095*
Pi(ef)			0.706**	0.078			-0.192	0.499*
Capital stock			-0.03				-0.282*	
W_{pi}(cap)/W_{pi}			0.331**				0.483*	
W_{pi} (raw-materials)/W_{pi}				0.117**				0.317*
R^2	0.907	0.322	0.82	0.966	0.89	0.338	0.616	0.72
F	48.886**	3.602*	13.69**	108.659**	31.416**	6.646*	3.479*	7.392**
SEE	0.028	0.007	0.026	0.017	0.826	0.01	0.063	0.077
DW	1.582	1.955	1.41	1.925	1.842	1.354	2.194	2.178

investment variable indicates some amount of planned effort of saving for ploughing back purposes. The significance of the interest variable shows that firms do not hesitate to substitute debt financing by internal savings whenever the relative cost structure changes in favour of the latter. However, the significance of the lagged dividends supports Linter's hypothesis that firms are concerned to maintain dividend stability even at the cost of realising planned savings. The coefficient of lagged dividends indicates the extent of 'dividend inertia'. That is, current dividends (as a result, current retentions) are adjusted by only 60 per cent to the desired level. Thus the retentions equation shows that corporate savings are determined both as result of investment motives as well as dividend stability motives. The significance of savings variable in the two investment equations only supports the presence of investment motive for savings. Besides they are also proof enough for the interdependence between investment and saving decisions.

The significance of tax factors which are introduced as relative opportunity tax costs of retained profits in the investment equation merit our attention. The tax depression variable is highly significant in fixed investment equation, while it turns out to be insignificant in the case of inventory equation. Besides, the tax cost is one of the component which is also significant. All this shows that the impact of tax on both saving and investment is substantial.

/ of the income base variable in the retentions equation,

b. Regression results (Private Limited Companies). The fitting of the model to the private limited companies data yields almost similar results. As in the case of public limited companies, retentions equation turns-out to be highly significant, all the four explanatory variables having significant coefficients. Once again the equation shows that Indian companies determine their savings by balancing the mutually opposite objectives of investment financing and maintenance of dividend stability. Further, both fixed as well as inventory investments appears to be reasonably sensitive to the availability of internal funds and costs of debt financing.

The significance of the tax depression variable is subsumed in the case of retentions equations by the income variable whereas it turns out to be not relevant for the investment decisions of private limited companies.

2. Empirical Results Based on Our Sample Companies

The adoption of the RBI sample for studying the corporate behaviour is open to some objections. The objections arise on account of the quinquinnial revisions RBI has been making in its sample coverage, and seperate sample surveys conducted for different groups of companies. To some extent this problem has been taken care of in our empirical exercise by scaling down all the non-ratio variables by paid-up capital, which is the sample parameter. Further, the RBI data being published in the form of aggregate

time-series will not facilitate analysis of the impact of certain firm-specific factors such as size, age, rate of growth, actual tax liability, and so on. To study the impact of the firm-specific factors on corporate savings behaviour, we selected a seperate sample of companies. (Appendix).

3. The Regression Analysis (Based on Sample Time-series)

The sample as a whole, as noted above, is designed to examine the corporate savings behaviour from different angles. It provides for testing of the model on a number of data-sets, both time-series as well as cross-sections, depending upon the purpose.

To start with, the model is fitted to the aggregate time-series for all the sample companies. Second, it is well-known that the structure of investment and therefore, the saving needs differ between manufacturing and non-manufacturing companies. For example, the plant and machinery component of fixed investment as well as the raw material component of inventory might be substantially higher for manufacturing. To test whether there exists a difference in saving behaviour, the model is fitted to manufacturing and non-manufacturing companies separately. Thirdly, it should be noted that for the above three time-series, the yearly observations do not pertain to same companies. The sample observations also include new companies that have been registered after 1960 in different years. To the

extent. the saving capacity of newer companies differ from older companies, it is worthwhile to purge the observations off the new entrants. Thus the model is re-estimated on the three time-series after removing those companies which have been registered after 1960. Fourthly, to specifically test whether size of a company has any impact on saving behaviour, the model is fitted to the five groups of manufacturing companies classified by their size of paid-up capital; (i) Rs 0.5 to 1.0 crore, (ii) Rs 1.0 to 5.0 crore, (iii) Rs 5.0 to 10.0 crore, (iv) Rs 10.0 to 20.0 crore and (v) 20 crore and above.

a. The retentions equations (Table 3). By far, this is the most consistently significant equation of the system. The factors hypothesized to influence corporate retentions are investment, income base (as defined earlier), lagged dividends, and interest rate (long-term). Thus the equation combines the existing theories regarding the motives of corporate retention.

At the aggregate level (equation 1) the equation indicates that investment needs form the main objective of retentions. This is supported by the significance of interest rate variable with a positive sign. The significance of interest rate also indicates that firms do attempt to substitute retentions for external financing depending upon the relative cost-structure of financing. On the other, the lagged dividends variable though has the correct sign is not significant while the income variable is only at 10 per cent level.

TABLE 3

Corporate Savings Behaviour – TSLS Results Based On Sample Companies' Retentions Equations

S. No.	Data sets/Independent variables	Investment (e)	Income base	Dividends (t-1)	Interest rate	Constant term	R^2	F	SEE	DW
	Time-series:									
1.	All companies	0.388**	0.146*	-0.083	1.56**	0.026	0.78	12.6**	0.04	1.81
2.	All manufacturing companies	0.512**	0.946**	-1.547*	2.447**	0.610	0.89	27.9**	0.04	1.93
3.	All non-manufacturing companies	0.085**	0.373**	0.308	3.162**	-0.117	0.94	62.3**	0.04	1.90@
4.	All old companies	0.102	0.117*	-2.455**	2.234**	-0.151	0.85	19.27**	0.05	1.74
5.	Manufacturing companies (old)	-0.165	0.424**	-2.338**	1.852**	-0.054	0.83	16.76**	0.05	2.06@
6.	Non-manufacturing companies (old)	0.095**	0.473**	0.239	4.172**	-0.201	0.97	113.45**	0.05	1.96@
	Manufacturing companies (old) classified by size of paid-up (Rs. crore):									
7.	0.5 – 1.0	0.126**	0.445**	-1.703**	1.771**	-0.094	0.89	28.74**	0.04	1.75
8.	1.0 – 5.0	0.075	0.153*	-1.278**	1.519**	-0.105	0.64	6.27**	0.06	1.51
9.	5.0 – 10.0	0.043	0.620**	-1.287**	1.467**	-0.149	0.96	75.11**	0.04	1.69@
10.	10.0 – 20.0	0.080	0.474**	0.519	0.077	-0.088	0.95	72.23**	0.18	2.13
11.	20.0 and above	0.200**	0.033	0.52	0.782*	0.115	0.57	4.69*	0.05	2.38
	Cross-sections:									
	Manufacturing (Old):									
12.	1965	0.200**	0.303**	0.469**	0.110	0.013	0.95	230.44**	0.10	-
13.	1970	-0.090	0.899**	-0.596**	0.022	0.049	0.93	152.78**	0.09	-
14.	1975	-0.027*	1.018**	-1.021**	-0.059*	0.006	0.995	2280.18**	0.03	-
15.	1980	-0.002	1.020**	-1.106**	-0.015*	-0.007	-0.997	3908.29**	0.03	-
	Manufacturing (new):									
16.	1975	0.008*	0.989**	-1.020**	-0.052	0.044	0.999	4562.65**	0.22	-
17.	1980	0.007	0.986**	-1.058**	0.095	0.009	0.99	896.61**	0.05	-
	Non-manufacturing (all):									
18.	1965	-0.006	0.899**	-1.027**	0.093	-0.062	0.999	1469.79**	0.0[illegible]	-
[illegible]	1970	-0.017	1.021**	-1.060**	-0.091	-0.004	0.999	1916.04**	0.01	-
[illegible]	1975	-0.023	1.004**	-0.003**	-0.154	-0.007	0.995	384.06**	0.03	-

Notes: ** Indicates the estimate being significant at 5 per cent level.
* Indicates the estimate being significant at 10 per cent level.
@ Reported results are after correction for auto-correlation.

There appears to be a clear-cut difference in the saving determination between manufacturing and non-manufacturing companies (equation 2 and 3). The equation is highly significant in both the cases with R^2 around 0.9. One obvious difference between the two equations is that while lagged dividends is significant in the case of manufacturing companies it turns-out to be insignificant in the case of non-manufacturing companies, hinting the absence of the dividend motive in the latter case. In both the cases however, investment requirement as well as financing cost-structure variables emerge as highly significant in determining the savings.

Purging the time-series off the new entrants (registered after 1960) yields somewhat different results. An important development is that now the lagged dividends turn-out to be highly significant, and investment variables becomes insignificant (equation 4).

The results obtained for manufacturing and non-manufacturing companies registered prior to 1960 (equations 5 and 6), are in line with those of equation 4. Particularly, in the case of manufacturing companies the investment demand variable turns-out to be insignificant. However, in both the cases long-term interest rate remains significant indicating that firms even though save primarily to maintain dividend stability, would not hesitate to substitute debt financing with internal funds if the cost of debt increases. In the case of non-manufacturing companies (registered before 1960), however, investment demand variable remains to be significant.

Comparison of the regression results of equation 1 and 2 with 4 and 5 clearly leads us to the following conclusions: (a) There is a substantial difference between old and new companies regarding the retentions behaviour. The older companies' retention are primarily residually determined after dividend payments as is evidenced by the significance of lagged dividends variable whereas the main motive of retention for new companies might be to meet the investment requirements.

The conclusions regarding the behaviour of new companies is only a deduction obtained from the behaviour of older companies behaviour and all companies. For further empirical support one has to study the cross-section results of new companies.

To study the behaviour with respect to the size of a company seperate equations were fitted for each size group of companies (old), classified by the size of their paid-up capital (equations 7 to 11). These equations not only provide empirical support at the disaggregated level but also brings-out any differences in the behaviour due to paid-up capital size.

On the whole, these five equations (7 to 11) taken together support the contentions of equation (5). In three out of the five equations lagged dividends turn-out to be significant whereas the evidence for the investment motive theories of retention is weaker with only two equations carrying significant coefficients for investment variable.

However, between the groups there exists some amount of difference in the saving determination. For companies falling within the first group (paid-up capital range Rs 50 lakh to Rs 1 crore), both dividend stability motive as well as investment motive appears to be equally relevant in retention determination. In the case of the next two groups, (paid-up capital ranges Rs 1 crore to Rs 5 crore and Rs 5 crore to Rs 10 crore) investment needs do not seem to matter for retention decision. The behaviour of the next two groups (paid-up capital ranges Rs 10 crore to Rs 20 crore, and Rs 20 crore and above) appears to be unique. Neither the dividend stability nor the invesement needs turnout to be significant in equation (10) (paid-up capital range Rs 10 crore to Rs 20 crore). The investment demand variable turns out to be significant for the last group. Also the interest rate variable which is highly significant so far, seems to be not so relevant for the last two groups (equations 10 and 11). One obvious explanation could be that these companies are so large with high capacity to generate internal funds and also carrying high credit-worthiness, that they do not need to worry about investment needs or dividend payments.

However, the empirical analysis of the retention equation leaves a loose end. We noted that in the aggregate time-series equation estimated for all companies, all manufacturing companies and all non-manufacturing companies, shows the investment and interest rate variables as carrying highly significant coefficients. But as we fit the equation at more and more disaggregated levels of data, these two variables

turn-out to be insignificant. To what extent this is due to aggregation error is not known.

b. Tax incentive savings equation.(Table 4). The other component of corporate saving is that required for claiming tax incentive benefits. The specification in this case is straight forward. Since the claims for tax deduction is linked to new fixed investments and since a fixed proportion of the claims forms this component of saving, fixed investment is hypothesised to explain much of the variations in there savings. Income variable also enters the equation as a constraining factor.

The empirical results are not very encouraging. The regression is not significant at all in the case of all companies (time-series), as well as all manufacturing companies. However, in the case of non-manufacturing companies (equation 3) for which the F-statistic is barely significant, both fixed investment and income base turn out to be fairly significant.

The overall fit in terms of R^2 improves dramatically when the aggregate time-series data are purged off the new companies (registered after 1960). Yet fixed investment coefficient remains insignificant for the manufacturing companies as well as for all companies.

Fitting of the equation at further disaggregated level on different size groups of manufacturing companies yields a consistently significant coefficient

TABLE 4

Corporate Savings Behaviour - TSLS Results Based On Sample Companies: Tax Incentive Savings Equation

Sl. No.	Data sets/Independent variables	Fixed investment (a)	Income base	Constant term	R^2	F	SEE	DW
	Time-series:							
1.	All companies	0.044	0.085*	0.167	0.05	0.80	0.03	1.91
2.	All manufacturing companies	0.110	0.072*	-0.008	0.02	0.34	0.04	2.52
3.	All non-manufacturing companies	0.076**	0.060**	-0.016	0.25	5.71**	0.03	1.83
4.	All old companies	-0.024	0.066*	-0.005	0.68	9.65**	0.04	2.54
5.	Manufacturing companies (old)	-0.037	0.072*	0.027	0.61	9.11**	0.04	2.22
6.	Non-manufacturing companies (old)	0.049*	0.067*	-0.020	0.49	7.54**	0.05	2.20
	Manufacturing companies (old) classified by size of paid-up capital (Rs. crore):							
7.	0.5 - 1.0	0.036*	0.066*	-0.021	0.45	6.60**	0.02	1.99
8.	1.0 - 5.0	-0.050*	0.062*	0.008	0.26	2.78*	0.02	1.94
9.	5.0 - 10.0	0.270*	0.432*	-0.453	0.24	2.53*	0.13	2.39
10.	10.0 - 20.0	0.398*	0.026	-0.278	0.47	6.98**	0.47	2.29
11.	20.0 and above	0.343*	-0.114	0.291	0.15	1.46	0.06	2.30
	Cross-sections:							
	Manufacturing (old):							
12.	1965	0.125**	-0.010	-0.005	0.46	16.38**	0.09	-
13.	1970	-0.251	0.186**	-0.003	0.11	2.35	0.17	-
14.	1975	-0.062	-0.056	0.120	0.01	0.25	0.31	-
15.	1980	-0.018*	0.132**	0.001	0.46	16.37**	0.07	-
	Manufacturing (new):							
16.	1975	0.114**	-0.083*	0.074	0.40	3.52**	0.15	-
17.	1980	0.107**	0.067**	-0.016	0.65	14.54**	0.09	-
	Non-manufacturing (all):							
18.	1965	0.003	0.028**	-0.222	0.99	398.99**	0.01	-
19.	1970	0.058	0.118**	-0.022	0.86	18.52**	0.03	-
20.	1975	0.125**	0.006	-0.021	0.80	20.91**	0.05	-

Notes: ** Indicates the estimate being significant at 5 per cent level.
* Indicates the estimate being significant at 10 per cent level.
@ Reported results are after correction for auto-correlation.

of fixed investment, though the overall fit for each group is lower than that for the aggregate equation.

c. The fixed investment equation (Table 5). Though the main focus of the study is corporate saving behaviour we need to look into the corporate investment determination also, essentially to examine the interrelation between corporate saving and investment decisions and the resulting feed-back effect on saving.

We have noted a dichotomy while discussing the estimated retention equation, that the investment demand variable which carries a significant coefficient for the aggregate time-series data, turns-out to be insignificant at the disaggregated levels. Part of the problem could due to aggregation error. An exemination of the investment determination could provide further clues. Further it is also interesting to study how availability of corporate savings provide stimulus for new investment.

The fixed investment is sought to be determined by corporate saving, sales change, capital stock, interest rate, tax cost of internal funds, and ratio of capital goods prior to price of all commodities.

As was the case with the savings equations, regressions fitted to aggregated time-series data containing new entrants do not yield meaningful results. Among the first three equations, only equation (3) yields a significant 'fit'. On the

TABLE 5

Corporate Savings Behaviour TSLS Results Based On Sample Companies: Fixed Investment Function

Sl. No.	Data sets/Independent variables	Savings (e)	Interest rate	Sales change	Tax variable	Capital stock (t-1)	Capital goods price + price of all commodities	Constant term	R^2	F	SEE	
	Time-series:											
1.	All companies	-1.187	2.926	0.263*	1.545	0.012	-0.447	-0.155	0.31	0.68	0.09	2
2.	All manufacturing companies	0.816	0.777	-0.111	-0.381	-0.161	0.021	1.074	0.09	0.18	0.19	1
3.	All non-manufacturing companies	0.134	-15.015	0.154*	2.209	0.168*	1.029*	-2.902	0.59	2.11**	0.27	1
4.	All old companies	-1.240*	0.997	0.142*	0.386	0.075	0.773*	-0.582	0.29	0.82**	0.16	2.
5.	Manufacturing companies (old)	-0.015	-1.16	-0.026	0.292	0.026	1.023	-0.823	0.25	0.66**	0.16	1.
6.	Non-manufacturing (old)	1.114	-20.502*	0.511*	-0.281	0.046	-0.668	1.174	0.65	3.75**	0.50	2.
	Manufacturing companies (old) classified by size of paid-up capital (Rs. crore)											
7.	0.5 - 1.0	-0.353	-13.851**	0.222*	-0.872*	0.393*	0.148	0.594	0.65	3.69*	0.17	1.
8.	1.0 - 5.0	-1.143	-7.493**	0.025	0.384	0.464*	-0.090	-0.432	0.47	1.77	1.23	1.
9.	5.0 - 10.0	0.549*	-5.321**	0.016	-0.606	0.080*	0.093	1.285	0.58	2.81*	0.28	2.
10.	10.0 - 20.0	0.649**	-0.293	0.006	2.434**	0.043*	0.508	-2.424	0.75	5.91**	0.68	2.
11.	20.0 and above	-1.473*	0.726	0.216*	1.634*	0.003	-0.938	0.527	0.35	1.07*	0.12	1.
	Cross-section:											
	Manufacturing (old)											
12.	1965	0.841**	-0.482	0.018	0.354**	0.039*	-	-0.326	0.69	20.23**	0.45	1.5
13.	1970	0.204*	-2.533	0.018	-0.056	0.018	-	0.271	0.18	1.92	0.31	1.8
14.	1975	0.031	-0.452	0.012	0.35**	0.074	-	-0.167	0.29	3.67*	0.39	2.1
15.	1980	0.541**	-0.245	-0.025	0.390*	0.104**	-	-0.117	0.54	10.72**	0.72	1.5
	Manufacturing (new)											
16.	1975	0.646	-1.903	0.091*	-0.619	0.190	-	-1.694	0.65	4.84**	1.02	2.1
17.	1980	0.147	-3.073**	0.078**	-0.113	0.229**	-	-0.722	0.70	9.16**	0.55	1.8
	Non-manufacturing (all)											
18.	1965	-0.168	0.698	0.020	0.069	0.125**	-	-0.256	0.88	6.02**	0.19	2.0
19.	1970	0.673*	-1.008	0.110	-0.370	0.038	-	0.317	0.79	3.72**	0.28	2.30
20.	1975	1.527**	-1.660*	-0.078*	0.422	0.053*	-	-0.294	0.96	26.09**	0.25	2.50

Notes: ** Indicates the estimate being significant at 5 per cent level.
* Indicates the estimate being significant at 10 per cent level.
@ Reported results are after correction for auto-correlation.

other all the regressions run on the older companies yield better fit. Between manufacturing and non-manufacturing groups the results of the non-manufacturing equation yields meaningful results. The main factors determining fixed investment turn-out to be sales change and interest rate according to the aggregate time-series equations. Regressions run on manufacturing companies grouped by their size, reveal the behaviour in a better way. Interest rate and capital stock comes out to be consistently significant. But of particular interest to this study is the performance of savings and tax cost variables. Savings variable is significant only in the case of two size groups, with paid-up capital Rs 5.0 crore to Rs 10 crore and Rs 10 crore to Rs 20 crore. Similarly the tax cost variable is significant with correct sign only for the last two size groups (with paid-up capital Rs 10 crore to Rs 20 crore and Rs 20 crore and above).

d. <u>The inventory equation (Table 6)</u>. The time-series regression results of the inventory determination equation are not encouraging. In most of cases (Table 9) the F-statistics are not significant, except in the case of non-manufacturing (all) companies. The most important determinant for inventory is sales change as expected. Savings fail to be an important factor affecting invention. Thus the anticipated dependence of inventory investment on availability of internal sources is not clear.

TABLE 6

Corporate Savings Behaviour - TSLS Results Based On Sample Companies: Inventory Equations

Sl. No.	Data sets/Independent variables	Savings (e)	Interest rate	Sales change	Tax variable	Raw-material price ÷ all commodities price	Constant term	R^2	F	SEE	DW
	Time-series										
1.	All companies	-0.081	2.307	0.166	0.976	0.097	-0.874	0.55	3.30*	0.08	1.79
2.	All manufacturing companies	-0.010	0.715	0.088*	0.523	-0.055	-0.247	0.45	2.11	0.07	1.73
3.	All non-manufacturing companies	0.256	2.621	0.175**	-1.579*	-0.266*	1.224	0.79	9.66*	0.11	2.00
4.	All old companies	-1.305	2.311*	0.079**	0.322	-0.002	-0.122	0.28	1.02	0.07	1.76
5.	Manufacturing companies (old)	-0.137	0.310	0.086	0.798*	0.026	-0.518	0.30	1.09	0.08	1.29
6.	Non-manufacturing companies (old)	-0.119*	-1.102	0.053	-0.017	-0.237**	0.383	0.48	2.35	0.06	2.19
	Manufacturing companies (old) Classified by paid-up capital (Rs. crore):										
7.	0.5 - 1.0	0.495*	2.500*	0.090	-0.162	-0.295	0.635	0.28	1.02	0.17	2.24
8.	1.0 - 5.0	0.091	0.402	0.027	0.251*	-0.104	0.039	0.36	1.49	0.06	2.13
9.	5.0 - 10.0	0.039	-0.149	-0.031	-0.421*	0.140	0.318	0.10	0.27	0.21	1.82
10.	10.0 - 20.0	-0.035	3.607*	0.044	-0.233	1.470*	-1.310	0.31	1.15	0.34	1.97
11.	20.0 and above	-2.939	-1.941*	0.621*	1.084	-0.696*	1.118	0.49	2.54*	0.15	0.94
	Cross-section Manufacturing (old)										
12.	1965	0.899**	-0.289	-0.005	0.023	-	0.001	0.52	11.92**	0.46	-
13.	1970	0.061	-2.159*	-0.002	0.141	-	0.332	0.53	0.61	0.35	-
14.	1975	0.468**	0.014	0.033	0.358*	-	-0.336	0.22	3.13*	0.53	-
15.	1980	0.356*	0.029	-0.025	-	-	0.161	0.08	0.97	0.68	-
	Manufacturing (new)										
16.	1975	0.886**	-4.003*	0.192*	-0.238	-	-0.127	0.87	21.74*	0.50	-
17.	1980	0.209	-1.722	0.005	0.206	-	0.215	0.08	0.43	0.74	-
	Non-manufacturing (all)										
18.	1965	-0.402	1.687**	0.084	0.016	-	-0.322	0.36	0.69	0.09	-
19.	1970	-0.114	1.492*	0.041*	0.030	-	0.157	0.86	5.44**	0.11	-
20.	1975	-0.042	-0.690	0.112*	-0.188	-	0.068	0.32	0.74	0.34	-

Notes: ** Indicates the estimate being significant at 5 per cent level.
* Indicates the estimate being significant at 10 per cent level.
● Reported results are after correction for auto-correlation.

4. The Regression Analysis (Based on Sample Cross-Sections)

The time-series analysis can take account of most of the factors affecting corporate saving behaviour as long as the changes in the determining factors are quantifiable. Where the changes are not amenable for quantification, the time-series regression analysis would not be adequate. For this purpose cross-section analysis at different points of time is more suitable. The cross-section analysis has been carried-out seperately for the three groups (a) manufacturing (old) for four years 1965, 1970, 1975, and 1980, (b) manufacturing (new) for two years 1975 and 1980, and (c) non-manufacturing (old and new combined) for 1965, 1970 and 1975.

a. The retentions equations (Table 3). In all the cases, the most consistent phenomenon has been the strong evidence in favour of residual determinations of retentions. Income base and lagged dividends has been the most important determinants of corporate savings. Wherever the investment and interest rate variables are significant, they carry wrong signs. Further testing of the coefficients of lagged dividends, reveals that in seven out of the nine cross-section equations it is not significantly different from unity.

b. The tax-incentive savings equations (Table 4). The cross-section analysis yields mixed results. In the case of old manufacturing group the fit is not significant for the year 1970, and 1975. For 1965 cross-section fixed investment carries a very significant coefficient. The income variable is significant for

the year 1980. In the case of new manufacturing group the fit is satisfactory and both the variables are significant. The equation fits the non-manufacturing group best with high R^2. In this case for 1965 and 1970 only income variable turns out to be significant and for 1975, fixed investment appears to be the only factor relevant.

c. The fixed investment equation (Table 5). The cross-section results in this case are more interesting than time-series. Not only the 'overall fit' is better than time-series, the significance of savings and tax variables is more pronounced. For example, the savings variable is significant in the case of manufacturing (old) for the yearly cross-section 1965, 1975 and 1960 and in the case of non-manufacturing, for the year 1970 and 1975 whereas the tax variable turns-out to be significant for the year 1965, 1975, and 1980 in the case of manufacturing (old).

d. The inventory equation (Table 6). As in the case of the above three equations 'cross-section' regressions yield better fit than time-series. An interesting development is that savings turn out to be a more important determinent than sales change. Sales change variable is significant only in the case of non-manufacturing companies for the year 1975 and in the case of non-manufacturing companies for the years 1970 and 1975. Savings variable is significant for three years 1965, 1975, and 1980 in the case of manufacturing companies (old) and in the case of new manufacturing companies for the year 1975.

On the whole looking at the above results we find that the interrelation between corporate saving and investment decisions is not totally absent. For some reasons, possibly technical the time-series analysis faith to unearth the relations clearly, whereas the cross-relation results are more satisfying.

Quantification of the Tax Efforts

The model takes into account not only the direct impact of taxes on profit allocation and savings, but also the indirect impact rhrough investment. The final impact of income taxes implied by this system can be computed from the reduced form equation of S. Let this equation be

$$S = C_0 + C_1 Y \pi \theta + \ldots\ldots + C_2 \pi$$

Where C_0, C_1, C_2 etc. are reduced form coefficients. Under 'Classical' tax system $\pi = 1-t$ and $\theta = 1/(1-t_d)$ where t is tax rate on corporation profits, and t_d is additional tax rate on distriented profits. The partial derivatives of S with respect to t and t_d are,

$$\partial S/\partial t = - C_1 Y/(1-t_d) - C_2$$

$$\partial S/\partial t_d = C_1 Y(1-t)/(1-t_d)^2$$

These partial derivatives indicate the final change in savings attributable to profits taxes at company level and taxes on dividend incomes, respectively. It can be seen that there tax efforts are not constant.

The effect of t varies with Y and t_d, and the effect of t_d varies with Y, t, and t_d .

In this study we kept Y, t, and t_d at their average levels (for time-series) so that the partial effects could be quantified.

Table 7 gives the percentage change in the savings due to one per cent change in the tax rates. Column (1) shows the percentage change in the corporate savings if the corporate profit tax rate is changed by one per cent. Similarly, column (2) shows percentage change in corporate savings induced by increasing the dividend income tax rate by one per cent. These results indicate the following.

a. Effect of corporation income-tax (tax depression effect). The aggregate results show that a one per cent rise in corporation income tax will depress Corporate savings by 2.3 per cent in the case of medium and large public limited companies and by 2.5 per cent in the case of medium and large private limited companies, both based on RBI sample. The estimate of the effect based on our sample of 117 public limited companies differs very little from RBI results. It is 2.1.

The disaggregated results (time-series) show that, between manufacturing and non-manufacturing companies the depression effect is higher for the latter. For manufacturing companies the average effect is 1.33 per cent while for non-manufacturing companies it is 2.7 per cent. The effect seems to be independent of company size.

TABLE 7

Tax Impact on Corporate Savings

S. No.	Data set		Percentage change in corporate savings due to 1 per cent change in: Corporation Income tax rate	Additional tax rate on distributed profits
	RBI sample			
1.	Medium and large public ltd.cos.		-2.3023	0.4778
2.	Medium and large private ltd. cos.		-2.5361	0.4972
	Our Sample (time-series)			
3.	All companies		-2.0545	0.215
4.	All manufacturing cos.		-1.3254	1.0651
5.	All non-manufacturing cos.		-2.6807	1.6566
6.	All old Companies		-1.5746	0.4108
7.	Manufacturing cos. (old)		-1.4476	0.3736
8.	Non-manufacturing cos.(old)		-1.7554	1.9948
	Manufacturing cos.(old) Classified by size of paid-up capital (Rs cr.)			
9.	0.5 - 1.0		-1.61	1.1628
10.	1.0 - 5.0		-1.1839	0.0578
11.	5.0 -10.0		-1.7102	4.1944
12.	10.0 -20.0		-1.5712	1.9093
13.	20.0 and above		-1.6375	0.0455
	Our sample (cross-sections)			
14.	Manufacturing (old)	1965	-3.4974	5.2461
15.	Manufacturing (old)	1970	-2.2059	2.8151
16.	Manufacturing (old)	1975	-2.3671	2.5178
17.	Manufacturing (old)	1980	-2.2740	1.9140
18.	Manufacturing (new)	1975	-1.9154	1.8381
19.	Manufacturing (new)	1980	-1.4310	1.8733
20.	Non-manufacturing(all)	1965	-3.9937	6.0432
21.	Non-manufacturing (all)	1970	-1.8074	4.5002
22.	Non-manufacturing (all)	1975	-4.566	3.6226

The cross-section results also show that the effect is higher for non-manufacturing companies than for manufacturing. Further, the cross-section results indicate the trends in the effects. It is clear that the effect is falling over time for manufacturing companies. In the case of manufacturing companies (old) the depression effect has fallen from 3.5 in 1965 to 2.3 per cent in 1980. In the case of new manufacturing companies also the depression effect has fallen from 1.9 to 1.4 per cent from 1975 to 1980.

b. Effect of personal income tax (tax shelter effect). The estimated effects vary between RBI and the sample results. While the percentage size in Corporate savings for one per cent in personal income tax (average tax rate) is around 0.5 for RBI samples, it is only 0.2 in the case of our samples. The difference could be due to the use of common tax differential variable both unlike in the case of tax depression variable.

The differential effect, as in the case of depression effect, is also higher in the case of non-manufacturing companies than manufacturing.

The cross-section results show that over the years this effect is falling. The results pertaining to older companies show that their saving determination is becoming less and less sensitive over time.

IV. SUMMARY AND MAIN FINDINGS

Private corporate sector in India is by no means an important source of domestic savings. Yet, within the sector the saving generation has been quite substantial so much so the private corporations are almost self sufficient in meeting their financing needs. Both the RBI sample and our sample data show that more than half of the gross cash-flows generated by corporations is retained as savings.

The government has been consistently adopting a policy of encouraging corporations to meet their financing needs by generating more and more internal funds. It has employed a number of tax instruments for the purpose. The tax instruments adopted range from the mildly coercive discreminatory taxation in favour of profit retention to making the savings compulsory in order to claim for certain tax deductions.

This study is aimed at examining the question as to what extent the government succeded in influencing the corporate decision processes at different levels and coerce them to save more.

The study is mainly empirical. A savings behaviour model for the corporate sector is developed consisting of four stochastic equations and two identies. The specification of the model is guided by three criteria: Firstly, the model is confined to that part of corporate decision mechanism that is concerned with saving generation. Secondly,

it is designed to take into account both investment and dividend stability motives of corporate saving. And thirdly, it is designed to facilitate introduction of tax factors affecting the profit allocation.

Taxation is hypothesised to affect corporate savings on three fronts: Firstly the profit taxes depresser the income base. Secondly discreminatory taxation affects the choice between dividends and rentantions. Thirdly, the requirement of compulsory reserves under the tax incentive scheme alters the tax 'opportunity cost' structure in favour of retentions. The form of the tax factors are rationally derived within a simple managerial utility maximization approach.

Data for testing the model are collected from two cources: (a) The aggregate time-series on public and private limited companies with paid-up capital above Rs 5 lakh based on the Reserve Bank of India publications; and (b) A sample of 117 public limited companies, with paid-up capital above Rs 50 lakh, specially collected from the Bombay Stock Exchange Directory to analyses the behaviournal differences from different angles, such as size, age, type of company, and so on. The use of the two sources facilitated cross-checking of the inferences.

1. Trends and Structure of Savings

The RBI sample shows that the rate of saving by public limited companies to be around 50 per cent in terms of gross cash flow, and our sample reveals a rate of 65 per cent for the public limited companies.

Considering the differences in the sample contents, one might conclude that large companies tend to save higher than others.

Further, the RBI sample reveals that the savings effort is higher in the case of public limited companies than in the case of orivate limited companies.

Regarding the savings structure, both the RBI sample as well as our sample shou that roughly 60 to 70 per cent of total savings of public limited companies arise due to provision for depreciations. Net profit retentions constitute only 20 to 23 per cent compulsory or semi-compulsory savings that arise due to various tax incentive schemes provide only 10 to 20 per cent of total savings. In the case of private limited companies the share of depreciation is slightly higher.

Further, our sample shows that between manufacturing and non-manufacturing companies the latter's savings rate (as per cent of cash-flow) is higher at around 75 per cent than the former's which is around 63 per cent. In both the cases, older companies save better than relatively new ones. The classification of our sample companies by size of their paid up capital, however, do not subscribe to the view that larger the size of a company higher would be the savings effort. The savings structure revealed by our sample more or less is the same as that of the RBI sample.

2. Findings of the Regression Analysis

The model is tested mainly on three types of data sets: (a) Aggregate time-series based on RBI sample (separetely for public and private limited companies), (b) time-series, aggregate as well as by different groups, and (c) cross-section of the sample companies for different bench-mark years. The model is estimated by two-stage least squares.

All the three types of data-sets yield reasonably good 'fit'. Between the RBI time-series (public limited companies) and our sample time-series, the former yield comparatively better fit. Further, between time-series and cross-sections, the cross-sections yield better fits.

Among the four equations of the model, the one specified for retentions yield the most satisfactory regression results. The retentions are sought to be explained by total investment, a composite income base which can be interpreted as the opportunity value of gross cash-flow after taxes in terms of profit retentions, lagged dividends and average effective interest rate. All the four factors turn out to be significant for most of the data sets. The RBI sample reveals the presence of both investment motive and dividend stabilisation motive in determining the savings, which regressions based on our sample yield mixed/companies (old) the absence of investment motive is conspicuous.

results. Particularly in the case of manufacturing

Analysis based upon the RBI data reveals a strong interdependence between corporate savings and investment. The savings variable is significant in both the investment equations. The estimated investment equation based on our sample data, are supportive to the interdependence hypothesis only at the disaggregated levels.

The impact of tax factors in the retentions equation is subsumed by the income base factor. The model as such does not test for the significance of the two variables, namely, the tax discrimination variable, denoted as θ , and the tax depression variable π , since it is already established by a previous study by Sarma (1982). The variable is included in the investment equation as a component of cost of capital. The RBI time-series, disaggregated time-series as well as cross-section based on our sample reveal a significant coefficient for the tax variables.

The simulation results show that an increase of one per cent in corporation income tax might in the long run reduce corporate savings by about 2 to 2.3 per cent. The depression effect is higher in the case of non-manufacturing companies than manufacturing companies.

Compared to the depression effect, tax differential or tax shelter effort is relatively lower. The estimate of percentage in corporate savings as a result of one per cent change in the personal income tax vary below 0.2 per cent on the

basis of a sample, and 0.5 per cent on the basis of RBI sample. Further, the differential effect is also higher in the case of non-manufacturing companies.

The results of the cross-section analysis for different bench-mark years show that corporate savings are becoming less and less sensitive over time.

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APPENDIX

1. The RBI Data

The Reserve Bank of India publishes annual data collected from the balance sheets and profit and loss accounts of selected samples of companies, separately for (i) medium and large public limited, (ii) medium and large private limited, (iii) large public limited (iv) large private limited (v) small public limited, and (vi) small private limited companies. The main advantage of using the RBI data is that the sample is quite large. For example, it covers around 80 per cent of the paid-up capital of the all public limited companies. The other advantage is that the data provide fairly comparable time series from 1950 to 1980. Further, the sample number of companies as well as its composition is revised every five years, thus taking account of new entrahts to the corporate sector. With a proper blowing-up factor it is possible to link-up the series between different five-year periods. However, the RBI sample is not without disadvantages. The main disadvantage is that the sample is not based on random methods. But this drawback might to some extent to compansated by its large coverage.

Table A1, shows the rate of savings (five-year average) of the two sample groups. The average rate of savings (either in terms of equity or in terms of cash flow) is higher in the case of public limited corporations than in the case of private limited companies. However, in both the cases the rates show an increasing trend. In the case of public limited corporations the rate of saving in terms of equity has gone-up from 24 per cent in 1961-62 to 33 per cent in 1978-79, while in the case of private limited

TABLE A1

Trends in Corporate Savings Effort (Based on Reserve Bank of India Data)
Medium and Large Public and Private Limited Companies

Period	Rate of saving in terms of gross cash flow	Rate of saving in terms of equity	Share of retained profits	Share of depreciation	Share of other savings
			Public Limited Companies		
1960-61 to 1964-65	48.52	23.85	26.75	59.76	13.47
1965-66 to 1969-70	51.30	24.93	20.11	66.99	12.87
1970-71 to 1974-75	57.14	34.51	28.79	60.60	10.57
1975-76 to 1978-79	49.32	34.17	27.83	67.67	4.43
			Private Limited Companies		
1960-61 to 1964-65	31.70	17.97	35.35	55.39	9.24
1965-66 to 1969-70	38.14	21.00	30.84	60.57	8.56
1970-71 to 1974-75	49.47	28.66	22.42	63.86	13.69
1975-76 to 1978-79	47.61	31.78	12.49	87.61	0.52

companies it has risen from 17 per cent to 32 per cent. The savings growth appears to be faster in private limited companies.

Among the three components of corporate savings, namely, (1) retained profits, (2) depreciation provision, and (3) provision for development rebate or investment allowance reserve (referred to as tax incentive savings), over 60 per cent of total corporate savings are accounted by depreciation provision and 30 per cent by retained profits. Tax incentive savings account for about 10 per cent.

2. The Sample

A sample of about 117 companies has been selected from among the population of all the non-government public limited companies whose paid-up-capital is above Rs 50 lakhs. According to a list prepared by the Company Law Board there were about 1133 such companies in India during 1978, the latest year for which such list is available. Thus, the population considered for the purpose is somewhat narrower than RBI population whose sample consists of both public as well as private limited companies with paid-up capital Rs 5 lakh and above. Since our objective is to study the impact of some firm-specific characteristics on saving effort, we attempted to select the sample in a stratified manner. Thus, the 1133 companies were first divided and sub-divided according to the following characteristics:

(i) Manufacturing and non-manufacturing.

(ii) Relatively older and relatively new, on the basis of their year of registration. (The dividing point considered is 1960).

(iii) The size-group (in terms of paid-up capital) to which a company belongs to.

The population divisions and the corresponding sample number of companies are given in Table A2. The sample companies were selected from respective group populations in proportion to their shares of total paid-up capital. However, for the paid-up-capital size group of above Rs 20 crore, we attempted to include all the companies in the populations subject to the availability of information.

For each of the sample companies, required data were gathered for a twenty-year period, 1960-61 to 1979-80, from the Bombay Stock Exchange Directory and annual reports consisting of balance sheets and profit and loss accounts. Information on as many as 33 items were collected. The list of items and the derivation of required variable from them are given in the appendix.

The sample, thus, not only allows time-series analysis of fairly homogenous groups of companies, (homigenous with respect to the type and size of paid-up capital) but also facilitates seperate studies for relatively order and newer companies.

TABLE A2

Distribution of Sample Companies

	Groups	Total number of companies	Sample number of companies
1.	Manufacturing, regd. before 1960	575	61
	Paid-up capital size (Rs 0.5 - 1.0 cr.)	250	25
	Paid-up capital size (Rs 1 - 5 cr.)	255	25
	Paid-up capital size (Rs 5 - 10 cr.)	48	5
	Paid-up capital size (Rs 10 - 20 cr.)	15	1
	Paid-up capital size (above Rs 20 cr.)	6	5
2.	Manufacturing, regd. after 1960	400	41
	Paid-up capital (Rs 0.5 - 1.0 cr.)	221	22
	Paid-up capital (Rs 1 - 5 cr.)	152	16
	Paid-up capital (Rs 5 - 10 cr.)	22	2
	Paid-up capital (Rs 10 - 20 cr.)	3	1
	Paid-up capital (above Rs 20 cr.)	2	-
3.	Non-manufacturing, regd. before 1960	95	9
4.	Non-manufacturing, regd. after 1960	63	6
	TOTAL	1133	117

3. The Pattern of Savings

Table A3 provides some preliminary answers. It presents the 5-year average rates of savings in terms of paid-up capital as well as in terms of gross cash-flows. The average savings rate for the sample companies as a whole over the 30-year period is 41 per cent in terms of paid-up capital and around 63 per cent in terms of gross cash-flow. The savings effort does not seem to differ much over the last 20 years. Between 'old' and 'new' companies, the former's savings rate, understandably, is far higher than the latter. The saving effort seems to differ significantly between manufacturing and non-manufacturing groups, the average savings rate of the latter being higher at 75 per cent than the former.

Analysis of the savings rates (in terms of cash-flows as well as capital) between different size-groups of paid-up capital reveals the following (Table 5).

Among the manufacturing companies (old) the savings rate between the five size groups, varies from 52 per cent to 63 per cent in terms of cash-flow. The sample provides no evidence for the contention that larger companies save at higher rates than smaller ones. But there is a strong evidence that older companies are capable of higher saving generation. Further, the saving rate is consistently higher for the non-manufacturing companies than for those in the manufacturing sector.

TABLE A3

Trends in Corporate Savings Rates, 1960-61 to 1979-80 Based on Our Sample

	Savings as Percentage of Paid-up Capital					Savings as Percentage of Cash-Flow				
	1960-61 to 1979-80	1960-61 to 1964-65	1965-66 to 1969-70	1970-71 to 1974-75	1975-76 to 1979-80	1960-61 to 1979-80	1960-61 to 1964-65	1965-66 to 1969-70	1970-71 to 1974-75	1975-76 to 1979-80
All companies	41.43	33.18	37.82	46.95	47.78	63.36	60.42	64.38	67.65	61.00
Manufacturing (old)	311.13	169.41	353.98	414.87	306.35	63.03	65.97	60.00	57.29	68.68
Paid-up capital size-groups (Rs. crore)										
0.5 - 1	33.54	32.62	27.48	30.41	43.65	60.26	59.69	64.48	60.07	56.82
1 - 5	34.22	26.35	35.68	34.57	40.29	54.33	53.01	53.68	55.85	54.78
5 -10	53.84	21.40	65.55	70.10	58.32	59.91	65.50	72.21	47.69	54.25
10 -20	118.99	46.00	186.97	231.20	118.22	52.04	39.97	66.23	57.70	44.24
20 - above	43.93	43.04	38.20	48.59	45.88	62.74	64.74	66.27	56.31	63.65
Manufacturing (new)	120.79	7.76	43.83	176.30	255.06	51.41	6.74	55.58	73.26	70.04
Paid-up capital size-groups (Rs. crore)										
0.5-- 1	23.17	2.00	12.79	27.43	29.30	39.33	25.56	34.40	51.87	45.49
1 - 5	36.23	2.50	12.10	51.41	45.17	38.89	16.09	48.51	40.74	50.23
5 -10	55.81	0	18.94	97.45	51.05	32.66	0	10.05	41.95	45.98
10 -20	125.54	0	0	0	125.54	43.64	0	0	0	43.66
Non-manufacturing (old)	48.96	23.43	37.55	57.39	77.48	74.63	67.47	80.79	74.15	75.51
Non-manufacturing (new)	20.06	13.00	20.81	15.20	31.23	26.28	25.05	25.73	26.31	28.01

Comparison of the overall rates of saving between our sample companies and RBI sample comparison would be interesting as the population used to draw our sample can be regarded as a subset of the population of companies from which RBI sample is drawn. The latter represents all companies with paid-up capital ranging from Rs 5 lakh and above whereas our sample represents companies with paid-up capital ranging from Rs 50 lakh and above. If one subscribes to the view that larger companies save more, than one expects higher rates of saving for our sample compared to the RBI sample (for comparable time period). Comparing Tables A1 and A3 one finds fairly strong evidence for the above view. The saving rates of RBI sample companies at around 52 per cent in terms of cash-flow and at around 30 per cent itemsof paid-up capital are definitely lower to the savings rates of our sample companies which are 63 per cent, and 41 per cent respectively. However, it should be noted that within our sample, the savings efforts between different size groups do not differ so much as to support this hypothesis.

(...Contd.)

List of Items Collected for Each of the Sample Companies and Derivation of the Variables from Them

A. TOTAL ASSETS
   1. Current assets
      (i) misc. current assets
      (ii) inventory
   2. Fixed assets (net)
      (i) gross block
      (ii) depreciation

B. TOTAL LIABILITIES
   1. Current liabilities
      (i) loans and advances
      (ii) provisions
         (a) taxation
         (b) divisions
      (iii) misc. current liabilities
   2. Debentures
   3. Long-term loans

C. NET WORTH
   1. Shareholder's capital
      (i) equity
   2. Reserves
      (i) development rebate

D. NET SALES

E. GROSS PROFIT

F. (i) debenture interest
   (ii) other interest
   (iii) depreciation

G. OPERATING NET PROFIT

H. NON-OPERATING SURPLUS OR DEFICIT

I. PROVISION FOR TAXES

J. NET PROFIT

K. (i) equity dividend

L. PROFITS RETAINED

M. DEVELOPMENT REBATE

The Computation of Variables

1. R_t = Profits retained + depreciation + development rebate/equity

2. X = Development rebate/equity

3. FI = Change in the gross block/equity

4. Y = Operating net profit + non-operating surplus (or deficit) + depreciation + development rebate/equity.

5. D = Equity dividend/equity

6. i = Debenture interest + other interest/ debenture + long-term + loans and advances

7. SLS = Net sales/equity

8. K = Gross block

9. INV = Inventory/equity.

10 $\Pi = 1-t$ t = [illegible]

11 $\Theta = 1/(1-td)$ td = [illegible]

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