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TAXATION AND CORPORATE DIVIDEND BEHAVIOR IN INDIA

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Acknowledgements.

This is the second of the two studies I completed during my visit to the Economic Growth Centre, Yale University. The earlier study, 'Taxation of dividends in India: A review (1947 - 1977)' provides a background of Indian tax law and its development since 1947 with partifular reference to corporate dividend policies. This study is a follow-up and attempts at a quantitative analysis of the tax impact on dividend behaviour.

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Chapter I

INTRODUCTION

Private sector has been playing an important role in Indian economy. Its performance over the last three-and-a-half decades since Independence has been impressive both interms of growth as well as its contribution to the national income. As much as 15 per cent of national income originates in the private organised sector annually. Its annual growth averages to 8 per cent despite two brief recessionary slumps.

The most important organ of production activity in private sector has been joint stock corporation. The modern joint stock corporation, with its capital diffusion and democratic functioning has emerged as the most viable production organ replacing the old Marshallian entreprenuer. Private corporations have been dominating the Indian economic scene for quite some time now. Their growth in terms of capital, though not in numbers, has been steadily increasing. Nearly two-thirds of total capital in the private sector is in the hands of corporations and roughly three-fourths of the output generated in the private sector is by corporations. Their contributions to total savings, capital formation as well as to employment in the economy are by no means negligible.

The mixed economic frame of Indian planning however, assigns only a limited role for private sector, and as such, the size and scope of private corporate activity are constantly monitored by various government controls. The Five-year Plans broadly determine the size of additional investment to take place in private sector in accordance with Plan objectives and also with a view to coordinate the private sector activity with that of public sector. While determining the size of additional capacity the plans also indicate the desirable pattern of the allowed capacity among different industries. Apart from the Plan objectives other social and economic considerations such as reduction of economic inequalities, prevention of creation of monopolies and excess profiteering, as well as stabilising the price level also necessitate regulation of private sector.

The tools employed by government in regulating the corporate activity are numerous and varied. While the direct instruments are in the form of licensing, import-export and foreign regulations, the indirect controls are mainly in the form of credit and tax regulations.

Taxation, particularly income taxation, has been a widely preferred instrument employed to control the private corporate sector, not only in India, but in many countries. The subtle and persuasive, rather than coercive, nature of taxation offers a wide scope for effective controlling of the free-enterprise sector without disturbing the institutional set-up.

One difficulty in using income taxation as means of regulating corporate activity however, has been the uncertainity regarding the response. Lack of adequate knowledge regarding the corporate response to such tax measures might lead to frequent experimentation with tax laws. Frequent changes in the tax laws inturn, might evoke public apathy and insufficient response. In order to overcome this difficulty the need to collect as much empirical evidence as possible, regarding the degree of tax responsiveness of the corporate sector, can hardly be overemphasised.

Fortunately, there is no dearth of empirical literature in India dealing with corporate behaviour. But much of the literature is primarily concerned with identifying specific behaviour patterns of corporations under changing market conditions and therefore, abstracted from inquiring into the specific tax effects.[1] Studies that took into account taxes, have not gone beyond determining the incidence and shifting of income taxes.[2] Such polarisation of literature is perhaps, not without reason. Given that the response of corporate sector to taxation depends mainly on the sensitivity of individual

firms to changes in the general market conditions and, their degree of inability to shift away the tax burden, it is only natural to seek information on these aspects and while doing so, concentrating on one aspect at a time. For example, one can expect a high tax response under conditions of zero-shifting and high market sensitivity of firms at least in the short-run. Thus, the information provided by the two groups of studies is certainly of great help to the policy makers. But it would be of greater use if such information is supplemented by some knowledge regarding the extent of market distortions induced by taxes. Studies in this direction are appallingly fewer[3] and necessary academic attention on this aspect is long over due. Alternatively, one might study the resultant total tax response without dissecting into the above component aspects. Such a study may not yield the detailed dissected information, yet, the information will be more complete and useful in designing the tax instruments.

This study is an attempt in this direction. Considering the complex nature of corporate behaviour as a result of numerous management decisions at firm levels and the equally diverse tax structure, the study however, is narrowed down to examine the tax impact on only a few aspects of corporate behaviour. In particular, it concentrates on corporate dividend policies.

Among all the corporate decisions few are as important as dividend decision. Dividend decision has implications not only at the level of the individual firms but at the macro economic level as well. At the individual firm level dividend is the first, if not the only indicator of a firm's performance. Indeed, the culmination of all the objectives of a modern joint stock company is to generate a steady stream of dividends to its shareholders. Higher and regular dividend payments are sure to enhance the market value of the firm and the reputation of its management. On the other hand, such a policy may mean less availability of internal funds and more dependence on external sources for reinvestment and expansion purposes. Thus while determining dividend payments a prudent management strikes a balance between shareholders' preferences and firm's longterm interests while safeguarding their control of the firm.

From the point of view of the economy as a whole, dividend policies of individual firms when added together, play a significant role in determining over-all rates of savings and investment as well as patterns of flow of funds in the economy. Further, dividend policies also have other socio-economic implications. If shareholders are concentrated only in a few income brackets, then changes in the dividend incomes will affect the over-all incomes' distribution as well as factor shares. Abnormally high dividend payments or

abnormally low dividend payments under such conditions might lead to less efficient resource allocation in the economy as a result of changed consumption patterns.

Recognising the importance of dividend policies of corporations and their bearing on the resource allocation and income distribution in the economy, it has been a common practice all over the world to regulate such policies. The objectives of such controls, in general, have been to encourage investment activity, to maintain incomes' equality, to reduce conspicuous consumption by shareholders, to control inflation and to maintain reasonable wage-price stability.

Whatever be the objective, the way taxation is used for the purpose is simply to alter the relative tax burden between dividends and retained profits of companies. For example, by raising the relative burden on dividends they can be made 'costlier' for the firms.[4] The differential tax burden can be injected through numerous elements in a tax system either at company level or at shareholders' level. The extent of such tax differentiation as well as the designing of tax system for the purpose, differ from country to country depending upon their specific needs and circumstances. A study made by Organisation for Economic Cooperation and

Devlopment (OECD)[5] has classified the income tax systems according to method of tax differentiation between dividends and retained profits and identified four broad patterns:

At one extreme lies 'Classical system' under which dividends are taxed twice, once in the hands of companies as profits and later in the hands of shareholders as personal incomes. The differential tax burden can reach a maximum under this system. The Classical system is currently followed by countries such as Australia, Denmark, Luxembourg, Netherlands, Spain, Switzerland, and so on. At the other extreme lies the 'Full Integration system' where the differential tax burden is fully neutralised. This system is as utopian as 'pure competition' and is not practised anywhere though attempts are made in Canada, Greece and West Germany. Between these two extremes a number of systems are possible and exist by partially neutralising the differential tax burden. The partial neutralisation is achieved either at company level or at shareholders' level. At company level it is usually effected by following a 'Split rate system' under which distributed profits are taxed at company tax rates different from undistributed profits. This practice is found in Austria, Finland, West Germany, Japan, and Norway. The 'Imputation system' where a credit is given to shareholders for taxes paid at company level is in force in France, Ireland, Italy, United Kingdom, Belgium, and Canada.

In India also over the last three decades, the income tax system contained several elements of tax differentiation aimed at discouraging excessive dividend payments by public limited companies. Till 1959-60, an 'Imputation' type of income tax system was adopted which was replaced later by 'Classical system' and thereby increasing the over-all tax discrimination against dividends. Also from time to time, additional taxes were levied at company level to accentuate the relative tax burden on dividends.

Except for a few passing remarks and scattered comments,[6] the tax differentiation in the income tax system and its associated effects escaped serious academic attention. Whatever writings exist, concentrated only on the additional differentiation caused by way of the occassional levy of excess dividends taxes. A comprehensive analysis of the income tax system from dividends point of view is long over due. Government's concern for stepping-up of investment and reduction of incomes' inequality is obvious through measures such as excess dividends taxes, discrimination against unearned incomes, or granting tax deductions to dividend incomes and so on. However, such peacemeal attempts might be less effective compared to a longterm consistent tax policy.

Also it should be noted that dividend regulations are not without limitations.[7] It is well-known that investment effort is also a function of demand for it. In the absence of sufficient demand for new investment, supply side reduction of cost of internal financing will merely result either in a change of pattern of financing through substitution of external sources by internal savings, or in the absence of scope for such substitution, will result in idle holding of funds. Accumulation of idle funds in the hands of a few firms may lead to monopolies and concentration of economic power.

Further, the contention that dividend restraints reduce inflationary forces is based upon the assumption that dividend receivers are concentrated only in top few income brackets, which is not always true. Even if dividend receivers belong to rich income classes it is doubtful that their dividend incomes are completely frittered away in conspicuous consumption. On the contrary, a large portion of dividend incomes might flow back into capital market as new equity and in more efficient directions. Under such conditions dividend regulations will restrict the freedom of investors. This also might lead to a situation where new fast-growing firms are starved of funds.

Furthermore, there is another danger involved, particularly, when such restraints are sought through increasing the tax burden on dividends. Managements of firms, instead of reducing dividends, might actually start paying higher gross dividends to maintain the

net dividend levels which is the very opposite of the objective sought.

In view of these limitaions careful administration of this medicine is essential. It also means that even if the creation of tax differential is largely unintentional and only a by-product of a particular tax system designed on the basis of various other considerations such as fuller exploitation of taxable capacity, maintenance of tax equity, keeping the system simple and so on, the economic implications of such differentiation cannot be overlooked.

The present time-series empirical study is an objective attempt to analyse the tax differentiation underlying the Indian income tax system over the last thirty years as well as to measure the response of public limited companies to such differentiation, the purpose being to provide an example of the sensitivity of Indian corporate sector to such regulatory tax measures.

One of the first tasks therefore, is to sift through the numerous tax laws and changes thereof and identify all those elements that caused tax differentiation, which is done in an earlier study.[8] In this study, Chapter II is devoted to assimilate the available thought on the subject into a model of tax impact on dividend behaviour, Chapter

III examines the data base and addresses to various problems associated with the measurement of different variables. Chapter IV analyses the results of empirical testing and finally, Chapter V presents the conclusions.

Notes and References.

1. . A comprehensive review of many of these studies can be found in Krishnamurty, K. and Sastry, D.U. (1975). Investment and financing in the corporate sector in India. Institute of Economic Growth. Tata McGraw-Hill Publishing Co.Ltd. New Delhi.

2. A review of important studies in this area can be found in Rao, V.G. (1980). The corporation income tax in India. Concept Publishing Co. New De

3. Important among these studies are;
   (a) National Council of Applied Economic Research. (1961). Taxation and private investment. New Delhi.
   (b) Somayajulu, V.V. (1975).'Tax incentives and other determinants of corporate investment behaviour in Indian industries, 1965-66 through 1970-71: An econometric analysis.' Paper presented at the Indian Econometric Conference. January.

4. There are of course, other ways of using taxation to affect dividend restrictions. For example, a general increase in the income taxes both at the company as well at the shareholders' levels will have a dampening or 'depressing' effect on dividends as it reduces the base to pay dividends. See, Brittain, J.A. (1966). Corporate dividend policy. Studies in Government Finance. The Brookings Institution. Washington D.C. The severity of the depressing effect depends on the reaction of shareholders as weel as managements. Such a move on the part of government may or may not result in dividend restraints but will be certainly a blow to the reinvestment efforts by firms. The blow will be severe if the scope for dividend reduction is little.

5. Organisation for Economic Cooperation and Development. (1973). Company tax systems in OECD member countries. paris. Also see, International Bureau of Fiscal Documentation. (1972). 'A comparative analysis of Classical, Dual rate, and Imputation tax systems in Belgium, France, Germany, Italy, the Netherlands and United Kingdom'. European Taxation. May-June. Amsterdam.

6. See,
   (a) Parekh, H.T. (1958). The future of joint-stock enterprise in India. Jaico Publishing House. Bombay.
   (b) Das,N.(1962). Industrial enterprises in India. Orient Longman Bombay.
   (c) Pai, H.R. (ed.) (1968). Taxation in India - A commentary. Popular Prakashan. Bombay.

7. See,
   (a) Royal Commission on Taxation of Profits and Income. (1955). Final Report. HMSO. London. pp. 155-160 and pp.384-390.
   (b) Fabian Research Group. (1952). Taxation today. Fabian Research Series No.149. London.
   (c) Rubner, A.C. (1964). 'The irrelevancy of British differential profits tax'. Economic Journal. 74. pp.347-59.
   (d) Institute of Fiscal Administration. (1970). The multiple burden on dividends and shares by taxation on income and capital of both corporations and shareholders. Amsterdam.
   (e) Committee on Rationalisation and Simplification of the Tax Structure. (1967). Final Report. Government of India. New Delhi. pp.19-20.

8. Sarma, J V M (1982). Taxation of dividends in India: A review, 1947-1977. Discussion Paper n0. Economic Growth Centre, Yale University.

Chapter II

THEORETICAL FRAME, DATA AND MEASUREMENT OF VARIABLES.

In this chapter we shall discuss the methodology and make preparations for a quantitative analysis of tax impact on dividends. In section 1, we shall recapitulate the theoretical aspects reviewed in the previous chapter, by formally stating a model of dividend behaviour. In section 2, we shall extend the model to take into account the shelter effect of personal taxes, and interpret the model in the Indian context. In section 3, we shall consider some of the financial factors to be included in the model. And we shall devote section 4, to the measurement of the variables involved.

1. The model.

It is now clear that the starting point in analysing dividend behaviour is not the desired dividend equation but an objective function representing a firm's preferences regarding dividend-retention mix. The objective function is closely related to firm's main motives. Untill recently, the sole motive of an entrepreneurial activity was regarded as maximisation of rate of return on capital. But with the increasing dominance of joint-stock corporations and the associated characteristic of seperation of ownership and control, it is now fairly recognized that there exist other equally important motives, such as sales maximisation, expansion of business and thereby increasing the market value of the firm.[1] The later objectives are also in line with the managing agency system of operation which is identified as a characteristic feature of Indian companies.[2] The seperation of ownership and control also means that the objectives and preferences of a firm's management need not coincide with those of its shareholders.

Starting from the shareholders' side, we know that their preferences depend mainly on their income level and their degree of understanding of corporate stock-dealings and associated tax implications. For example, shareholders belonging to lower and middle income groups prefer a regular flow of dividends in order to supplement their other incomes, if any. Firm's size, profitability or growth may not be of crucial interest to them. On the other, shareholders belonging to richer classes may not be so much dependent on dividend incomes, nevertheless, they may want dividends for reinvesting in other securities and diversifying their assets. In their case regularity may be of less importance. However, a section of the rich shareholders who speculate in stock transactions may prefer stable dividends in so far as appreciation of share prices depends upon such regularity.

The reactions of shareholders to tax changes may also be varied. An increase in the personal income tax rate might

force those belonging to lower income groups to prefer more 'gross'dividends to cover the tax increase. This preference for higher 'gross' dividends is irrespective of their knowledge of tax tax shelter provided by a lower capital gains tax rate since their 'waiting' capacity is low. On the other, shareholders belonging to richer income groups might seek to avoid their personal income tax by preferring lower dividends. Such preferences, naturally depend upon the condition that the capital gains tax rate should be 'sufficiently' lower than personal income tax rate.

We may generalise the behaviour of shareholders as that they prefer stable, if not growing dividend rates, and that the effect of taxes on their preferences depend upon their average level of incomes. If the shareholders mainly belong to lower and middle income groups, then a rise in the personal income tax might not alter their preferences for 'net' dividends, and if they mainly belong to richer classes then the effect would be different.

In describing the managements' behaviour also, we can conceptually distinguish between two types; a) a relatively 'passive' type and, b) a relatively 'active' (managing agency) type. (Such a distinction, it should be noted, is in no way a reflection on their efficiency.) In situations where management is extremely 'passive' it completely identifies its motives with those of the shareholders, and strives to ensure stable growing dividends. However, even such a management also cannot ignore firm's long term needs, such as investment demand, liquidity needs and so on, which require sufficient profit retentions. The stability requirement makes them to be careful in revising the dividend rate. In this case, profit retentions also act as a cushion against dividend fluctuations. The other situation is that in which the management is more 'dominant' and active, and is mainly concerned with maximisation of its own credibility. Dividend policy in this case is mainly aimed at increasing the market value of the firm as well as the market price of shares. While even such a management cannot completely ignore shareholders' preferences because to do so would be detrimental to their own credibility, the tendency however, would be to search for possible excuses to reduce, or atleast not to increase, dividends. High tax rates on distributions may be one such excuse. Even the management might convince shareholders regarding the tax 'shelter' benefits and persuade them to accept dividend cuts. Further, the 'clientele' effect[3], namely, that in the long-run a firm attracts (or retains) only those shareholders who prefer its dividend pay-outs, would be higher in the case of firms controlled by such managements. All these can be expected to result in a higher response to tax changes.

Thus it can be easily seen that except in the rarest situation where the management of a firm is extremely passive and its shareholders solely belong to rich income classes and also are not interested in share transactions, in all other management-shareholder situations taxes can be expected to effect the dividend preferences. In actual practice, we reasonably assume that managements are neither extremely passive nor extremely 'dominant' and shareholders are neither rich and indulgent nor precariously dependent on dividend incomes alone, but contain all the elements in different combinations.

Following Moerland and King[4], consider a typical firm having a map of indifference dividend preference curves, each indicating a unique level of 'utility' obtained by alternative combinations of net dividends and net retained profits. The dividend preference function can be denoted as

$$U = F(D_n, R) \qquad -(4.1).$$

where D_n and R are net of all taxes at all levels. The utility level as given by each curve can be viewed as monotonically related to the motivations of management which also take into account the shareholders' preferences. The shape of the utility curves might be an outcome of a process of weighting of their relative prefetences, as well as a result of a number of factors influencing such preferences.

However, following Denny[5], a minimum set of reasonable conditions can be imposed. They are; a) monotonicity, and b) quasi-concavity. Condition (a) ensures that utility derived from higher levels of D_n and R is greater than that from lower levels. Condition (b) ensures that the relative marginal utility declines as the firm moves along the curve.

By imposing a further condition of homotheticity, Denny derived a generalised quadratic form for production functions, which was later used by King to describe his 'indirect managerial function' of dividends and retained profits. The function is

$$U = [\sum_i \sum_j \alpha_{ij} X_i^{\beta\gamma} X_j^{\beta(1-\gamma)}]^{1/\beta} \qquad -(4.2)$$

where i and j=d and r, the subscripts for D_n and R respectively, and $X_d = D_n$ and $X_r = R$. The distribution parameters $\alpha_{ij} \geq 0$, and the substitution parameters $\beta \leq 1$ and $0 \leq \gamma \leq 1$.

In order to find the tax effects, we first assume that the specification of the dividend preference function is independent of taxes, and then introduce the tax elements via a budget constraint. The analytical strategy is simillar to consumets' demand theory.

The constraint in this case is firm's total income net of expenses and interest on debt. Depreciation for the time being can be assumed as 'economic' depreciation and is exactly equal to year-to-year capital consumption so that it can be treated as an expenditure item. It is also useful to deduct dividends paid to preference shareholders, as they can neither be regarded as equity dividends, nor can be treated as interest on debt since their payment is conditional on existence of sufficient profits base. Certain types of preference shares also lay claims on future profits if current profits are not sufficient.

Thus we define the base for dividend payments as total profits net of interest and preference dividends. There is also the question of compulsory provisions specified by company law and tax law. Though these provisions are compulsory the marginal utility of additional non-compulsory retentions very much depend upon the amount of compulsory provisions. Therefore, it is essential to include all those provisions.

The profit allocation function or the budget constraint can be written as

$$Y = D_n + R + T \qquad -(4.3)$$

where Y denote the total profits base, D_n and R, net dividends and retentions as defined, and Y, the total tax liability as a result of income taxes both at the company level as well as at shareholders level. Alternatively, it can be written as

$$Y = D_n p_d + R\ p_r \qquad -(4.4)$$

by defining the 'tax prices' p_d as D_g/D_n and p_r as R_g/R, where D_g and R_g are 'gross' devidends and 'gross' retentions, respectively. For example, D_g denotes the amount of profits to be allocated to realise one rupee of net dividends, D_n. The prices, ofcourse, depend upon the prevailing type of tax system and the tax rates.

For constrained maximisation, define the Lagrange function, L as

$$L = U + \mu(Y - D_n p_d - R\ p_r) \qquad -(4.5).$$

The first order conditions,

$$\partial L/\partial D_n = U'_d - \mu p_d = 0 \qquad -(4.6)$$

$$\partial L/\partial R = U'_r - \mu p_r = 0 \qquad -(4.7)$$

$$\partial L/\partial \mu = Y - D_n p_d - R\ p_r = 0 \qquad -(4.8)$$

yield the equation,

$$U'_d/U'_r = p_d/p_r \quad , \text{where} \qquad -(4.9)$$

$$U'_i = \frac{1}{\beta} U^{\frac{1}{\beta}-1} \{\alpha_{ii} \beta X_i^{\beta-1} + \alpha_{ij} \beta\gamma X_i^{\beta\gamma-1} X_j^{\beta(1-\gamma)} + \alpha_{ij} \beta(1-\gamma) X_i^{-\beta\gamma} X_j^{\beta\gamma}\} \qquad -(4.6).$$

The only way for a solution is to impose another restriction on the shape of the objective function namely, that $\alpha_{ij} = 0$ when $i \neq j$, so that the cross-terms will disappear, and the function degenerates into a CES function. The imposition of this condition is arbitrary, but needed inorder to obtain a manageable solution for D_n.

The first order condition (4.9) so trimmed would be

$$\alpha_{dd}/\alpha_{rr} [D/R]^{\beta-1} = p_d/p_r \qquad -(4.11)$$ [8]

Denoting p_d/p_r as ϕ, $1/(\beta-1)$ as σ, α_{rr}/α_{dd} as A, substituting for R from (4.8), and rearranging terms, the optimal solution for D_n can be obtained as

$$D_n^* = A^{\sigma}\ \phi^{\sigma}/[1 + A^{\sigma} \phi^{\sigma+1}] \ .\ Y/p_r \qquad -(4.12).$$

It can be easily seen that σ denotes the elasticity of substitution between D_n and R. The second order condition requires σ to be negative.[9] The distribution parameter $\beta \to 1$, $\to 0$, or $\to -\infty$ accoding as $\sigma \to -\infty$, $\to -1$, or $\to 0$, and the utility function degenerates into linear, Cobb-Douglas, or Leontief types respectively.

<u>Inter-temporal adjustment.</u>

As we noted above, both shareholders as well as managements seek a regular and less fluctuating dividends which will result in a lagged adjustment of dividends to changing conditions. Two types of the lagged adjustment processes are conceived in the literature; (a) partial adjustment process, and (b) a process of adjustment to 'permanent' levels of factors affecting dividends.

Both the processes adhere to Koyck's distributed lags and the 'lag parameter' can be interpreted in both the ways.[10] However, the difference between the two processes will become apparent when, (i) the lag parameter is different for different independent variables, and (ii) when the dividend function is 'non-linear in parameters' as is the case with our equation (4.12). Estimation with 'permanent income' hypothesis is relatively difficult with only a marginal gain. Probably, for this reason, the favoured process in the literature has been the partial adjustment. The assumption[12] that the partial adjustment is a result of the choice between two alternative actions by the management, namely to deviate or not to deviate from last year's dividends level, the choice being dependent on the relative costs of the two actions.[11]

Following the Feldsteinian convention we write the partial adjustment equation as

$$D_t/D_{t-1} = [\ D_t^*/D_{t-1}\ ]^{\lambda} \qquad -(4.13).$$

2. <u>Effect of individuals' taxes.</u>

We propose to extend the model to take into account the 'tax shelter effect'. It should be noted that dividends determined by (4.12) are net of all taxes including those levied on individuals. We assume that the D_n^* will be grossed-up for individual income taxes, before being paid to shareholders to enable them realise D_n^*. Let a grossing-up factor be p_s such that $D^* = D_n^* p_s$.

Further, the variable ϕ, being the 'tax price ratio' depends upon p_d and p_r, and as D_n^* is net of all taxes, p_d depends upon the rates of individual taxes as well. In particular, p_d can be split into two components; (i) the amount of total gross dividends D_g required to realise one rupee of dividends net of company taxes but gross of shareholders' taxes, denoted as D, and (ii) the amount of D required to make available to shareholders, one rupee of dividends net of all the taxes, denoted as D_n. The latter component, obviously, is the grossing-up factor p_s. In other words,

$$p_d = (D_g/D).\ (D/D_n) = p_e\ p_s. \qquad -(4.14).$$

where the former component is represented as p_e. The grossing-up factor can also be regarded as a link between management and shareholders through which the latter's preferences are fed into the over-all optimal dividend equation. Correct identification of the form of this ratio is essential to enable equation (4.12) to yield 'optimal' dividends. This is one aspect left unclear by the earlier works.

We have noted above that not all the shareholders would prefer higher dividends in situation of rising individual income tax rates unless there is an equivalent rise in the capital gains tax rates. Also as the rate differential increases, more and more shareholders belonging to even middle or lower income brackets may opt for tax shelter. The grossing-up factor relevant to optimal dividends can be obtained as an average preference price ratio, by assuming an objective utility function simillar to the function (4.2), and maximising it subject to shareholders' own constraint specified as

$$D = D_n q_d + C\, q_r \qquad (4.15);$$

where q_d and q_r are 'prices' due to personal income tax and personal capital gains tax respectively, and C, the amount of D prefereed to be realised as capital gains. The constrained maximization yields an optimal function for D_n simmillar to equation (4.12) as

$$D_n = [\, B^{\eta}\delta^{\eta}/(1 + B^{\eta}\delta^{\eta+1})\, q_r].\, D \qquad -(4.16).$$

Therefore, by definition

$$p_s = (1 + B^{\eta}\delta^{\eta+1})\, q_r / B^{\eta}\delta^{\eta} \qquad -(4.17),$$

where B is the ratio of the distribution parameters in the shareholders' preference function analogous to A in (4.12), δ is the shareholders' tax price ratio q_d/q_r, and η is the elasticity parameter analogous to σ in (4.12). Equation (4.17) indicates the preferences of shareholders regarding D_n for given D.

Feeding this information into (4.12) and denoting $\theta = p_s/p_r$, we obtain

$$\phi = \theta\, (1+B^{\eta}\delta^{\eta+1})\, q_r / B^{\eta}\delta^{\eta} \qquad -(4.18),$$

and the optimal function of a firm as

$$D^{*} = \frac{A^{\sigma}\theta^{\sigma}(1+B^{\eta}\delta^{\eta+1})^{\sigma+1}\, q_r^{\sigma+1}}{[(B^{\eta}\delta^{\eta})^{\sigma+1} + A^{\sigma}\theta^{\sigma+1}(1+B^{\eta}\delta^{\eta+1})^{\sigma+1} q_r^{\sigma+1}]}\; \frac{Y}{p_r} \qquad -(4.19).$$

From (4.19) it can easily be seen that the target pay-out ratio in Lintner model is not a constant, but varies with the tax factors; θ, δ, q_r, and p_r. Also the tax effect is split into two parts analogous to 'income' and 'substitution' effects in consumer demand theory. While θ and δ represent the 'substitution' effects of the relative 'tax prices', q_r and p_r represent the income effects respectively at shareholders' level and company level.

The advantage of the extended model is that it not only takes account of the tax differentials both at company level as well as at shareholders' level, but it also allows for the seperation of the two influences in a flexible way. In doing so it explicitly allows for the response of management to personal taxes to be exactly same as the combined response of shareholders.

Interpretation of the model in the Indian context.

The optimal dividend equation can be interpreted interms of different tax systems that prevailed in India as follows. As we noted in chapter II the system, prior to 1959-60 was of 'Imputation' type which was later changed to 'Classical' type. Added to these broad systems were the occasional dividend taxes. For the purpose of interpreting the model we shall leave-out the details and consider only the main features.

Under the 'Imputation' system, let t_a and t_b be the income tax and super tax on a company, and t_i and t_g be the personal income tax on dividends and an equivalent tax on capital gains respectively. As a result of 'grossing-up' practive, the personal income tax liability on dividends received by the shareholders would be $(t_i - t_a)/(1 - t_a)$. Further, let t_d be an additional tax on dividend distributions at the company level.[12]

The tax prices can be determined as follows; Consider the over-all budget constraint of a company as

$$Y = D_g + R_g \qquad -(4.20),$$

where D_g and R_g are gross profits assumed to have been allocated for dividends and retentions. The constraint can be rewritten interms of net dividends and the retentions as

$$Y = \frac{D}{(1-t_a-t_b)(1-t_d)} + \frac{R}{(1-t_a-t_b)}$$

or

$$= \frac{D_n \; p_e}{(1-t_a-t_b)(1-t_d)} + \frac{R}{(1-t_a-t_b)} \qquad -(4.21).$$

In a simillar way shareholders' budget constraint would be

$$D = \frac{D_n(1-t_a)}{1-t_i} + \frac{C}{1-t_g} \qquad -(4.22).$$

Comparing these constraints with their counterparts in (4.4) and (4.15), we obtain the 'prices' interms of taxes as

$$p_r = 1/(1-t_a-t_b) \qquad -(4.23)$$

$$p_e = D_g/D = 1/(1-t_a-t_b)(1-t_d) \qquad -(4.24)$$

$$q_d = (1-t_a)/(1-t_i) \qquad -(4.25)$$

$$q_r = 1/(1-t_g) \qquad -(4.26).$$

Further,

$$\theta = 1/(1-t_d) \qquad -(4.27)$$

$$\delta = (1-t_a)(1-t_g)/(1-t_i) \qquad -(4.28)$$

$$p_s = \frac{(1-t_i)^{\eta+1} + B^{\eta}(1-t_a)^{\eta+1}(1-t_g)^{\eta+1}}{B^{\eta}(1-t_g)^{\eta+1}(1-t_a)^{\eta}(1-t_i)} \qquad -(4.29)$$

and,

$$\phi = \frac{(1-t_i)^{\eta+1} + B^{\eta}(1-t_a)^{\eta+1}(1-t_g)^{\eta+1}}{B^{\eta}(1-t_g)^{\eta+1}(1-t_a)^{\eta}\ (1-t_i)\ (1-t_d)} \qquad -(4.30).$$

The optimal dividends equation can be obtained accordingly.

Under the Classical system, the only change required for deriving the dividend equation is in the interpretation of q_d, which now becomes $1/(1-t_i)$. Correspondingly, the term $(1-t_a)$ disappears from the interpretation of δ, p_s, and ϕ.

Further, it is also clear that under both the systems, in the case of no additional tax on dividends ($t_d=0$), p_e would be simply $1/(1-t_a-t_b)$ and θ, the tax differential at the company level will be unity. Thus, under the simple classical system, the only tax differentiation would be through the individuals' taxes as indicated by δ.

Some interesting degenerations of the general form (4.19) can be obtained by assuming unit elasticities of substitution as follows:

Case (i). If $\eta=-1$, then

$$p_s = (B+1)\delta q_r \qquad -(4.31),$$

and therefore,

$$D^* = \frac{A^{\sigma}(B+1)^{\sigma+1}(\theta\delta)^{\sigma}q_r^{\sigma+1}}{1+A^{\sigma}(B+1)^{\sigma+1}(\theta\delta)^{\sigma+1}q_r^{\sigma+1}} \cdot \frac{Y\delta}{p_r} \qquad -(4.32)$$

which is simillar to the CES specification of King.[13] Note that the term δ/p_r is simillar to Feldstein's Π in the sense it represents the value of maximum distributable profits.

Case (ii). (the Cobb-Douglas case.) If $\sigma=-1$, then irrespective of the value of η

$$D^* = (A+1)\theta^{-1} Y\, p_r^{-1}$$

which can also be written as

$$D^* = (A+1)\ (\theta\delta)^{-1}\ Y\ \delta p_r^{-1} \qquad -(4.33)$$

so that it matches with Feldstein's specification with Π.[14]

The equation in case (ii) is a useful linear approximation and can be employed to test a hypothesis that σ is unity. However, the specification is inadequate to estimate the correct value of σ as such, in case of σ being other than unity.

3. Influence of other factors.

The utility function (4.1) as we assumed, is a result of a number of factors analogous to tastes and preferences in consumer demand theory, which are considered to be relatively constant in the short-run. But these factors are less likely to have remained same over the period under study. In anticipation of changes in these factors and their likely influence in altering the shape and position of the objective function, it is necessary to hold them constant by incorporating in the dividend equation to be estimated.

Also as we noted in chapter III, previous empirical evidence regarding the influence of these factors is largely against their influence. Nevertheless, in view of the fresh specification of the model, it will be useful to consider some of the financial variables as possible demand-side factors.

Important among these factors are; 1) firm's investment demand, 2) its capital structure, 3) its liquidity needs, 4) changes in sales, and 5) depreciation.

Throughout the literature on dividend behaviour, investment demand of a firm is considered to be an important factor affecting

affecting dividend payments. Infact, many studies considered dividends and investment decisions as mutually interdependent.

The other of the 'triad' decisions is with respect to the capital structure. Given the demand for new investment, dividend distributions depends upon the decision relating to the extent of internal financing. Out of the three sources of financing new investment namely, retained earnings, new equity issues, and borrowings, it is common knowledge that retained earnings is the cheapest source. At the sametime financing through profit retentions is considered to be a relatively inefficient way. However, a change in the relative capital cost structure might alter the propensity for retentions with its repurcussions on dividends. Therefore, capital structure is an important factor affecting dividends.

Many studies preferred cash-flows to profits net of depreciation as representing firm's capacity to pay dividends. The implied hypothesis is that firms generally consider net profits as 'illusory' and that true capacity also includes the excess of depreciation provision over 'real' depreciation. Such 'excess' is believed to move with depreciation provision since 'real' depreciation is unknown. In a way, drawings from depreciation reserves as well as other reserves such as development rebate reserve, dividend equalisation reserves, to supplement current profits should be regarded as acts on the part of firms to identify their 'permanent' income or 'permanent capacity' to pay dividends. Since the dividend model already has a provision to take into account such 'permanent effects' via partial adjustment, there seems to be little reason to consider such changes in reserves as a factor. However, inclusion of depreciation does no harm to the model except lowering the 'speed of adjustment' parameter.

Another factor expected to influence dividend policies is corporate liquidity. The argument is simillar to that with respect to investment demand.

Finally, changes in sales is sometimes included in dividend models to represent the anticipated working capital needs as suggested by Darling. An alternative rationale suggested by Brittain is that rapid gains in earnings as indicated by sales change might make firms more cautious and adopt more conservative dividend policies. Thus, higher sales change may slow down the adjustment of actual to expected dividends. If this is so, then inclusion of this variable should be regarded as essentially to make the 'speed of adjustment' stable.

However, the expected negative association between dividends and sales change seems to be more plausible if the factor is interpreted as a proxy for working capital needs.

4. Data and measurement of variables.

That brings us to the actual measurement of tax variables as well as others in the proposed dividend equation. First let us consider the tax variables.

Tax variables.

The tax variables in the dividend model are $\theta, \delta, \phi, p_r$, and q_r, which are expressions involving different taxes both at the company aswell as shareholders, and each tax being represented by a single rate. In the real world however, the liability with respect to any tax being dependent upon a single rate is indeed rare. The rate structure of a tax is more likely to be such that different parts of the tax base is taxed at different rates.

This presents the problem of representing the complex structure of each tax by a single rate. Obviously, the combined rate should be a weighted average of different rates, with weights representing different portions of the tax base.

The question is while averaging, whether one should consider changes in the base structure, or, assume a constant base structure. The former yields effective rates representing the true tax liability. Hoever, the latter method yields average rates which reflect tax policy changes more faithfully than effective rates. As we are interested in measuring the impact of tax policy changes, the logical choice seem to be to consder rates which are independent of tax base changes. But care must be taken in choosing the weights to be as 'normal' as possible.

In the case of company profits taxes this would mean that we consider statutory rates relevant to Indian public limited companies.

In the case of company dividend taxes, as we know, for most of the time, dividends exceeding certain statutory limits only were liable to tax. In certain years more than one limit were specified to charge excess dividends at progressively higher rates. In considering the dividend taxes, we make an assumption that dividends would have exceeded the statutory limits but for the tax. The excess liability thus computed, is evenly spread over all the dividends so that the resultant average dividend tax rate is compatible with

our definition of t_d. Also the dividend tax policy under 'penal' tax was to give a rebate on profits taxes. This can be regarded as equivalent to charging company profits at a rate lower than the current income tax rate and then subjecting to the 'excess' tax when the dividends exceeded the limit. Accordingly the rates t_a and t_b for those years are lowered by 6.25 per cent and the same is regarded as the average dividend tax rate.

In the case of personal income tax, information regarding the weight structure is culled-out from <u>All India Income tax Revenue Statistics</u> published annually by the Central Board of Direct Taxes. Fortunately there is no significant change in the weight structure over the study period. The weights are determined on the basis of shares of dividend incomes falling in different total income brackets. The implied objective is to give higher weights to statutory rates applicable to shareholders receiving larger dividend incomes. The weights are averaged over the middle 10 years of the study period, and these weights are used to combine the statutory average unearned income tax rates on different income groups. An additional assumption involved is that total incomes of shareholders are wholly unearned, which is rather unrealistic. But the loss in accuracy is expected to be far less compared to the additional computational burden involved.

To further reduce the computational burden we exclude the capital gains tax. First of all, the tax itself is not on the same footing as income or dividend taxes. Making it compatible with our model involves assumptions regarding expected rates of return on capital gains and resultant average tax liability. Due to this, as well as due to various computational complications it seems wise to keep away from capital gains tax. We, however, assume that the 'equivalent' tax rate on capital gains is sufficiently lower than the personal dividend income tax rate.

The tax rates are shown in table 4.1 and tax variables computed are shown in table 4.2. The details such as average personal income tax rates by income size, and weights are shown in the Appendix.

__Financial variables.__

The main source of data relied upon to compute the dependent variable as well as other financial variables is the Reserve Bank of India (RBI) publication, __Financial Statistics of Joint Stock Companies in India__. This publication contains data relating to a sample of public limited companies based on their annual reports. The sample companies are those with/above [paid-up capital] Rs. 5 lakhs. The RBI sample selection is guided by the 'twin objectives of

Table 4.1 Tak rates to be used in the empirical analysis.

year	corporation income tax	corporation super tax	excess dividends tax	personal income ta
1947.	25.000	12.500	6.2500	37.910
1948.	25.000	12.500	6.2500	40.910
1949.	25.000	12.500	6.2500	39.240
1950.	20.000	15.625	6.2500	35.060
1951.	20.000	17.188	6.2500	35.710
1952.	20.000	17.188	6.2500	35.710
1953.	20.000	17.188	6.2500	35.710
1954.	20.000	17.188	6.2500	35.710
1955.	20.000	17.188	6.2500	39.390
1956.	26.250	17.188	7.5000	35.600
1957.	31.500	20.000	7.8000	40.980
1958.	31.500	20.000	7.8000	40.980
1959.	31.500	20.000	.0	40.980
1960.	20.000	25.000	.0	40.980
1961.	20.000	25.000	.0	40.980
1962.	25.000	25.000	.0	40.710
1963.	25.000	25.000	.0	42.260
1964.	25.000	25.000	7.5000	41.650
1965.	50.000	.0	7.5000	38.650
1966.	50.000	.0	7.5000	52.230
1967.	50.000	.0	7.5000	52.230
1968.	50.000	.0	7.5000	41.280
1969.	50.000	.0	.0	36.270
1970.	50.000	.0	.0	37.120
1971.	55.000	.0	.0	36.500
1972.	56.375	.0	.0	41.360
1973.	57.750	.0	.0	41.360
1974.	57.750	.0	.0	41.360
1975.	57.750	.0	.0	36.430
1976.	57.750	.0	.0	34.540
1977.	57.750	.0	.0	30.010

Table 4.2 Tax variables involved in the model.

year	tax differential			tax depression
	at company level (θ)	at shareholder level (δ)	total ($\theta\delta$)	
1951.	1.0692	1.2400	1.3258	.50720
1952.	1.0692	1.2400	1.3258	.50720
1953.	1.0692	1.2400	1.3258	.50720
1954.	1.0692	1.2400	1.3258	.50720
1955.	1.0692	1.3200	1.4113	.47650
1956.	1.0795	1.1400	1.2307	.49840
1957.	1.0825	1.1600	1.2557	.41850
1958.	1.0825	1.1600	1.2557	.41850
1959.	1.0000	1.1600	1.1600	.41850
1960.	1.0000	1.6900	1.6900	[illegible]
1961.	1.0000	1.6900	1.6900	.26650
1962.	1.0000	1.6800	1.6800	.29760
1963.	1.0000	1.7300	1.7300	.28900
1964.	1.0800	1.7100	1.8468	.29240
1965.	1.0800	1.6300	1.7604	.30670
1966.	1.0800	2.0900	2.2578	.23920
1967.	1.0800	2.0900	2.2578	.23920
1968.	1.0800	1.7000	1.8360	.29410
1969.	1.0000	1.5700	1.5700	.31850
1970.	1.0000	1.5900	1.5900	.31850
1971.	1.0000	1.5700	1.5700	.28690
1972.	1.0000	1.7000	1.7000	.25690
1973.	1.0000	1.7000	1.7000	.24820
1974.	1.0000	1.7000	1.7000	.24820
1975.	1.0000	1.5700	1.5700	.26870
1976.	1.0000	1.5300	1.5300	.26870
1977.	1.0000	1.4300	1.4300	.26870

maximising industry-wise, the coverage in terms of paid-up capital and ensuring inclusion of as many representative units as possible from various industries'. Further, the sample is revised every five years with a view to improve the coverage and representative character of the selected companies in the context of the expanding corporate sector.

For an aggregate time-series analysis of company sector in India we consider that the RBI sample is suitable in the sense that it is sufficiently large and also the sample composition of the companies is revised every five years to retain its representative character over time. On the other, samples which retain same companies throughout the period might loose their representative character after some years, since new companies which might have started in the intermediary years are not represented. Further, the RBI sample has one feature which makes it particularly suitable for our purpose: Though the sample takes into account the changing composition of the population over time, the sample is revised only in five-year intervals. Thus, within a five-year period, the data related to the same group of companies. This feature is favourable to our study which deals with equations containing lagged variables. For those years which mark the revision in the sample, data is reported for the old sample as well as for the new sample, making it easier to connect the sample data.

The RBI sample is not devoid of problems. Most important is that the accounting years vary among the sample companies. But a number of empirical studies, partifularly, Krishnamurty and Sastry[15] shows that it may not significantly affect the results. Secondly, no distinction is made in the sample between profit-making and loss-making companies. This also should not bother us, as we seek to study the behaviour of an average company representing all companies irrespective of whether they are profit-making or not.

The variables to be used in our analysis and their measurement is given below:

1. Dividends: Dividends on ordinary shares or equity shares.
2. Profits: Gross cash-flow or gross profits derived as the sum of profits before tax and depreciation provision.
3. Investment demand: Change in the gross fixed assets + change in the inventory investment.
4. Capital structure: Debt-equity ratio obtained as a ratio of the sum of borrowings, trade dues and current liabilities, and miscellaneous non-current liabilities.to total liabi
5. Corporate liquidity: Ratio of current assets to current liabiliti (Ratio of sum of cash and bank balances, investments, loans and advances, advance payment of taxes, to the sum of tax provision and trade dues and other current liabilities.)
6. Sales change: Change in the net sales.

All the non-ratio variables are scaled down to paid-up capital to allow for the compatibility between different five-year periods in which the sample was revised and thereby to reduce the heteroschedasticity. Paid-up capital is chosen to scale the variables because it is the sampling parameter of the RBI sample.

Conclusion.

In this chapter, we summarised the existing models of dividend behaviour and extended to seperate the effects of personal taxes. We have also considered various problems associated with the data and measurement of variables. In the following chapters, we propose to estimate relevant versions of the model, and use the estimated parameters to quantify the tax impact on dividend behaviour.

Notes and References.

1. Marris, R.L.(1964). The economic theory of managerial capitalism. Macmillan Co, London.

2. Ambirajan, S.(1964). The taxation of corporate income in India. Asia Publishing House, Bombay.

3. see, Miller, M.H., and Modigliani,F.(1961)'Dividend policy,growth, and the valuation of shares'. Journal of Business, vol.34,pp.411-33.

4. Moerland,P.W.(1975).Optimal Dividend policy and taxes: Another approach. Institute for Fiscal Studies-Discussion paper NO.7502 Series on public economics. Erasmus University, Rotterdam.

5. Denny,M.(1974).'The relationship between functional forms of the production system'. Canadian Journal of Economics. Vol.7. pp.21-31.

8. The steps are as follows.

Substituting for R, the equation will be

$$D_n^{\beta-1} = \frac{\alpha_{rr}\, p_d}{\alpha_{dd}\, p_r} \left[\frac{Y - D_n p_d}{p_r} \right]^{\beta-1}$$

which can be written interms of A, ϕ, and σ, as

$$D_n = A^{\sigma}\phi^{\sigma}[(Y/p_r) - D_n\phi] \text{ , and therefore,}$$

$$D_n = A^{\sigma}\phi^{\sigma}[1 + A^{\sigma}\phi^{\sigma+1}]\ Y/p_r.$$

9. Note that the elasticity of substitution of a CES function is $1/(1-\beta$ which is positive whereas our $\sigma = 1/(\beta-1)$, and therefore is negative.

10. Johnston,J.(1972). Econometric methods. (2nd ed).McGraw-Hill.

11. Lintner,J.(1956).'Distributions of incomes of corporations among dividends,retained earnings and taxes'.American Economic Review. VOL.46 pp.97-113.

Grilliches,Z.(1967).'Distributed lags: Asurvey',Econometrica, VOL.35, January, pp.16-49.

12. The rate t_g is not exactly equals the capital gains tax rate. Instead it should be interpreted as a tax rate on discounted value of the stream of returns attributable to profit savings. Also the rate t_d should not be mistaken to be the 'excess dividends' rate as it existed in India. Assuming that D exceeds the statutory limit t_d is the additional tax liability per a rupee of D.

13. See, King,M.(1977). Public policy and the corporation.Chapman andHall, London, p.179

14. Feldstein,M.S.(1970).'Corporate taxation and dividend behaviour'. Review of Economic Studies. vol.37. pp.56-72.

15. Krishnamurty,K, and Sastry,D.U.(1971). Some aspects of corporate behaviour in India.' Indian Economic Review. October, 1971.

Appendix 1

Average personal income tax rates on dividend incomes at different levels of total unearned incomes, 1947 - 1977.

	upper limit of the income class(Rs '000)	1947-48	1948-49	1949-50
1.	5.0000	4.3800	4.3800	3.2800
2.	7.5000	7.0800	7.0800	5.8300
3.	10.000	8.4400	8.4400	7.1000
4.	12.500	11.120	11.120	10.060
5.	15.000	12.920	12.920	12.030
6.	20.000	17.500	17.500	15.270
7.	25.000	20.250	20.250	17.220
8.	30.000	25.210	25.210	22.680
9.	40.000	32.580	31.410	29.510
10.	50.000	37.940	37.000	35.410
11.	60.000	42.550	41.520	40.150
12.	70.000	46.740	45.410	44.240
13.	100.00	57.410	55.220	46.900
14.	200.00	76.670	72.140	67.980
15.	300.00	83.400	78.820	76.050
16.	400.00	86.770	82.940	80.470
17.	500.00	88.790	85.730	100.00

	1951-55	1955-56	1956-57	1957-62
1.	3.4000	2.9500	2.9500	.84000
2.	6.1300	5.8000	5.8000	2.5600
3.	7.4700	8.0400	8.0400	4.6200
4.	9.9000	10.700	10.700	6.3400
5.	11.540	12.500	12.470	8.0800
6.	15.220	15.900	15.900	11.460
7.	17.420	19.290	19.290	16.370
8.	22.180	23.730	23.730	21.640
9.	28.120	29.290	29.280	29.730
10.	32.990	35.200	35.240	36.980
11.	37.340	40.300	40.300	42.820
12.	41.380	44.860	44.860	47.840
13.	44.390	54.370	55.020	58.690
14.	63.210	70.660	72.300	71.350
15.	69.480	76.640	78.820	75.560
16.	72.620	79.630	82.090	77.670
17.	74.500	81.420	84.040	78.940

	1963-64	1964-65	1965-66	1966-68	1[illegible]
1.	1.3500	1.2000	1.5000	1.0000	1.
2.	4.4600	4.1000	4.3000	4.3400	4.
3.	7.2100	6.3500	5.7500	6.0000	6.
4.	9.3300	9.3200	7.6000	8.1000	8.
5.	11.320	11.500	8.8300	9.5000	9.
6.	15.910	14.260	12.630	13.730	12
7.	20.440	19.280	17.300	18.900	16
8.	26.090	23.740	22.420	24.550	21
9.	34.330	33.620	31.810	34.910	32
10.	41.140	39.540	37.450	41.130	39
11.	47.290	46.370	43.710	48.020	46
12.	52.530	51.240	48.180	52.950	51
13.	62.870	62.210	58.100	63.880	62
14.	74.940	75.170	69.680	76.620	76
15.	78.960	79.480	73.530	80.870	80
16.	80.970	81.640	75.460	83.000	82
17.	82.170	82.940	76.620	84.270	84

	1969-70	1970-71	1971-72	1972-75	1975-76
1.	1.0000	1.0000	.0	.0	.0
2.	4.3400	4.3400	3.6700	3.6700	4.4000
3.	6.0000	6.0000	5.5000	5.5000	6.6000
4.	8.1000	8.1000	8.1000	8.1000	8.5800
5.	9.5000	9.5000	9.9000	9.9000	9.9000
6.	12.630	12.630	13.750	14.040	12.930
7.	16.700	16.700	17.600	18.100	16.940
8.	21.250	21.250	22.000	22.780	21.450
9.	29.690	29.680	30.250	31.450	29.840
10.	34.750	36.950	35.200	38.960	34.870
11.	39.960	41.790	40.330	43.970	40.060
12.	43.680	46.820	44.000	49.190	43.760
13.	52.030	56.980	52.250	59.730	53.740
14.	64.510	72.490	64.630	75.870	65.370
15.	69.590	77.660	69.670	83.160	69.240
16.	72.820	81.620	72.880	86.810	71.180
17.	74.760	84.000	74.800	89.000	72.350

	1976-77	1977-78
1.	.0	.0
2.	.0	.0
3.	.0	.0
4.	3.7400	3.4500
5.	6.2300	5.7500
6.	10.180	9.4900
7.	14.740	13.340
8.	19.620	16.870
9.	28.460	24.150
10.	33.770	28.520
11.	39.140	33.350
12.	42.980	36.800
13.	53.190	44.740
14.	65.090	56.870
15.	69.060	60.910
16.	71.050	62.930
17.	72.240	64.15

Source: computed from the marginal rates given in the annual Finance Acts.

Chapter III

EMPIRICAL ANALYSIS.

The preceding chapters provide the necessary background and preperation for measurement of tax impact on dividends sothat in this chapter we can entirely concentrate on the empirical analysis The task incolves two steps: First, to identify the parameters by fitting the model to time-series aggregate data, and second, to simulate the equation so estimated in order to quantify the tax impact. Accordingly, we shall devote section 1 to estimation of the dividends equation and section 2 to simulation and quantification of the tax effect. Also of interest will be some disaggregated analysis. We shall consider in section 3, six major industry groups based on the RBI classification of its sample. The primary objective of the disaggregated analysis is to see if industries in different sectors react differently to the tax policy.

1. Estimation of the model.

Broad trends in the variables.

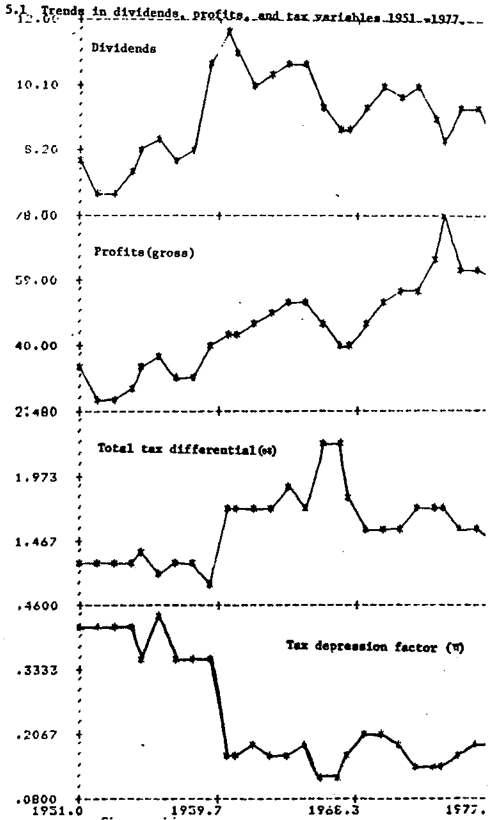
To start with, fluctuations in dividends are compared with those in the factors affecting dividends. These are shown in figs. 5.1 and 5.2.

The sharp rise in dividends (as rate on paid-up capital), in 1960-61 is too conspicuous to miss our attention, when it reached a peak 11.6 per cent. The upward swing actually started in 1953 itself. The rate briefly declined in 1956 before reaching the level of 1960. Thereafter, it has been a slow but gradual decline as though trying to reach the 1951 level. The declining course is marked by three cyclical movements roughly at five-year intervals; 1960 to 1965, 1965 to 1970, and 1970 to 1975. The cyclical could not be entirely due to periodical revisions of the RBI sample, as it coincides with the general economic trend in the economy. For example, the low points in 1962, 1968, and in 1974, reflect the recessionary trends experienced by the industrial sector.

Dividends and profits:

While comparing dividend fluctuations with other variables, the scale differences should be borne in mind. For example, the range of fluctuations in profits variable is much larger than dividends. Also in contrast to the declining trend in dividend rate, the trend in income variable had been upward, at least untill 1974, when it touched a peak 78 per cent. However, the fluctuations between 1951 and 1958, and between 1965 and 1972 are simillar to dividend changes. It is obvious from this comparision that profits variable alone cannot explain all the fluctuations in dividends. The sharp rise in 1960,

Fig. 5.1 Trends in dividends, profits, and tax variables 1951-1977



the general declining tendency, as well as the decline in 1974 in dividends seem to be independent of the movements of the profits variable.

Dividends and tax variables:

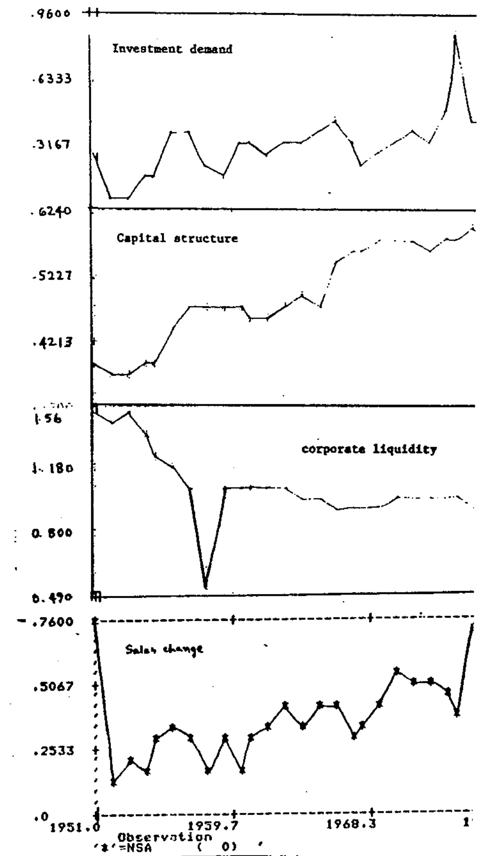
Comparision with the tax differential variable is more revealing. It is interesting that most of the highs and lows in dividends are matched by contra-movements in the tax differential variable. The peak level of dividends in 1960 might as well have been due to the lowest ever level of tax differential at 1.16 in 1959. The fall in dividend rate in 1968 and 1973 might also have been induced by the prevalent high tax differentiation.

The other main tax factor is the tax depression variable. Dividend rate is expected to be positively related to this variable. However, the plot does not reveal such a relation, at least upto 1960. Even after that point the relation is not so clear.

Dividends and other financial variables:

The second set of variables with which dividend movements are compared are the four financial variables to be included in our model.(fig.5.2).

Fig. 5.2 Trends in the corporate financial factors, 1951 - 1977.



Comparision with investment rate shows, that except for the years, 1958, 1959, and 1974, the expected negative relation is vague. The broad trend over the entire period, however, is opposite to dividends trend. The plot of capital structure variable also does not indicate in a clear manner, its positive relation with dividends rate. The plot of liquidity demand shows that upto 1958 its movements had been opposite to dividend movements, but after that it remained constant. Finally the plot of sales change also does not reveal any regular relationship with dividends.

The main points of this preliminary analysis can now be summarised. Dividends rate is relatively stable compared with other financial variables. However, there seems to be an abrupt shift in the course around 1960. Profits or the 'capacity' factor alone cannot explain all the fluctuations in dividends. Tax differential does appear to be a main factor influencing dividends. The influence of tax depression factor, as well as other financial factors seem to be less compelling.

Regression analysis (Cobb-Douglas assumptions).

Based on the trends analysis, the first hypothesis we wish to test by regression approach is that profits and tax variables can adequately explain all the movements in dividends rate. Also,

initially we hypothesise that the objective 'utility' function is of Cobb-Douglas type, so that tax differential variable and the elasticity coefficients involved are unity. (eqn 4.33). We expect unitary elasticities for at least one reason. As we are going to use aggregate data rather than firm-wise data, there is a chance that the firm-specific over- and under-responses might be evened-out producing unit elasticity of substitution. However, if the linear regression indicates that the elasticities are other than unity then we have to estimate the more general form by non-linear estimation precedures. The equation implied by the Cobb-Douglas assumption is,

$$D_t = \alpha^{\lambda} Y_t^{\lambda\beta_1} \phi_t^{-\lambda\beta_2} \Pi_t^{\lambda\beta_3} D_{t-1}^{(1-\lambda)} e^{u_t} \qquad -(5.1),$$

where we expect that $\beta_1 = \beta_2 = \beta_3 = 1$. ($1/p_r$ is denoted as Π).

The regression results are shown in table 5.1. The over-all significance is reassuring. Among the independent variables only Y and D_{t-1} are significant and the tax variables ϕ and Π are not significant at any acceptable level of significance. However, the coefficients of the tax variables have expected signs. The regression supports the earlier empirical studies regarding the applicability of Lintner's partial adjustment theory. The lag parameter λ is very low at 0.13, and the only convincing reason for managements to deviate

Table 5.1

Ordinary Least Squares, Dep Var... [illegible]
By (0.)
Sample 1951.-1977.
Number of Observations = 27.

Right-hand Variable		Estimated Coefficient	Standard Error	T Statistic	Mean of X	Aux. R Sq
Const	(0)	-.230223E-02	.505996	-.455000E-02	.999997	0.999
INCM (Y)	(0)	.119855	.118636	1.01031	3.77598	0.787
[illegible] (ϕ)	(0)	-.124037	.194978	-.636162	.444721	0.751
[illegible] (m)	(0)	.762324E-01	.210973	.361338	-1.11057	0.917
DVL (D_{t-1})	(0)	.868155	.209416	4.14561	2.19398	0.656

R-Squared = 0.6779 Adj R Sq = 0.6193
Mean of Dep Var. = [illegible]
Durbin-Watson Statistic (Adj. for 0. Gaps) = 1.5184
Sum of Squared Residuals = .137333
Standard Error of the Regression = .845718E-01
F-Statistic(4., 22.) = 11.573 Sig Level 0.0 Percent
Condition Number of Inputs 12.867
Residual Mean = .122492E-05

from the past dividend rate seems to be changes in profits variable, though not very compelling, judged by its statistical significance. The estimated elasticities with respect to Y and ϕ are 0.91 and -0.94 and subsequent t-tests prove that they are not different from unity.

Nevertheless, there is atleast one reason to suspect that this regression is not alright. The statistical significance of D_{t-1} is disturbingly high, raising a doubt that this might as well be due to 'lagged dependent bias' in the regression. Infact, there are three kinds of bias that could possibly be associated with this regression. The other two types are; a bias due to absence of other relevant factors affecting dividends, and a bias due to mis-specification of the dividend equation by restricting to Cobb-Douglas frame.

As noted by many studies, the equation (5.1) is a typical case of lagged dependant variable appearing as independent variable. As a result, OLS estimates of parameters might be biased, the extent of bias being unknown.[1] Further, the problem is worse in time-series analysis if there is serial correlation in errors, making the estimates inconsistent. It is also well-known that in such cases the standard indicators of serial correlation such as Durbin-Watson (DW) statistic or the serial correlation coefficient (ρ) cannot be relied. Even the Theil's H-statistic is not applicable in our case due to smallness of the sample.

Fortunately, a number of alternative procedures are now available in econometric literature dealing with equations containing lagged dependent variables.[2] However, the superiority of many of these procedures over OLS is not yet clearly established. For our purpose, we shall choose the following alternative procedures: (a) Generalised least squares(GLS) with iteration, (b) GLS with grid-search and iteration, (c) Residual adjusted GLS suggested by Durbin and later by Hatanaka[3], and (d) Wallis' combined instrumental variables and GLS.

Procedure (a) yields maximum likelihood estimates by iteration process in which an estimate of serial correlation coefficient of OLS residuals is used to transform the variables. Procedure (b) also yields maximum likelihood estimates, but instead of using the OLS residuals, it searches for an appropriate estimate of the serial correlation coefficient and conducts the iterations. Both procedures (a) and (b) yield estimates which are asymptotically efficient.

Procedures (c) and (d) combine the GLS with instrumental variable method. The Hatanaka procedure requires no iteration. It consists of instrumental variables to compute the serial correlation coefficient of errors followed by OLS method with all the variables

transformed as in the iteration methods. The Wallis' method requires estimation of D_{t-1} followed by GLS estimation of D_t using the estimated values, $\hat{D}_{t-1}$ for D_{t-1}.

The summary of the regression estimates by the four methods along with the OLS, is presented in table 5.2, which also include other factors.

Inclusion of other financial variables has not altered the OLS estimates. All the four variables prove to be statistically insignificant. There is no improvement in the over-all explanatory power of the equation as indicated by R^2 and SEE. The coefficient estimates of profits, lagged dividends as well as the two tax factors remained unchanged. Also estimation by the four alternative procedures has not improved the SEE and R^2 significantly. In the case of Hatanaka estimation, the R^2 has actually declined. There is however, a slight reduction in the bias as indicated by the lower influence of the lagged dependent variable in all the four procedures. The estimates of elasticity coefficients in these equations are much lower than unity. But the tax variables are still prove to be insignificant.

Thus, the empirical testing sofar, has not revealed much evidence regarding the tax impact. The only factors that emerged as significant are the profits and the lagged dividends. This would mean

Table 5.2 Auto-regression estimates

(Aggregate time-series, 1951 - 1977.)

Command/Line	OLSQ / 27	AUTOEST / 28	AUTOEST / 29	AUTOEST / 30	AUTOEST / 31
N/Num Constr	27/ 0	27/ 0	27/ 0	26/ 0	27/ 0
Eqn Std Err	.9013E-01	.8169E-01	.7935E-01	.8832E-01	.8570E-01
R-Squared	0.701	0.847	0.818	0.488	0.753
Dep Variable	DV (0)	DV (0)	DV (0)	DV (0)	DV (0)
C (0)	-.1137	.4328	.5392	.3676	.1974
T stat	(-.1570)	(.5452)	(.6898)	(.3983)	(.2495)
INCM (0)	.1046	.2240	.3000	.1430	.1627
T stat	(.5945)	(1.294)	(1.700)	(.7210)	(.9106)
PHI (0)	-.1103	.1617E-01	.3827E-02	.3430E-03	-.3390E-01
T stat	(-.4779)	(.5237E-01)	(.1190E-01)	(.1175E-02)	(-.1207)
PI (0)	.3142E-01	.7747E-01	.2599E-01	.6806E-01	.6588E-01
T stat	(.1032)	(.2316)	(.7878E-01)	(.1985)	(.1989)
DVL (0)	.8695	.4425	.2413	.5815	.6482
T stat	(3.319)	(1.581)	(.9226)	(1.453)	(2.293)
IN (0)	-.1897E-01	-.3897E-01	-.6140E-01	-.2024E-01	-.2292E-01
T stat	(-.3870)	(-.8619)	(-1.392)	(-.3798)	(-.4788)
EX (0)	-.2141	-.7929E-01	.2397E-01	-.2712	-.1524
T stat	(-.6773)	(-.2192)	(.6075E-01)	(-.6941)	(-.4408)
LI (0)	-.1249	.1637E-02	.3784E-01	-.4570E-01	-.4834E-01
T stat	(-.9779)	(.1690E-01)	(.4475)	(-.3951)	(-.4411)
SA (0)	.6155E-01	.7686E-01	.8833E-01	.1029	.7084E-01
T stat	(.9388)	(1.450)	(1.868)	(1.490)	(1.207)
*RHO*HAT(0)				.4164	
T stat				(1.237)	

Notes; AUTOEST 28= GLS with iteration
AUTOEST 29= GLS with grid-search
AUTOEST 30= Hatanaka residual adjustment with GLS
AUTOEST 31= Wallis GLS with Instrumental variables.

C=constant
INCM=the profits variable
PHI= $\phi \div \theta\delta$, PI= $\pi \cdot (1/p_r)$
DVL=lagged dividends
IN=investment demand, EX=capital structure
LI=liquidity demand, SA=sales change.

that certain fluctuations in dividends are left unexplained. For example, the sharp rise in 1960, the steep decline in 1972. The regression estimates of tax variables are contrary to our impressions of the trends analysis. Also the explanatory power of the equations so far estimated is not substantial.

Regression analysis (CES assumptions).

To make sure, there is no specification bias, we shall attempt to estimate the general form of the model,

$$D_t = \left[\frac{A^{\sigma}\theta^{\sigma}(1+B^{\eta}\delta^{\eta+1})^{\sigma+1}}{(B^{\eta}\delta^{\eta})^{\sigma+1}+A^{\sigma}\theta^{\sigma+1}(1+B^{\eta}\delta^{\eta+1})^{\sigma+1}}\right]^{\lambda} \left[\frac{Y}{P_r}\right]^{\lambda} D_{t-1}^{1-\lambda} \qquad -(5.2).$$

The general form will be estimated by a non-linear procedure combining the Gauss-Newton method with the method of steepest descent. These are iterative methods in which a prespecified initial values are used to find the vector in parameter space, along which the sum of squared residuals is decreasing most rapidly.[4] If the steepest descent fails then another set of values may be initiated. This process will be repeated untill the sum of squared residuals is minimum. The parameter to be estimated in the equation are λ, σ, η, A, and B. To minimise the computation burden, the financial factors can be excluded.

A number of initial parameter sets have been tried, but better estimates are obtained by using the OLS estimates to specify the initial set, and the coefficient of Y and p_r kept constant at unity. Also the parameter, η was initiated at 0.9. The non-linear results are presented in table 5.3.

The improvement in R^2 as well as the statistical significance of the coefficients only show that the linear regressions involve a serious specification bias. Infact, the lagged dependent bias can be regarded as negligible when compared to the other. But standard error is higher in the non-linear case, which could be due to a serial correlation. The elasticity of substitution at the firm-level is -3.24 and is well above unity. Shareholders' elasticity of substitution is also higher than unity at -1.64, but not as high as the firms' elasticity. The estimates reveal a high sensitivity on the part of firms to tax differentiation.

Also noticeable is the dividend lag which is now estimated at 0.3. It means that current dividends reflect only one-third of the changes in the desired dividends, which inturn would mean that two-thirds of a change in the tax policy in t'th year will prolong its effect on dividends.

It must be stated however, that too much reliance cannot be placed on these estimated also, for the simple reason that the non-linear

Table 5.3 Estimation by Gauss-Newton and the method of steepest descent.

Convergence achieved by Gauss.
Final sum of squares = .19648
Sample 1951.-1977.
Number of observations = 27.

	Explanatory variable		Estimated Coefficient	Standard Error	T Statistic	
1*	LAM(λ)	(0)	.301757	.400800	0.75289	LA
2*	SIG(σ)	(0)	-3.23871	.866870	-3.73610	SI
3*	YETA(η)	(0)	-1.63953	.985369	-1.66387	YE
4*	A	(0)	1.30467	.857984	1.52062	A
5*	B	(0)	1.65563	.864897	1.91425	B

R-Squared = 0.8977 Adj R Sq = 0.8817
Mean of Dep var. = 2.2152
Durbin-Watson Statistic (Adj. for 0. Gaps) = 1.6187
Sum of Squared Residuals = .196479
Standard Error of the Regression = .886518E-02
F-statistic(1., 25.) = 67.1508 Sig Level 0.0 Pe
Condition Number at least 34.243
Residual Mean = .58451E-02

estimation has always been tricky. In our case, the final estimates showed considerable variation whenever the initial parameter set is changed. And many a time convergence is not achieved, though the sums of squares changed only slowly. The posible reasons could be that firstly, the sample is too small, and secondly, the equation, though 'identified' in the statistical sense, is too complex for the estimation. The elasticity estimates are far higher than those obtained by the linear methods. In view of these difficulties, only the linear equation estimates are relied for simulation purposes.

2. Quantification of the impact of tax differentiation on dividends.

The method of quantification is as follows. For any given year, we shall obtain an imaginary level of dividends as if the tax policy had been neutral. This can be achieved by assigning unit value to the tax differential variables θ and δ and simulate the equation. The difference between the simulated dividends and the 'fitted dividends' can be interpreted as the impact of the prevalent degree of tax differentiation.

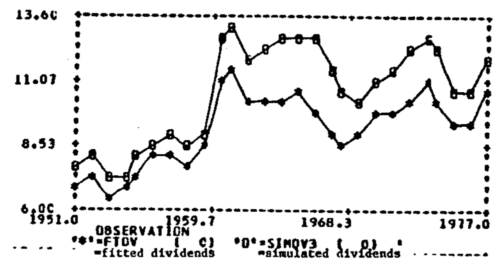
The fitted dividends and the simulated dividends along with the difference are presented in table 5.5, and plotted in fig.5.3.

In fig.5.3 the upper line indicates the movement of simulated dividends. The vertical distance at any point is the effect due to differential tax policy. The year 1959 represents a cut-off point and it is clear that the impact has been higher after 1959. The abolition of grossing-up widened the gap. Further the gap is wider during the period in which the dividends tax was in operation, especially the years 1961 through 1968. Even when the dividend taxes were abolished in 1968, the gap has remained high compared to the earlier years, 1951 through 1959. The average effect computed from table 5.4 is 0.64 during 1951-1959, while it is 2.14 during 1960-1968, and 1.51 during 1969-1977. (units of measurement are same as dividends, namely, as per cent of paid-up capital.).

Table 5.4 Measurement of effect of tax differential on dividend behaviour, 1951 - 1977.

year	fitted dividends	simulated dividends	total effect
1951.	6.9128	7.5775	.66466
1952.	7.2102	7.9035	.69324
1953.	6.5830	7.2159	.63294
1954.	6.7356	7.3832	.64761
1955.	7.4253	8.2969	.87159
1956.	8.0715	8.6612	.58979
1957.	8.2355	8.8942	.65868
1958.	7.8472	8.4748	.62763
1959.	8.6547	9.0344	.37975
1960.	11.010	12.903	1.8929
1961.	11.326	13.273	1.9471
1962.	10.187	11.916	1.7290
1963.	10.405	12.285	1.8796
1964.	10.414	12.679	2.2655
1965.	10.618	12.732	2.1143
1966.	9.7202	12.624	2.9035
1967.	8.9881	11.673	2.6848
1968.	8.6059	10.459	1.8527
1969.	9.0866	10.405	1.3180
1970.	9.8011	11.267	1.4663
1971.	10.009	11.461	1.4518
1972.	10.373	12.179	1.8061
1973.	11.022	12.941	1.9191
1974.	10.338	12.138	1.7999
1975.	9.3551	10.712	1.3569
1976.	9.4093	10.687	1.2781
1977.	10.545	11.728	1.1833

Fig. 5.3 Effect of tax differential on dividends, 1951 - 1977.



Seperation of effects at shareholders'and companies' levels.

The total effect can be split into two parts: Effect due to additional dividend taxes at company level and effect due to personal income tax. The first partial effect can be obtained by simulating with $\theta=1$. The second effect can be obtained with $\zeta=1$. These are presented in table 5.5 and plotted in fig.5.4. In plotting the seperate effects are shown by a single curve splitting the area representing the total effect, in two parts. For example, out of the total vertical distance in any year, the distance between the symbols '*' and '0' represents the effect due to personal tax and the rest of the distance represents the effect due to dividend taxes.

This bisection shows that much of the impact has been due to personal income tax and the impact of additional dividend taxes had been but negligible compared to the former. However upto the year 1959, the shaded patch occupied much of the gap.

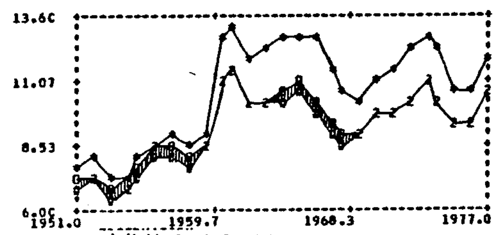
3. Industry-wise analysis.

The RBI sample companies used in our analysis, are fairly homogeneous in the sense that they all belong to the class of Indian widely-held companies with large capital base. Also, most of the factors responsible for variation in the dividend behaviour are taken

Table 5.5 Seperation of tax effects on dividends 1951 - 1977.

year	fitted dividends	when simulated with no dividends taxes	when simulated with no personal income tax	effect of excess dividends taxx	ef pe in
1951.	6.9128	7.1160	7.3697	.20314	.
1952.	7.2102	7.4221	7.6868	.21187	.
1953.	6.5830	6.7764	7.0181	.19345	.
1954.	6.7356	6.9335	7.1808	.19792	.
1955.	7.4253	7.6454	8.0694	.22013	.
1956.	8.0715	8.3399	8.3898	.26842	.
1957.	8.2355	8.5203	8.6054	.28482	.
1958.	7.8472	8.1186	8.1997	.27140	.
1959.	8.6547	8.6547	9.0344	.0	[illegible]
1960.	11.010	11.010	12.903	.0	1.
1961.	11.326	11.326	13.273	.0	1.
1962.	10.187	10.187	11.916	.0	1.
1963.	10.405	10.405	12.285	.0	1.
1964.	10.414	10.779	12.280	.36527	1.
1965.	10.618	10.989	12.331	.37112	1.
1966.	9.7202	10.065	12.226	.34478	2.
1967.	8.9881	9.3069	11.305	.31881	2.
1968.	8.6059	8.9076	10.129	.30174	1.
1969.	9.0866	9.0866	10.405	.0	1.
1970.	9.8011	9.8011	11.267	.0	1.
1971.	10.009	10.009	11.461	.0	1.
1972.	10.373	10.373	12.179	.0	1.
1973.	11.022	11.022	12.941	.0	1.
1974.	10.338	10.338	12.138	.0	1.
1975.	9.3551	9.3551	10.712	.0	1.
1976.	9.4093	9.4093	10.687	.0	1.
1977.	10.545	10.545	11.728	.0	1.

Fig. 5.4 Seperation of tax effects on dividends, 1951 - 1977.



*=dividends simulated for total tax differentiation
0=dividends simulated for excess dividends taxes
+=dividends fitted
2=points that coincided.

care of when we included them in the dividend equation. To that extent the possibility of variation in the dividend behaviour across the firms is reduced. Nevertheless, there still exists scope for variation in the parameter estimates.

For one thing, though the statutory corporation tax rate is same for the sample companies, the effective rate is not. The gap between the two differ from firm to firm depending upon their claims of tax deductions, exemptions and incentives. Same is the case with excess dividend tax rates. Further, the weights used in computing average personal income tax rate might also differ for different companies. All these might show-up as differences in the coefficient estimates if the dividend equation is fitted to firm-wise data.

Even if the tax variables do not differ, there still exist substantial scope for variation between firms, owing to the government controls which pervade their activity at every stage; controls on credit, capacity creation, raw-material procurement, production, marketing, as well as price controls, not to speak of the commodity taxation. These controls might necessitate specific methods of financial management, leading to differences in the dividend preferences.

Much of these variations in dividend behaviour can be brought to surface by industry-wise analysis. However, inorder not to loose the benefits of aggregation (not the least of such benefits being the subsuming of the specification bias if any), we shall limit the disaggregation to broad industry groups. For this purpose, the RBI classification of industries into six groups can be adapted. These are as follows:

Group I. Agriculture and allied industries (plantations).

Group II. Mining and quarrying.

Group III. Agro-based manufacturing industries (food, textiles, et

Group IV. Heavy manufacturing industries (Iron & steel, and other metals, machinery, transport equipment, chemicals, and products thereof).

Group V. Other manufacturing industries (Cement, rubber, paper, and products thereof).

Group VI. Other non-manufacturing industries (trading, shipping electricity generation and supply, hotels and restaurants etc.)[5].

The empirical analysis is more or less same as in the case of aggregate data. To minimise computations, we shall follow a routine. First, we shall estimate the linear regressions by OLS and the four auto-regression processes, involving the financial variables as well. From out of these five equation estimates we shall choose the one which may be considered as the best from the point of their summary statistics as well as the reliability of the coefficient estimates and their signs. The coefficients of the selected equation will be used to specify the initial parameter values for the non-linear equation. The estimated ~~non~~-linear parameter estimates, depending upon their reliability will be simulated for tax effects as in the case of aggregate analysis.

The regression results.

Tables 5.6 through 5.11 present the linear regression results. As expected, there are substantial differences among the six groups with respect to the goodness of fit, residual behaviour as well as the coefficient estimates of the dividend equations.

In the case of industry groups, I, and II, there is hardly any variation in the estimates by alternative methods. The differences in the $\bar{R}^2$, and SEE are not worth-noting. In these cases, the OLS estimates will serve the purpose as well. But not so in the other four groups, III, IV, V and VI. The differences in $\bar{R}^2$, SEE and consequently the coefficient estimates are substantial. The equations estimated by the two GLS methods yielded better results than the methods combining the instrumental variables, namely, the Hatanaka and Wallis methods. Between the estimates by the two former GLS methods, the choice indeed is difficult. But we shall settle for the GLS-grid search estimates

Table 5.6 Auto-regression estimates

Group I. Aggriculture and allied industries, 1951-1977.

Ordinal/Line	CLSQ (1) 41	AUTOEST (2) 42	AUTOEST (3) 43	AUTOEST (4) 44	AUTOEST (5) 45
Num Const	27/0	27/0	27/0	26/0	[illegible]
Std Err	.1079	[illegible]	.107[illegible]	[illegible]E-01	[illegible]
R-squared	0.980	[illegible]	[illegible]	[illegible]	[illegible]
Variable	DVA (0)	DVA (0)	DVA (0)	DVA (0)	DVA (0)
[illegible] (0)	1.563	1.670	1.468	1.464	1.5[illegible]
Std Error	([illegible])	(1.0[illegible])	([illegible])	(1.094)	([illegible])
Com (0)	.4737	.4736	.4768	.4452	.47[illegible]
Std Error	(.6311E-01)	(.6400E-01)	(.6487E-01)	(.6458E-01)	([illegible]E-01)
[illegible] (0)	.5179	.51[illegible]	[illegible]	[illegible]	[illegible]
Std Error	(.3186)	([illegible])	(.3950)	(.3978)	(.3820)
[illegible] (0)	.2108	.2231	.2329	[illegible]	.2281
Std Error	(.1065)	(.1023)	(.1037)	(.1013)	([illegible])
FI (0)	.4996	.5014	.5017	.5401	[illegible]
Std Error	(.1358)	(.1431)	(.130[illegible])	(.1500)	([illegible])
[illegible] (0)	-.1380E-01	-.1104E-01	-.9014E-02	[illegible]E-01	[illegible]
Std Error	(.3443E-01)	(.4627E-01)	(.4877E-01)	(.4331E-01)	(.4912E-01)
EXA (0)	-.1702	-.2250	-.1799	[illegible]E-01	[illegible]
Std Error	(.1888)	(.2082)	(.2257)	(.2150)	([illegible])
[illegible] (0)	-.9229E-[illegible]	-.7954E-01	-.5[illegible]E-01	[illegible]E-[illegible]	-.5327E-01
Std Error	(.2312)	([illegible])	(.2536)	(.2496)	(.2491)
SNA (0)	-.5193E-01	-.5457E-01	-.5549E-01	-.5[illegible]E-01	-.5527E-01
Std Error	(.2201E-01)	(.2186E-01)	(.2180E-01)	([illegible]E-01)	([illegible]E-01)
RHO-HAT (0)				.5729	
Std Error				(.[illegible])	

Notes: AUTOEST 42= GLS with iteration, AUTOEST 43= GLS with grid-search
AUTOEST 44= Hatanaka residual adjustment with GLS, AUTOEST 45= Wallis GLS with instrumental variables
Other symbols are same as in table 5.2 .

Table 5.7 Auto-regression estimates.

Group II. Mining and quarrying industries, 1951 - 1977.

COMMAND/LINE	OLSQ (1) / 15	AUTOEST (2) / 16	AUTOEST (3) / 17	AUTOEST (4) / 18	AUTOEST (5) / 19
N/NUM CONSTR	27/ 0	27/ 0	27/ 0	26/ 0	27/ 0
EQN STD ERR	.9487E-01	.9226E-01	.9231E-01	.9732E-01	.9346E-01
R-SQUARED	0.948	0.899	0.909	0.937	0.936
DEP VARIABLE	DV (0)	DV (0)	DV (0)	DV (0)	DV (0)
C	-.4276	-.7187	-.6949	-.4216	-.5539
T STAT (0)	(-.7304)	(-1.292)	(-1.249)	(-.6720)	(-.9719)
INCM	.3254	.3692	.3657	.3063	.3454
T STAT (0)	(2.033)	(2.928)	(2.819)	(1.815)	(2.359)
PHI	-.4898E-01	.9216E-01	.7074E-01	.1949E-01	-.3493E-02
T STAT (0)	(-.2688)	(.4770)	(.3696)	(.9325E-01)	(-.1883E-01)
DVL	.8132	.7750	.7818	.8025	.8019
T STAT (0)	(5.819)	(6.014)	(6.052)	(5.751)	(5.985)
IN	-.8824E-01	-.5417E-01	-.5860E-01	-.6744E-01	-.7648E-01
T STAT (0)	(-1.644)	(-1.085)	(-1.163)	(-1.094)	(-1.461)
EX	.1171E-01	-.4264E-01	-.4193E-01	-.7691E-02	-.1668E-01
T STAT (0)	(.7669E-01)	(-.2724)	(-.2708)	(-.4815E-01)	(-.1095)
LI	-.1629E-01	-.3822E-01	-.3642E-01	-.4965E-01	-.2499E-01
T STAT (0)	(-.1544)	(-.3191)	(-.3100)	(-.4033)	(-.2275)
SA	.3267E-01	.2417E-01	.2611E-01	.3625E-01	.3110E-01
T STAT (0)	(1.077)	(.8255)	(.8877)	(1.132)	(1.037)
*RHO*HAT(0)				.2254	
T STAT				(.8101)	

Notes: AUTOEST 16= GLS with iteration, AUTOEST 17= GLS with grid-searching, AUTOEST 18= Hatanaka residual adjustment with GLS, AUTOEST 19= Wallis GLS with instrumental variables. Other symbols are same as in table 5.2.

Table 5.8 Autoregression estimates.

Group III. Agro-based Manufacturing industries, 1951 - 1977.

COMMAND/LINE	OLSQ (1) / 20	AUTOEST (2) / 21	AUTOEST (3) / 22	AUTOEST (4) / 23	AUTOEST (5) / 24
N/NUM CONSTR	27/ 0	27/ 0	27/ 0	26/ 0	27/ 0
EQN STD ERR	.9809E-01	.9001E-01	.9005E-01	.9528E-01	.9030E-01
R-SQUARED	0.655	0.862	0.863	0.529	0.840
DEP VARIABLE	DV (0)	DV (0)	DV (0)	DV (0)	DV (0)
C	1.356	2.584	2.605	2.450	2.439
T STAT (0)	(1.005)	(2.184)	(2.195)	(1.948)	(2.061)
INCM	.3028	.2490	.2448	.2708	.2545
T STAT (0)	(2.207)	(2.288)	(2.291)	(2.163)	(2.265)
PHI	-.8878E-01	-.5039	-.5162	-.3311	-.4263
T STAT (0)	(-.1934)	(-1.039)	(-1.059)	(-.6002)	(-.9027)
PI	.4350E-02	-.1868	-.1932	-.1111	-.1599
T STAT (0)	(.1727E-01)	(-.7660)	(-.7812)	(-.3911)	(-.6576)
DVL	.4812	.1922	.1850	.2607	.2415
T STAT (0)	(2.098)	(.9838)	(.9504)	(1.023)	(1.203)
IN	-.9713E-01	-.4986E-01	-.4903E-01	-.6028E-01	-.5610E-01
T STAT (0)	(-1.822)	(-1.161)	(-1.149)	(-1.222)	(-1.248)
EX	-.2264	-.3995	-.4006	-.4032	-.3903
T STAT (0)	(-.7774)	(-1.397)	(-1.353)	(-1.341)	(-1.394)
LI	-.2071	-.2006	-.2041	-.2010	-.1865
T STAT (0)	(-1.198)	(-1.092)	(-1.105)	(-.9844)	(-1.038)
SA	.3313E-01	.4169E-01	.4163E-01	.4680E-01	.4125E-01
T STAT (0)	(.9647)	(1.619)	(1.629)	(1.488)	(1.543)
*RHO*HAT(0)				.4153	
T STAT				(1.359)	

Notes: AUTOEST 21= GLS with iteration, AUTOEST 22= GLS with grid-searching, AUTOEST 23= Hatanaka residual adjustment with GLS, AUTOEST 24= Wallis GLS with instrumental variables. Other symbols are same as in table 5.2.

Table 5.9 Autoregression estimates.

Group IV. Heavy manufacturing industries, 1951 - 1977.

Command/Line	OLSQ / 26	AUTOEST / 27	AUTOEST / 28	AUTOEST / 29	AUTOEST / 30
N/Num Constr	27/ 0	27/ 0	27/ 0	26/ 0	27/ 0
Eqn Std Err	.8958E-01	.8862E-01	.7966E-01	.9305E-01	.8866E-01
R-Squared	0.866	0.940	0.807	0.900	0.934
Dep Variable	DV (0)	DV (0)	DV (0)	DV (0)	DV (0)
C (0)	.2851	-.2034	.1146	.2649	-.1488
T stat	(.2279)	(-.1648)	(.1011)	(.1715)	(-.1203)
INCH (0)	.7288E-01	.3610E-01	.4594	.3266E-01	.3896E-01
T stat	(.6097)	(.3529)	(3.416)	(.2943)	(.3744)
PHI (0)	-.2688	-.1271	-.8397	-.2181	-.1439
T stat	(-.6201)	(-.3094)	(-1.917)	(-.4647)	(-.3479)
PI (0)	-.2582E-01	.7417E-01	-.4023	.1615E-01	.6296E-01
T stat	(-.1114)	(.3331)	(-1.807)	(.6208E-01)	(.2813)
DVL (0)	.8293	.9283	.2750	.9007	.9199
T stat	(4.449)	(5.462)	(1.727)	(4.904)	(5.353)
IN (0)	-.1148	-.1380	-.1501	-.1347	-.1351
T stat	(-1.948)	(-2.494)	(-2.915)	(-2.174)	(-2.424)
EX (0)	.5142E-01	.1959	-.3150E-01	.7845E-01	.1794
T stat	(.1458)	(.5596)	(-.1135)	(.1845)	(.5115)
LI (0)	-.2820	-.3195	-.3667E-01	-.2843	-.3136
T stat	(-.8639)	(-1.036)	(-.1343)	(-.8395)	(-1.009)
SA (0)	.3408E-01	.4327E-01	.1325E-01	.4495E-01	.4223E-01
T stat	(2.131)	(2.590)	(1.379)	(2.441)	(2.536)
*RHO*HAT(0)				-.2427	
T stat				(-1.241)	

Notes: AUTOEST 27= GLS with iteration, AUTOEST 28= GLS with grid-searching, AUTOEST 29= Hatanaka residual adjustment with GLS, AUTOEST 30= Wallis GLS with instrumental variables. Other symbols, as in table 5.2.

Table 5.10 Autoregression estimates.

Group V. Other manufacturing industries, 1951 - 1977.

Command/Line	OLSQ / 24	AUTOEST / 25	AUTOEST / 26	AUTOEST / 27	AUTOEST / 28
N/Num Constr	27/ 0	27/ 0	27/ 0	26/ 0	27/ 0
Eqn Std Err	.6569E-01	.6183E-01	.6179E-01	.6579E-01	.6214E-01
R-Squared	0.921	0.973	0.976	0.952	0.966
Dep Variable	DV (0)	DV (0)	DV (0)	DV (0)	DV (0)
C (0)	1.585	1.444	1.433	1.459	1.468
T stat	(2.550)	(2.816)	(2.841)	(2.479)	(2.765)
DVL (0)	.6830	.7051	.7077	.7034	.7002
T stat	(7.171)	(7.857)	(7.912)	(6.335)	(7.738)
INCH (0)	-.2175	-.2238	-.2226	-.2286	-.2253
T stat	(-1.390)	(-1.616)	(-1.624)	(-1.414)	(-1.592)
PHI (0)	-.3629	-.3770	-.3742	-.3873	-.3803
T stat	(-1.125)	(-1.344)	(-1.348)	(-1.227)	(-1.324)
PI (0)	-.1156	-.1004	-.9836E-01	-.1059	-.1042
T stat	(-.9286)	(-.9900)	(-.9853)	(-.9453)	(-.9925)
IN (0)	-.4734E-01	-.6029E-01	-.6151E-01	-.5446E-01	-.5781E-01
T stat	(-.9323)	(-1.395)	(-1.447)	(-1.104)	(-1.295)
EX (0)	-.4764E-01	-.4627E-02	-.3222E-02	-.7883E-02	-.8887E-02
T stat	(-.2841)	(-.3365E-01)	(-.2381E-01)	(-.5059E-01)	(-.6249E-01)
LI (0)	.1840	.1916	.1910	.1930	.1918
T stat	(1.223)	(1.517)	(1.534)	(1.314)	(1.474)
SA (0)	.8561E-01	.9389E-01	.9445E-01	.9255E-01	.9263E-01
T stat	(3.227)	(3.970)	(4.036)	(3.119)	(3.832)
*RHO*HAT(0)				-.3528	
T stat				(-1.269)	

Notes: AUTOEST 25= GLS with iteration, AUTOEST 26= GLS with grid-searching, AUTOEST 27= Hatanaka residual adjustment with GLS, AUTOEST 28= Wallis GLS with instrumental variables. Other symbols, as in table 5.2.

Table 5.11 Auto-regression estimates.

Group VI. Other non-manufacturing industries, 1951 - 1977.

COMMAND/LINE N/NUM CONSTR EQN STD ERR R-SQUARED	OLS. (1) 27/24, 0	AUTOEST (2) 27/25, 0	AUTOEST (3) 27/26, 0	AUTOEST (4) 26/27, 0	AUTOEST (5) 27/28, 0
	.6473E-01 0.634	.6464E-01 0.704	.6473E-01 0.639	.6799E-01 0.654	.6430E-01 0.606
DEP VARIABLE	DV (0)	DV (0)	DV (0)	DV (0)	DV (0)
C	1.255	1.258	1.255	.9125	1.267
T STAT (0)	(1.136)	(1.204)	(1.136)	(.7354)	(1.178)
INCM	.2846	.2945	.2846	.2256	.2846
T STAT (0)	(2.411)	(2.302)	(2.411)	(1.407)	(2.506)
PFI	.2206	.2515	.2206	.1940	.2416
T STAT (0)	(.6276)	(.6118)	(.6258)	(.5382)	(.7165)
PI	.5760E-01	.7243E-01	.5760E-01	.4547E-01	.6487E-01
T STAT (0)	(.3479)	(.4754)	(.3479)	(.2699)	(.4095)
GVL	.7578E-01	.9608E-01	.7578E-01	.2780	.3570E-01
T STAT (0)	(.3284)	(.4121)	(.3284)	(.7799)	(.3694)
IN	-.7212E-01	-.7563E-01	-.7212E-01	-.5268E-01	-.7407E-01
T STAT (0)	(-1.552)	(-1.591)	(-1.552)	(-.9015)	(-1.026)
EX	.2340E-01	.1659E-01	.2340E-01	.3970E-01	.1790E-01
T STAT (0)	(.9438E-01)	(.7170E-01)	(.9439E-01)	(.1567)	(.7472E-01)
LI	-.2599	-.2564	-.2599	-.1947	-.2623
T STAT (0)	(-1.008)	(-1.304)	(-1.008)	(-.6844)	(-1.043)
SA	-.4511E-01	-.5431E-01	-.4511E-01	-.4968E-01	-.4940E-01
T STAT (0)	(-1.354)	(-1.049)	(-1.354)	(-1.419)	(-1.204)
RHO ALPHA (0)				-.3104	
T STAT (0)				(-.7743)	

Notes: AUTOEST 25= GLS with iteration, AUTOEST 26= GLS with grid-searching, AUTOEST 27=Hatanaka residual adjustment with GLS, AUTOEST 28=Wallis GLS with instrumental variables. Other symbols as in table 5.2.

for the groups III, IV, and V, and GLS-iteration estimates for group VI The selected regression results are summarised in table 5.12.

First, let us consider the estimates of the lag parameter. The lag parameter is not always significant in the disaggregated analys This is quite in contrast to the earlier findings as well as our own findings based on aggregate data, regarding the general applicability o Lintner's hypothesis in India. Groups I, III, and VI, where it is not significant, consist of some of the major industries such as tea plants food, textiles, electricity generation and distribution, shipping and t hotels and restaurants. The results show that in these groups, the current dividends adjust instantaneously to the desired levels. This phenomenon may partly be attributed to the fact, that factors which are responsible for much of the uncertainity resulting in a cautious approa on the part of the managements, are the same as those already included in the dividend equation. But this explanation is not entirely satisfa because, were it so, it should equally be true in the case of other industries as well. The dividend inertia is fairly high in the case of groups II and V, whereas it is moderate in the case of group IV.

Profits variable is significant in most of the cases, as expected. But it has a wrong sign in the case of group V. The estimate of income elasticity vary from 0.3 for group III to 1.75 for group II.

Table 5.12 Estimates of the long-run parameters in the selected regressions by the six industry groups, 1951 - 1977.

industry group	estimation method	lag parameter (λ)	income elasticity (coeff. of profits)	elasticity of substitn. (coeff. of tax differential)	coeff. of tax depression var.	coeff. of investt. demand	coeff. of capital structure	coeff. of liquidity demand	coeff. of sales change
I	OLS	0.789	0.600**	0.656@	0.633@	-0.018	-0.342	-0.117	-0.066
II	OLS	0.186**	1.748**	-0.263	0.542@	-0.474	0.063	-0.088	-0.175*
III	GLS2	0.815	0.300**	-0.633*	-0.237	-0.060*	-0.492*	-0.250*	0.051*
IV	GLS2	0.725*	0.634**	-1.158*	-1.376**	-0.207**	-0.043	-0.367	0.183*
V	GLS2	0.292**	-0.762@	-1.280*	-0.337*	-0.210*	-0.011	0.613@	0.323**
VI	GLS1	0.904	0.326**	0.289	0.080	-0.085*	0.018	-0.288	-0.060*
All ind.	OLS	0.131**	0.802	-0.845	0.241	-0.145	-1.641	-0.956	0.472

Notes: 1) All coefficients are adjusted for the lag, whther the lag parameter is significant or not.
2) The symbols, * and ** indicate that the estimate is significant at 90%, and 95% levels respectively. The symbol @ indicates that the estimate, though significant, has unexpected sign.
3) OLS= Ordinary least squares, GLS1=GLS-iteration method with auto-correlation coefficient computed from the regression residuals, and GLS2=GLS iteration method with auto-correlation coefficient searched from grid points.

Source: Tables 5.2, and 5.6 through 5.11.

Infact, for groups I, III and VI, where there is not sufficient evidence for lagged adjustment, the estimates should be considered as much smalle Also, the profits variable should be regarded as insignificant for group inview of the negative sign. Thus none of the estimates provide evidenc in favour of unit income elasticity, which, as discussed above, is one indication of the specification bias.

Tax differential turns out to be an important variable in thre out of six groups, and interestingly, the three groups, III, IV, and V, comprise the manufacturing sector in India, whose share of paid-up capit in the sample, is over 75 per cent. In the case of group II it carries correct sign but not significant. The estimate of elasticity varies from -0.26 for group II to -1.28 for group V. The tax depression variab except in the case of group I, remains mostly insignificant. It carroe even a wrong sign in the case of groups I and II, which again is contrar to the earlier findings regarding the interpretation of the capacity var in terms of net cash-flows. In our case, the suitable interpretation seem to be gross cash-flows.

Investment demand tends to be an important factor in five out o the six groups, the exception being, not surprisingly, the agriculture an allied group comprising mainly the plantations. The other consistently signifiant variable has been sales change variable. But the sales change variable seem to play a kind of a'double-role', sometimes representing growth prospects and profit potential, and sometimes representing demand for retention of profits to meet working capital needs. Captial structure has been significant in the case of groups I and III, whereas the liquidity demand factor turns out to be important for groups III and V. These findings regarding the influence of financial variables on dividends, are not entirely in agreement with those of the earlier empirical attempts. Since the data base and time-period is more or less common, the reasons for the differences in the findings seem to be the specification of the equation and methods of estimation.

The non-linear estimates by Gauss-Newton method.

The non-linear estimation is not always successful. The method failed to achieve convergence in the case of groups I and II. (tables 5.13 through 5.16. The results for the manufacturing sector show that the coefficients of tax factors representing the elasticities of dividend preferences, are well above unity, whereas the restriction of income elasticity at one, seem to be not far from reality. The estimates of lag parameter for groups III, IV and V are 0.4, 0.36 and 0.28 respectively.

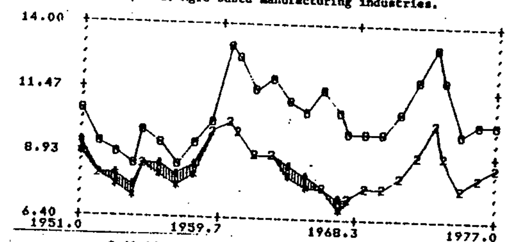
Table 5.13 Estimates by Gauss-Newton methods.
Group III. Agro-based manufacturing industries,1951-197

convergence achieved by gauss
***Coefficient std errs computed from last Gauss step.
Final sum of squares = .13901
Sample 1951.-1977.
Number of Observations = 27.

	Explanatory Variable		Estimated Coefficient	T Statistic		
1*	LAM (λ)	(0)	.406547	3.530931	LAM	(0)
2*	SIG (σ)	(0)	-3.89741	-2.327260	SIG	(0)
3*	YETA (η)	(0)	-1.41404	-2.197760	YETA	(0)

R-Squared = .94323 AdJ R Sq =.92212
Durbin-Watson Statistic (AdJ. for 0. Gaps) = 2.0564
Sum of Squared Residuals = .13901
Standard Error of the Regression = .067061
F-Statistic(2., 24.) = 42.000 Sig Level 100.0
Condition Number at least 26.659
Residual Mean = .007653

Fig.5.5 Impact of tax differential on dividends, 1951-1977, Group III. Agro-based manufacturing industries.

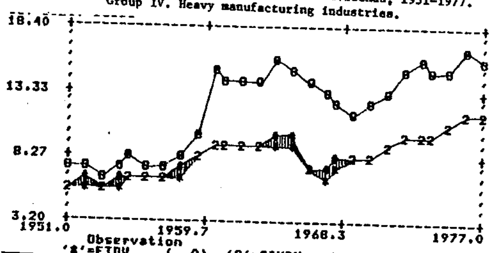


O=dividends simulated for total tax differentiation
+=dividends simulated for excess dividends taxes.
*=fitted divdends-
2=points coincided.

Table 5.14 **Estimates by Gauss-Newton methods.**
Group IV. Heavy manufacturing industries, 1951-1977.

```
convergence achieved by gauss
***Coefficient std errs computed from last Gauss step.
Final sum of squares =  .14532
        Sample 1951.-1977.
        Number of Observations =          27.
    Explanatory      Estimated         T
     Variable        Coefficient     Statistic
 1* LAM       (  0)   .366547       1.870983
 2* SIG       (  0)  -2.32213      -3.249812       LAM      (  0)
 3* YETA      (  0)  -1.72768      -2.857493       SIG      (  0)
                                                   YETA     (  0)
       R-Squared = .98645 AdJ R Sq =.97813
       Durbin-Watson Statistic (AdJ. for  0. Gaps) =  1.7635
       Sum of Squared Residuals =             .14532
       Standard Error of the Regression =      .057363
       F-Statistic(  2.,  24.) =  53.000     Sig Level  100.0 Percent
       Condition Number at least   26.659
       Residual Mean = .007653
```

Fig. 5.6 **Impact of tax differential on dividends, 1951-1977.**
Group IV. Heavy manufacturing industries.

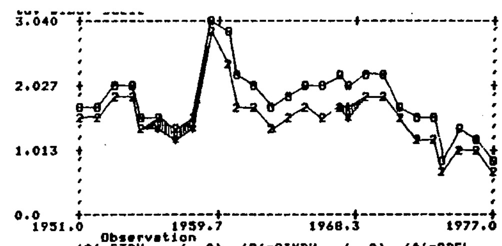


'*'=FTDV (0) 'O'=SIMDV (0) '+'=SDEL
* =fitted dividends
0 =dividends simulated for total tax differential
+ = dividends simulated for differential effected through excess excess dividends taxes.
2 = points concided.

Table 5.15 **Estimates by Gauss-Newton methods.**
Group V. Other manufacturing industries, 1951-1977.

```
convergence achieved by steepest descent
***Coefficient std errs computed from last Gauss step.
Final sum of squares =  .16529
        Sample 1951.-1977.
        Number of Observations =          27.
    Explanatory      Estimated         T
     Variable        Coefficient     Statistic
 1* LAM       (  0)   .286548       3.300982       LAM      (  0)
 2* SIG       (  0)  -1.96373      -1.976812       SIG      (  0)
 3* YETA      (  0)  -1.24593      -1.848398       YETA     (  0)
       R-Squared = .88447 AdJ R Su =.86521
       Durbin-Watson Statistic (AdJ. for  0. Gaps) =  1.5938
       Sum of Squared Residuals =             .16529
       Standard Error of the Regression =      .184637
       F-Statistic(  2.,  24.) =  37.000     Sig Level   95.0 Pe
       Condition Number at least   29.5384
       Residual Mean = .007653
```

Fig. 5.7 **Impact of tax differentiation on dividends, 1951-1977.**
Group V. Other manufacturing industries.



'*'=FTDV (0) 'O'=SIMDV (0) '+'=SDEL
*= fitted dividends
O= dividends simulated for total tax differentiation
+= dividends simulated for differentiation caused by excess dividends taxes.

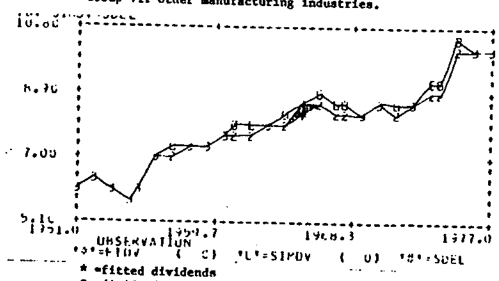
Table 5.16 Estimates by Gauss-Newton methods.
Group VI. Other non-manufacturing industries, 1951-1977.

```
convergence achieved by steepest descent
***Coefficient std errs computed from last Gauss step.
Final sum of squares =  .17947
        Sample 1951.-1977.
        Number of Observations =          27.

    Explanatory      Estimated        T
    Variable         Coefficient      Statistic

 1* LAM       (  0)    .136989       1.659381
 2* SIG       (  0)   -.321236      -1.573928        LAM      (  0)
 3* YETA      (  0)   -.568362      -1.485474        SIG      (  0)
                                                     YETA     (  0)
        R-Squared = .84239 Adj R Sq =.76521
        Durbin-Watson Statistic (Adj. for  0. Gaps) =  1.3868
        Sum of Squared Residuals =              .17947
        Standard Error of the Regression =        .194364
        F-Statistic(  2.,  24.) =  31.000      Sig Level   95.0 Perc
        Condition Number at least   29.5381
        Residual Mean = .007653
```

Fig. 5.8 Impact of tax differentiation on dividends, 1951-1977.
Group VI. Other manufacturing industries.



* =fitted dividends
O =dividends simulated for total tax differentiation
+ =dividends simulated for differentiation caused by excess dividends taxes.

in the linear regressions. On the other estimates of elasticity of substitutionbetween dividends and retentions are significantly higher than the linear estimates. Particularly for groups III and IV it is as high as 3.9 and 2.32. The elasticity estimates at shareholders' level are also well above unity.

Simulation.

The simulation exercise is carried out only for the groups III through VI and not attempted for groups I and II in view of the unexpected sign carried by the tax differential variable. The tax effects tabulated in tables 5.17 through 5.20 and plotted as figs. 5.5 through 5. Table 5.21 summarises the simulated effects of tax differentiation . The study period was divided into three 9-year sub-periods and the yearly effects were averaged over each of the sub-periods. The summarised averages show that the effect has been the highest in industri under group IV and group III, moderate in group VI and negligible in group VI. The averages indicate that the effect, in all the four cases, was the highest during the sub-period 1960-1968, which agree with the tendency in the aggregate results as well. The splitting of the effect with respect to tax differentiation at company and shareholders' levels show that the effect of excess dividends taxes is much lower compared to that of personal income tax, which also is in line with our findings of the aggregate analysis.

Table 5.17 Effect of tax differentiation on dividends, 1951 - 1977
Group III. Agro-based manufacturing industries.

year	fitted dividends	simulated dividends	total effect of tax differentiation	dividends simulated only for zero excess dividend tax	dividends simulated only for zero personal income tax	effect of excess dividend taxes	effect of personal income tax
1951.	9.1337	10.565	1.4313	10.206	1.0727	9.4546	.32096
1952.	7.9782	9.2285	1.2502	8.9153	.93703	8.2586	.28035
1953.	7.6343	8.8306	1.1964	8.5309	.89664	7.9026	.26827
1954.	7.2082	8.3377	1.1296	8.0548	.84659	7.4615	.25329
1955.	8.3201	9.9395	1.6194	9.6021	1.2820	8.6124	.29226
1956.	8.2556	9.1893	.93376	8.8333	.57775	8.5884	.33270
1957.	7.7480	8.7144	.96634	8.3649	.61686	8.0717	.32364
1958.	8.2999	9.3351	1.0352	8.9607	.66080	8.6466	.34669
1959.	9.5924	10.356	.76380	10.356	.76380	9.5924	.0
1960.	10.129	13.280	3.1512	13.280	3.1512	10.129	.0
1961.	9.6327	12.629	2.9967	12.629	2.9967	9.6327	.0
1962.	8.8800	11.607	2.7269	11.607	2.7269	8.8800	.0
1963.	8.9830	11.921	2.9377	11.921	2.9377	8.9830	.0
1964.	8.1277	11.156	3.0279	10.721	2.5934	8.4571	.32739
1965.	7.8657	10.532	2.6666	10.122	2.2564	8.1845	.31878
1966.	7.4852	11.397	3.9114	10.953	3.4675	7.7896	.30442
1967.	6.9698	10.612	3.6421	10.199	3.2288	7.2533	.28346
1968.	7.0533	9.6517	2.5984	9.2758	2.2225	7.3391	.28585
1969.	7.6192	9.6169	1.9977	9.6169	1.9977	7.6192	.0
1970.	7.6915	9.7718	2.0803	9.7718	2.0803	7.6915	.0
1971.	8.2687	10.437	2.1679	10.437	2.1679	8.2687	.0
1972.	8.9290	11.742	2.8135	11.742	2.8135	8.9290	.0
1973.	10.104	13.287	3.1837	13.287	3.1837	10.104	.0
1974.	9.0353	11.882	2.8470	11.882	2.8470	9.0353	.0
1975.	7.8708	9.9344	2.0636	9.9344	2.0636	7.8708	.0
1976.	8.2674	10.297	2.0295	10.297	2.0295	8.2674	.0
1977.	8.4830	10.203	1.7201	10.203	1.7201	8.4830	.0

Table 5.18 Effect of tax differentiation on dividends, 1951 - 1977
Group IV. Heavy manufacturing industries.

year	fitted dividends	simulated dividends	total effect of tax differentiation	dividends simulated only for zero excess dividends tax	dividends simulated only for personal income tax	effect of excess dividend taxes	effect of personal income tax
1951.	5.6687	7.1833	1.5147	6.7910	1.1223	5.9963	.32758
1952.	5.8290	7.3865	1.5575	6.9830	1.1540	6.1658	.33684
1953.	5.4767	6.9401	1.4634	6.5610	1.0843	5.7932	.31649
1954.	5.9830	7.3816	1.3987	7.1675	1.1845	6.3287	.34575
1955.	6.5048	8.6870	2.1822	8.2125	1.7077	6.8806	.37576
1956.	6.5017	7.7397	1.2381	7.2579	.75624	6.9333	.43167
1957.	6.1616	7.4599	1.2982	6.9793	.81770	6.5857	.42411
1958.	6.5574	7.9390	1.3816	7.4276	.87022	7.0087	.45134
1959.	8.5396	9.6731	1.1334	9.6731	1.1334	8.5396	.0
1960.	9.4268	14.646	5.2193	14.646	5.2193	9.4268	.0
1961.	8.9908	13.969	4.9779	13.969	4.9779	8.9908	.0
1962.	9.2177	14.250	5.0323	14.250	5.0323	9.2177	.0
1963.	9.2004	14.578	5.3775	14.578	5.3775	9.2004	.0
1964.	9.3659	15.677	6.3111	14.696	5.3300	9.9912	.62525
1965.	9.2207	14.825	5.6046	13.897	4.6768	9.8362	.61556
1966.	7.3333	14.531	7.1975	13.621	6.2881	7.8246	.49131
1967.	6.9301	13.732	6.8018	12.873	5.9424	7.3944	.46430
1968.	7.3976	12.321	4.9239	11.550	4.1528	7.8914	.49384
1969.	8.0393	11.741	3.7020	11.741	3.7020	8.0393	.0
1970.	8.5260	12.585	4.0591	12.585	4.0591	8.5260	.0
1971.	9.0755	13.255	4.1791	13.255	4.1791	9.0755	.0
1972.	9.6515	15.070	5.4181	15.070	5.4181	9.6515	.0
1973.	10.005	15.621	5.6164	15.621	5.6164	10.005	.0
1974.	9.7459	15.217	5.4712	15.217	5.4712	9.7459	.0
1975.	10.447	15.257	4.8105	15.257	4.8105	10.447	.0
1976.	11.491	16.423	4.9318	16.423	4.9318	11.491	.0
1977.	11.627	15.700	4.0730	15.700	4.0730	11.627	.0

Table 5.19 Effect of tax differentiation on dividends, 1951 - 1977
Group V. Other manufacturing industries.

year	fitted dividends	simulated dividends	total effect of tax diff-erentiation	dividends simulated only for zero excess dividends tax	dividends simulated only for personal income tax	effect of excess dividends tax	effect of personal income tax
1951.	1.4908	1.6568	.16593	1.6158	.12497	1.5286	.37793E-01
1952.	1.5129	1.6813	.16839	1.6398	.12683	1.5513	.38356E-01
1953.	1.8859	2.0958	.20991	2.0440	.15810	1.9337	.47812E-01
1954.	1.8621	2.0693	.20724	2.0181	.15609	1.9093	.47205E-01
1955.	1.2865	1.4635	.17701	1.4273	.14083	1.3191	.32601E-01
1956.	1.4247	1.5398	.11508	1.4963	.71602E-01	1.4661	.41404E-01
1957.	1.2428	1.3533	.11053	1.3338	.70967E-01	1.2802	.37419E-01
1958.	1.4335	1.5610	.12749	1.5154	.81858E-01	1.4767	.43159E-01
1959.	2.8648	3.0284	.16361	3.0284	.16361	2.8648	.0
1960.	2.3228	2.8267	.50394	2.8267	.50394	2.3228	.0
1961.	1.7724	2.1569	.38453	2.1569	.38453	1.7724	.0
1962.	1.6400	1.9913	.35137	1.9913	.35137	1.6400	.0
1963.	1.3370	1.6414	.30437	1.6414	.30437	1.3370	.0
1964.	1.5065	1.8952	.38873	1.8414	.33493	1.5505	.44016E-01
1965.	1.6891	2.0872	.39811	2.0280	.33885	1.7385	.49354E-01
1966.	1.4951	2.0278	.53267	1.9702	.47511	1.5389	.43834E-01
1967.	1.6110	2.1850	.57397	2.1230	.51194	1.6582	.47235E-01
1968.	1.6024	2.0115	.40907	1.9544	.35197	1.6493	.46818E-01
1969.	1.8739	2.2184	.34456	2.2184	.34456	1.8739	.0
1970.	1.8240	2.1697	.34564	2.1697	.34564	1.8240	.0
1971.	1.4441	1.7096	.26553	1.7096	.26553	1.4441	.0
1972.	1.2418	1.5146	.27276	1.5146	.27276	1.2418	.0
1973.	1.2100	1.4757	.26577	1.4757	.26577	1.2100	.0
1974.	.67398	.82202	.14804	.82202	.14804	.67398	.0
1975.	1.0751	1.2727	.19767	1.2727	.19767	1.0751	.0
1976.	1.0739	1.2591	.18524	1.2591	.18524	1.0739	.0
1977.	.71326	.81541	.10215	.81541	.10215	.71326	.0

Table 5.20 Effect of tax differentiation on dividends, 1951 - 1977
Group VI. Other non-manufacturing industries.

year	fitted dividends	simulated dividends	total effect of tax diff-erentiation	dividends simulated only for zero excess dividends tax	dividends simulated only for zero persO-nal income tax	effect of excess dividends tax	effect of personal income tax
1951.	6.0188	6.0863	.67459E-01	6.0702	.51391E-01	6.0346	.15932E-01
1952.	6.4433	6.5155	.72215E-01	6.4983	.55014E-01	6.4603	.17056E-01
1953.	6.0365	6.1042	.67657E-01	6.0881	.51541E-01	6.0525	.15960E-01
1954.	5.7051	5.7690	.63942E-01	5.7538	.48711E-01	5.7202	.15101E-01
1955.	6.0617	6.1448	.83098E-01	6.1286	.66875E-01	6.0778	.16046E-01
1956.	6.9183	6.9753	.56994E-01	6.9542	.35926E-01	6.9393	.20967E-01
1957.	7.1235	7.1879	.64395E-01	7.1654	.41903E-01	7.1455	.22051E-01
1958.	7.2069	7.2721	.65146E-01	7.2493	.42394E-01	7.2295	.22614E-01
1959.	7.2474	7.2901	.42639E-01	7.2901	.42639E-01	7.2474	.0
1960.	7.5526	7.7109	.15826	7.7109	.15826	7.5526	.0
1961.	7.6573	7.8177	.16045	7.8177	.16045	7.6573	.0
1962.	7.7841	7.9454	.16125	7.9454	.16125	7.7841	.0
1963.	7.8584	8.0305	.17208	8.0305	.17208	7.8584	.0
1964.	8.0638	8.2617	.19789	8.2366	.17279	8.0883	.24562E-01
1965.	8.4073	8.5973	.19002	8.5712	.16391	8.4329	.25607E-01
1966.	8.5846	8.8653	.28079	8.8384	.25386	8.6108	.26247E-01
1967.	8.3348	8.6074	.27262	8.5813	.24648	8.3603	.25483E-01
1968.	8.2564	8.4570	.20066	8.4314	.17497	8.2815	.25143E-01
1969.	8.2760	8.4249	.14886	8.4249	.14886	8.2760	.0
1970.	8.4916	8.6486	.15706	8.6486	.15706	8.4916	.0
1971.	8.3170	8.4666	.14960	8.4666	.14960	8.3170	.0
1972.	8.5451	8.7262	.18109	8.7262	.18109	8.5451	.0
1973.	8.9140	9.1029	.18891	9.1029	.18891	8.9140	.0
1974.	8.9486	9.1353	.18765	9.1383	.18965	8.9486	.0
1975.	10.173	10.356	.18298	10.356	.18298	10.173	.0
1976.	10.038	10.208	.17014	10.208	.17014	10.038	.0
1977.	10.035	10.178	.14286	10.178	.14286	10.035	.0

Table 5.21 Average effect of tax differentiation by industry groups and by three sub-periods.

(a.) over-all effect

(dividends as per cent of paidup capl)

industry group	1951-1959	1960-1968	1969-1977	1951-1977
III.	1.15	3.07	2.32	2.18
IV.	1.49	5.71	4.69	3.96
V.	0.16	0.43	0.24	0.28
VI.	0.06	0.20	0.17	0.14
All ind.	0.64	2.14	1.51	1.43

(b) effect due to personal income tax

industry group	1951-1959	1960-1968	1969-1977	1951-1977
III.	0.88	2.96	2.29	2.04
IV.	1.16	5.41	4.69	3.75
V.	0.12	0.40	0.24	0.26
VI.	0.04	0.19	0.17	0.13
All ind.	0.43	1.95	1.51	1.30

(c) effect due to excess dividends taxes

industry group	1951-1959	1960-1968	1969-1977	1951-1977
III.	0.27	0.11	nil	0.14
IV.	0.33	0.30	nil	0.21
V.	0.04	0.03	nil	0.02
VI.	0.02	0.01	nil	0.01
All ind.	0.21	0.19	nil	0.13

Notes: Each number is a 9-year average and figures in the last columns are averages over the entire period.

Sources: Tables 5.17 through 5.20 , . 5.4 and 5.5

Summary.

In this chapter an attempt was made to fit the dividend model postulated in the earlier chapter to the time-series data on Indian corporate sector and thereby measure the dividend-sensitivity to variation in the tax differentiation, as well as quantify the tax effects by simulating the estimated model.

Starting with relatively simpler degeneration of the general model, the coefficients are estimated by different methods with a view to identify the correct version of the model. The Cobb-Douglas version of the model has not fit the data satisfactorily. Attempts to correct the lagged dependent bias, and serial correlations have not improved the situation. On the other, the CES version, though proved to be a better specification, yielded coefficient estimates which seem to be less stable.

The disaggregated analysis by six broad industry categories brought the relationships in a clearer way. Specifically, the three industry groups, III, IV, and V, comprising the manufacturing sector proved to be very sensitive to tax changes.

The quantification of the effect by means of simulating the best estimated equations for each group show that much of the effect has been due to the adoption of 'Classical' system. Between the three 9-year divisions of the overall period, the impact was the lowest during the first sub-period, 1951-1959, when 'grossing-up' practice was in force. The effect was highest in 1960-1968 during which time the Classical system was just introduced, the excess dividends taxes were levied, and also the rates of personal income taxes had been higher compared to the other sub-periods. An important indication is that the effect of excess dividends taxes by itself is very low, compared to that of personal income tax, which is not fully in agreement with the prevalent view regarding these taxes.

Notes and references.

1. Johnston, J. (1972). Econometric methods. McGraw-Hill. pp 259-265.

2. For a review of these procedures see, Ibid..

3. Hatanaka, M. (1974).'An efficient two-step estimation for the dynamic adjustment model with autoregressive errors', Journal of Econometrics. pp 199-120.

4. The aligorithm of the non-linear estimation as well as of other regression procedures is necessarily the same as in

   Peck, J. (1980). Program for Econometric Computation (PEC) Comput manual, Yale Computer Centre.

5. For details regarding the sample coverage etc. see,

   Reserve Bank of India, Financial statistics of the Joint-stock companies in India, Vol I.

Appendix 2

Data on corporate financial variables used in the analysis, 1951 - 1977

All industries.

year	dividends	profits	investment demand	capital structure	liquidity demand	sales change
1951.	7.8300	32.720	23.790	38.300	1.4670	74.200
1952.	6.9700	23.500	2.9200	37.510	1.4601	12.050
1953.	7.0300	25.420	6.4100	36.460	1.4663	21.680
1954.	7.7000	28.630	13.830	38.500	1.3610	17.140
1955.	8.1800	33.710	16.080	39.030	1.2575	29.230
1956.	8.4800	35.520	39.270	43.570	1.1802	34.160
1957.	7.9600	30.150	36.930	46.910	1.0721	27.930
1958.	8.3200	31.760	20.960	46.820	.49030	16.860
1959.	10.850	38.630	16.000	46.700	1.0261	29.810
1960.	11.570	44.320	31.490	47.070	1.0484	18.610
1961.	11.010	44.530	29.290	45.360	1.0470	29.670
1962.	10.140	46.290	26.690	46.230	1.0428	31.700
1963.	10.490	50.610	30.560	46.920	1.0354	41.540
1964.	10.740	52.640	29.660	49.290	1.0214	35.400
1965.	10.610	51.100	36.290	47.510	1.0113	41.000
1966.	9.3600	45.680	44.320	54.320	.92180	41.210
1967.	8.8000	39.990	31.870	55.650	.91920	29.510
1968.	8.7400	39.240	19.240	56.480	.91890	32.430
1969.	9.4100	46.290	25.880	56.790	.94180	43.640
1970.	10.220	51.460	33.910	57.020	.96780	54.140
1971.	9.7300	54.670	35.250	57.330	.96060	52.680
1972.	10.190	56.480	30.560	56.420	.96170	51.630
1973.	9.2000	63.880	46.580	57.040	.97290	44.430
1974.	8.4200	77.310	82.050	57.630	.98940	36.570
1975.	9.6200	62.710	39.710	58.940	.95420	70.470
1976.	9.5400	62.720	42.910	57.830	.94310	69.360
1977.	8.5100	59.950	32.860	58.920	.95630	71.350

contd.

Group I. Agriculture and allied industries.

year	dividends	profits	investment demand	capital structure	liquidity demand	sales change
1951.	11.870	29.400	38.050	23.220	1.3700	22.450
1952.	7.6600	10.200	41.420	27.610	1.3500	20.890
1953.	14.630	51.630	42.980	22.510	1.2400	41.060
1954.	26.890	88.880	47.370	22.510	1.0800	45.000
1955.	16.400	37.640	51.430	23.070	1.0800	15.320
1956.	16.270	49.760	63.920	24.460	1.0200	11.350
1957.	10.950	28.150	66.480	23.530	1.0600	116.67
1958.	11.080	32.320	69.400	23.750	1.0400	115.57
1959.	14.210	42.260	72.090	23.650	1.0400	14.130
1960.	14.130	42.040	76.460	23.740	1.0600	1.6600
1961.	11.110	31.850	80.190	20.940	1.0500	1.4500
1962.	10.600	33.700	85.430	22.210	.97000	8.6700
1963.	9.7200	32.340	86.990	22.580	1.0300	19.280
1964.	10.140	35.160	91.730	56.810	.44000	6.0600
1965.	10.370	37.540	96.030	25.090	1.0300	25.260
1966.	10.960	40.090	117.60	29.310	.81000	9.6900
1967.	9.8500	37.790	93.920	31.620	.75000	3.6900
1968.	8.0100	26.100	96.550	32.140	.83000	1.9800
1969.	8.9000	33.030	113.98	34.430	.89000	5.2800
1970.	10.130	41.120	95.960	35.990	.71000	34.540
1971.	10.520	40.990	84.380	36.780	.83000	37.290
1972.	10.030	37.600	86.070	37.360	.84000	9.6900
1973.	8.9200	41.070	87.320	39.980	.79000	21.690
1974.	8.8600	81.990	80.180	39.020	.67000	124.73
1975.	11.780	72.980	91.890	39.940	.70000	8.6700
1976.	11.830	64.250	82.320	38.540	.71000	9.5400
1977.	12.140	70.150	112.43	39.780	.75000	20.030

contd.

Group II. Mining and quarrying industries.

year	dividends	profits	investment demand	capital structure	liquidity demand	sales change
1951.	6.5900	28.990	16.230	.3660C	1.3200	.65080
1952.	7.2600	36.150	26.520	.3670C	1.2500	.42910
1953.	6.5000	28.290	15.280	.3740C	1.3600	.57600
1954.	7.2000	28.CC0	13.820	.3720C	1.3700	.75370
1955.	8.2000	36.590	15.540	.3590C	1.3000	.76020
1956.	7.8000	29.C50	21.100	.3479C	1.1800	.22018
1957.	8.6000	39.950	24.680	.3723C	1.1500	.53170
1958.	9.2300	40.840	28.220	.3812C	1.1900	.12613
1959.	9.6600	27.300	14.160	.4243C	1.1400	.62000E-01
1960.	11.230	46.360	25.770	.4216C	2.1100	.22770
1961.	8.1300	34.310	19.220	.3919C	2.0100	.17920
1962.	6.6300	39.690	31.910	.41640	2.0000	.39000
1963.	6.4900	38.660	50.620	.4725C	1.9600	.26000
1964.	5.7500	31.710	28.530	.49490	1.9500	.14000
1965.	5.4900	35.160	18.360	.5075C	2.1500	.43000
1966.	9.4900	30.540	27.540	.5918C	2.0200	.91000
1967.	12.180	44.230	11.190	.54760	1.9600	.28000
1968.	12.190	44.250	14.310	.5149C	1.9500	.21000
1969.	12.540	48.9C0	19.530	.5183C	1.7800	.17000
1970.	12.500	53.650	21.960	.4600C	1.4700	.69000E-01
1971.	15.560	53.310	12.940	.5397C	1.4200	.27400
1972.	15.540	63.150	13.380	.5337C	1.0800	.18400
1973.	15.030	62.410	24.110	.5464C	1.0600	.67800E-01
1974.	15.050	69.230	31.620	.7494C	.79000	.14800
1975.	15.070	70.390	90.350	.9129C	.86000	.30300
1976.	16.210	74.250	65.540	.9265C	1.2300	.31400
1977.	16.320	78.190	56.850	.9320C	1.2400	.35200

contd.

Group III. Agro-based manufacturing industries.

year	dividends	profits	investment demand	capital structure	liquidity demand	sales change
1951.	8.6400	38.550	40.550	39.52C	1.2300	1.1000
1952.	7.4600	20.020	7.9500	37.21C	1.3600	.15000
1953.	7.5700	24.620	50.310	36.58C	1.4700	.36000
1954.	7.1800	23.430	15.630	38.39C	1.4400	.41000E-01
1955.	8.1300	42.140	25.590	37.95C	1.3300	.33400
1956.	7.8600	31.390	46.460	43.41C	1.2400	.35700
1957.	6.9300	22.230	29.150	46.56C	1.1200	.32600
1958.	7.6000	25.970	3.7300	46.21C	1.1100	.22500
1959.	10.980	38.290	16.160	45.75C	1.0700	.30000
1960.	11.470	49.960	51.060	47.92C	1.0300	.51900
1961.	10.220	51.600	44.120	45.54C	1.5100	.50700
1962.	9.1100	49.140	38.070	47.68C	1.5600	.29900
1963.	9.6500	53.970	30.820	48.09C	1.7300	.53500
1964.	9.6100	55.140	50.140	50.92C	1.7900	.30200
1965.	9.6300	47.740	56.630	55.13C	1.7300	.53700
1966.	7.6900	49.710	47.540	55.91C	1.3100	.65800
1967.	7.1600	41.690	33.790	57.77C	1.3400	.43300
1968.	7.2300	45.010	37.590	59.74C	1.9000	.54000
1969.	7.8600	52.160	49.800	60.34C	1.8600	.54000
1970.	8.4800	54.170	55.440	61.61C	1.9000	.68200
1971.	8.6600	54.640	46.200	60.86C	1.8600	.88600
1972.	9.7000	54.280	34.940	57.52C	1.3400	.72100
1973.	8.0000	65.010	84.520	57.32C	1.6200	4.0300
1974.	7.2600	65.460	99.080	57.22C	1.5300	.32600
1975.	7.3900	41.100	42.810	50.61C	1.4800	.65300
1976.	7.4000	52.130	43.250	65.33C	1.4100	.65200
1977.	8.2100	54.280	45.070	64.95C	1.4200	.53600

contd.

Group IV. Heavy manufacturing industries.

year	dividends	profits	investment demand	capital structure	liquidity demand	sales change
1951.	5.9690	31.260	26.490	38.568	1.1449	32.100
1952.	6.0615	31.195	22.047	40.545	1.0600	14.759
1953.	5.7255	29.917	18.074	42.278	1.0308	4.3980
1954.	6.0606	34.521	25.368	43.718	.99660	45.170
1955.	7.5161	47.196	40.790	45.112	1.0418	46.648
1956.	7.7271	41.483	68.985	48.284	1.0892	56.740
1957.	7.9123	36.831	83.136	53.097	.97901	40.340
1958.	8.4514	36.570	32.758	52.790	.89117	21.900
1959.	11.202	43.853	32.028	52.517	.80117	47.945
1960.	12.268	49.128	40.702	50.824	.86951	40.130
1961.	10.649	48.152	43.595	48.316	.88345	28.630
1962.	9.6642	52.528	40.775	48.724	.85280	38.608
1963.	10.105	58.241	46.066	48.844	.97359	44.360
1964.	10.831	63.349	39.027	49.640	.88307	55.134
1965.	10.752	63.577	47.429	49.457	.92928	33.645
1966.	8.2606	48.230	64.794	53.706	.94028	31.681
1967.	7.1757	40.985	43.269	55.940	.99056	18.828
1968.	7.2244	38.414	18.529	55.455	1.0372	27.410
1969.	7.9859	45.374	29.337	55.414	1.1599	40.258
1970.	8.6207	52.986	38.225	55.595	1.1782	54.141
1971.	8.8571	58.357	44.964	56.342	1.1438	48.054
1972.	9.3764	57.775	39.399	55.800	1.1047	40.013
1973.	8.4754	62.516	48.479	55.874	1.0776	41.744
1974.	7.8579	75.221	83.459	57.021	1.0052	121.36
1975.	9.5402	69.733	40.317	57.189	.87294	71.916
1976.	9.4259	76.523	41.257	57.249	.93173	72.650
1977.	9.5312	75.213	43.158	58.257	.94586	74.856

contd.

Group V. Other manufacturing industries.

year	dividends	profits	investment demand	capital structure	liquidity demand	sales change
1951.	8.8770	37.830	25.080	33.240	1.2887	46.800
1952.	8.4700	35.940	25.270	33.780	1.2357	9.1100
1953.	8.4100	34.980	13.250	32.240	1.2511	1.8100
1954.	8.6800	36.090	18.490	32.140	1.1748	17.860
1955.	9.1200	38.290	28.210	31.010	1.1725	31.510
1956.	10.980	45.870	38.280	37.810	1.0928	26.600
1957.	10.170	41.530	45.720	39.810	1.0113	29.050
1958.	9.7200	42.140	33.900	39.330	1.0241	26.790
1959.	12.140	44.060	15.230	37.800	1.1389	27.350
1960.	12.300	41.550	16.280	37.380	1.2955	22.870
1961.	10.300	41.290	26.290	35.980	1.5382	17.025
1962.	9.8900	43.600	27.470	36.480	1.3835	21.712
1963.	10.070	45.060	38.840	40.830	1.4129	23.081
1964.	9.0200	42.730	26.460	42.310	1.5034	15.830
1965.	10.470	43.730	25.830	43.550	1.5563	28.200
1966.	9.9700	40.790	32.580	47.590	1.3953	40.930
1967.	10.410	37.100	27.680	48.550	1.2960	20.940
1968.	9.7800	37.500	26.810	50.060	1.2690	18.630
1969.	11.150	46.270	26.970	50.310	1.3079	37.520
1970.	13.390	51.880	31.510	48.690	1.2594	37.050
1971.	10.270	50.650	34.400	49.970	1.1266	32.020
1972.	9.2000	46.780	37.048	50.420	.98440	29.350
1973.	8.4600	46.010	32.845	51.990	.96087	18.600
1974.	7.7500	69.590	84.280	52.170	.83110	120.33
1975.	5.7300	69.880	23.940	49.630	.85280	36.830
1976.	6.4400	69.580	25.460	50.120	.86470	25.620
1977.	6.5200	68.110	45.610	51.230	.85240	41.580

contd.

Group VI. Other non-manufacturing industries.

year	dividends	profits	investment demand	capital structure	liquidity demand	sales change
1951.	6.4000	22.030	9.5394	41.200	2.0800	70.450
1952.	6.0600	16.830	11.699	39.320	2.0700	47.300
1953.	5.1200	14.830	6.0540	37.160	2.1300	31.100
1954.	5.4200	15.250	20.290	40.540	2.0600	10.000
1955.	6.2700	16.620	19.386	42.230	1.5600	71.125
1956.	6.7500	24.310	31.510	47.460	1.4800	13.430
1957.	7.3000	26.340	20.452	49.120	1.5000	4.7340
1958.	7.3000	25.470	21.812	49.690	1.4400	8.4250
1959.	6.1500	24.490	15.591	50.350	1.4300	5.4490
1960.	6.2700	24.000	19.752	51.220	1.3900	20.350
1961.	7.7700	27.960	12.073	55.344	1.4200	11.920
1962.	7.4400	31.240	14.462	53.030	1.4500	30.750
1963.	7.3500	35.870	30.911	53.870	1.3700	35.250
1964.	8.5300	37.820	22.116	60.670	1.3600	32.990
1965.	8.6000	40.840	36.375	62.960	1.3600	39.130
1966.	4.6500	33.470	40.276	71.950	1.0900	41.050
1967.	5.4600	35.920	47.133	70.380	1.0300	51.037
1968.	6.4200	37.010	17.551	67.230	1.0700	34.440
1969.	6.4600	37.720	16.085	67.950	1.1200	52.620
1970.	7.0200	42.830	23.013	70.320	1.1300	59.970
1971.	7.9100	45.940	51.699	73.520	1.1500	58.038
1972.	8.3300	46.370	63.043	79.690	1.0800	67.800
1973.	8.6900	54.450	60.474	58.500	1.0000	74.992
1974.	9.8900	66.080	44.447	61.670	.97000	197.05
1975.	9.2700	79.440	27.772	65.540	1.0400	14.420
1976.	9.5500	75.320	56.745	69.520	.88000	32.540
1977.	9.6900	74.350	35.703	68.560	.89000	35.550

Notes: for details regarding the computation of these variables see p.122 (Ch.IV.)

Source: Reserve Bank of India. Financial statistics of joint-stock companies in India. Vols. I, II, III, as well as Reserve Bank of India Bulletin, December 1979.

Chapter IV

CONCLUSIONS.

The study had been an empirical exploration of tax impact on dividend behaviour in India. The empirical results show that tax differentiation is a very powerful instrument to control dividend preferences and that Indian corporate sector is very sensitive in this respect, particularly the manufacturing sector. The findings all the more emphasise the need for cautious administering of this medicine.

The study as such, is abstained from probing into the ethical aspects of controlling dividend decisions. A mention of the various arguments for and against such controls has already been made in the introductory chapter. To examine the need for such controls, one should have a perspective much broader than this study, because the need inevitably depends upon the over-all objectives of development planning, the investment policy, the incomes policy, and so on. The purpose of this study, on the other, is only to provide policy makers with a clearer view of the likely response to their actions in this respect, whichever may be the direction of such actions.

Even so, if one were to take a stand, one is likely to agree with the concensus reached in this regard by enquiries such as the Bhoothalingam Committee, that corporate dividend decisions should be better left outside the purview of government controls. The objectives, namely, raising investment, encouraging internal financing and reducing incomes' inequality and conspicuous consumption by dividend receivers, are no doubt desirable, but dividend controls seem to be no answer. For one thing, as proved by the past empirical findings, investment, capital budgeting, and dividend decisions are not as much interdependent as one would expect for affecting changes in the former via dividend controls.

The results of our study partly subscribe to the same view. It shows that investment demand is an important factor affecting dividend policies. But this does not necessarily mean that dividend controls are needed to induce new investment. Whether there are controls or no controls on distribution of dividends, companies would have gone for dividend cuts were there exist such a necessity. Also in our study the variable representing capital structure often turned-out to be less compelling, which would mean that artificial reduction of the cost of internal financing is not the main reason for dividend cuts. The effect of the excess dividend taxes, whose objective was explicitly to compel firms to plough back profits, has not proved to be very important. Though the study by itself is inadequate to come to any strong conclusions in this respect, if the results are combined with the findings of the past studies, the conclusions inevitably would be the same as above.

The other main objective of dividend restrictions is to reduce incomes' inequality. This argument also proves to be futile when we realise firstly, that dividend incomes by themselves are not that important to disturb the existing pattern of income distribution. Even if they are so, the ill-effects on incomes' equality can be much more efficiently tackled by monitoring the pattern of new share issues by companies rather than taxing dividends. Already such controls on share allotments exist. Once such monitoring is ensured, any increases in dividends would be accruing more and more to middle and lower income groups. Further a rise in dividend rate relative to those on alternative but less productive investments, might as well spread the habit of investing in company shares which might alter the incomes pattern.

Moreover there is a need to maintain the freedom of investors to diversify their investments in more efficient ways. Such an atmosphere will result in the long-run, more efficient allocation of savings in the economy.

All this reasoning points out a need to reduce the present degree of tax differentiation between distributed and undistributed profi which can be sought in two ways; either by suitably changing the tax system or by altering only the rate-structure without disturbing the over all system.

Among the income tax-systems adopted in the world today, Classical system is no doubt, simpler, more efficient, and administratively less cumbersome, compared to other systems. However, from the point of equity considerations as well as from the point of industrial development the Classical system is inferior to others such as Imputation or Full-integration systems. Even so, it is not advisable to switch over to the other systems as they definitely involve tedious assessment procedures and consequent delays. Also the transition from one system to another cannot be expected to be smooth, a point clearly brought out by this study. Therefore, there is no going back from Classical system.

But what can be done perhaps, is to reduce the present personal tax rates on dividend incomes. From the revenue point, the tax revenue from this source of income alone is not as much as to upset the government expenditure programs. At present there already exist certain reductions in the form of straight deductions for dividend incomes. But a more equitable way of reducing the tax burden would be to prescribe a seperate schedule for dividend incomes with lower marginal rates.

The 'schedular' system is not new to India. It existed in the form of seperate rate schedules for 'earned' and 'unearned' incomes. But that system descriminated against 'unearned' incomes

which included dividends. More appropriate would have been prescribing lower tax rates for dividend incomes. As can be seen in our empirical analysis much of the tax effect on dividends is due to personal taxes, and the over all sensitivity of companies to such taxes had been rather high. Therefore, reduction of personal marginal rates ondividends will go a long way in contributing to the industrial development, particularly the manufacturing sector.

Negative methods such as levy of excess dividend taxes at company level are, besides making the tax structure complicated, may not be effective. Positive methods of reducing tax rates on dividends certainly will. The tax reductions will make investments in corporate shares more attractive and will be conducive to the habit of investing in company shares thereby making more savings availa which seem to be a natural way of increasing the investment rate in the economy. If at all private sector has to be preserved in this country, the best form undoubtedly is the joint-stock corporation with increased public participation.