Chapter III

TAXATION AND DIVIDEND BEHAVIOUR: A REVIEW OF LITERATURE

In the previous chapter, we have been able to identify some of the elements in the Indian tax system that are likely to have affected corporate dividend policies in the past. Proper assessment of these tax elements is difficult unless we quantify the severity of their impact on dividend policies. To do so in a suitable manner, it is important to understand exactly how taxation interferes with dividend decision mechanism and induces firms to pay higher or lower dividends as the case may be.

This is what we intend to do in the following chapters — to understand and rationalise the tax impact on dividend behaviour. In this chapter we shall scan through some selected literature on the subject. In the next chapter we shall rearrange these thoughts more coherently into a model suitable for the Indian setting, which will enable us both to quantify the tax variables as well as to test for their impact.

Though taxation has been recognised as one of the important factors affecting dividends ever since dividend decision itself was
identified as "the primary and active decision variable in most situations", collection of empirical evidence on tax impact had not gathered momentum until the late sixties. Interestingly, in later years the trend in the dividend literature has been clearly in favour of studying the tax aspects. So much so, many of the studies treated factors other than taxes as secondary. Much of this later preoccupation with tax impact owes its origin to some attempts in the United Kingdom, on the part of Government to interfere with the existing tax balance between dividends and retentions, which we already described in the previous chapter. Nevertheless, it is also equally true that the preoccupation is also a reflection of the fact that governments in more and more countries are showing concern over this aspect.

In reviewing the past studies, we do not propose to cover the entire literature on dividend behaviour. Apart from the fact that comprehensive reviews on many aspects of the literature already exist and nothing more can be added except updating them, perhaps, our attention can more profitably be concentrated on studies concerned with tax impact. However, as a brief background of the essential characteristics of dividend behaviour, we shall review a study by Lintner, which is still regarded as a landmark in the growth of
dividend literature. We shall also examine some of the previous empirical attempts testing its relevance in India.

1. Lintner's model and its relevance in India.

On the basis of interviews and detailed analysis of a selective sample of 28 US companies over a seven-year period, Lintner postulated a rather simplistic behaviour model in which current dividends were primarily determined by past dividends and also by current earnings. According to Lintner, the problem facing managements of firms in determining dividends is not as to how much of current profits should be distributed as dividends, nor at what rate (in terms) of capital. The problem is primarily with regard to whether there should be a change in dividend payments at all, and if there should be, how large the change should be.

The reason according to Lintner, seems to be a belief on the part of managements that most stockholders prefer a reasonably stable dividend rate. Managements therefore, try to avoid 'temporary' revisions in dividends even under favourable conditions unless they are sure of the sustainability of such conditions.

Lintner also specified the mechanism of dividend change as follows: "The principal device used to achieve this consiste..."
pattern was a practice or policy of changing dividends in any given year by only a part of the amounts which were indicated by changes in the current financial figures. Further partial adjustments in dividend rates were then made in the subsequent years if still warranted. As a result, dividend distributions tend to be less erratic compared to other 'financial variables'.

Lintner was also very specific about the other 'financial variables' or 'favourable' conditions. He recognized that current earnings as the only factor which is 'reasonably persuasive if not compelling', to induce a change in dividends from past practices. He argued that managements generally "believe that unless there were compelling reasons to the contrary their fiduciary responsibilities and standards of fairness required them to distribute part of any substantial increase in earnings to the stockholders." Nevertheless, he believed that the other 'compelling reasons' are less regular and less understood and therefore, dividend changes are induced by only net earnings.

The model specified by Lintner is as follows: First, a 'target' or 'desired' level of dividends is determined as

\[ D_t^* = rP_t \]  \hspace{1cm} (3.1)
where \( P_t \) is current year's profits after taxes and \( r \), the target pay-out ratio. The 'inertia' mechanism by which current dividends are partially adjusted to desired dividends is

\[
\Delta D_t = a + c \left( D^*_t - D_{t-1} \right) + u_t
\]

where \( \Delta D_t \) is the change in dividends and \( D_t \) and \( D_{t-1} \) are the amounts of dividends paid in the years indicated by the subscripts \( t \) and \( t-1 \). The parameter \( c \) indicates the fraction of actual dividend change \( \Delta D_t \), in the desired change. The constant \( a \) was assumed to be positive to reflect greater reluctance to dividend reductions than to dividend raises, a tendency observed by Lintner in his sample companies.

Lintner found further empirical support to his model by testing it against time-series aggregate data pertaining to all US companies over the period 1918-51 and by obtaining "excellent correlations, random residuals, and highly significant regression coefficients over the entire period, 1918-51, and all major sub-groups of years."\(^5\)

The phenomenon of current dividend payments being dependent upon past dividend practices was, it should be noted, observed even earlier by Dobrovolsky\(^6\). But the basic contribution of Lintner's
study was the glorification of this aspect by considering past dividends as 'the primary' determinant of dividends as well as the rationalisation of 'dividend inertia' mechanism in terms of 'partial adjustment.

Much literature has 'flown in the academic river' since Lintner's study. Though his basic postulation of current dividends being dependent on past dividends and profits remained intact by and large, the model has undergone improvisations in many directions. One of the basic shortcomings of Lintner's study repeatedly pointed out later by Tarshis, Brittain, and Sastry was the oversimplification of dividend behaviour by ignoring factors other than net earnings and past dividends. Lintner himself was aware of this fact but he was convinced that other considerations are "less generally known, less widely understood and sympathetically recognised by stockholders as factors which should have an important bearing upon dividend distributions. Moreover, no other consideration was important year by year and company by company." Nevertheless, the later studies did prove that several other factors, particularly firms' investment needs, liquidity position, financing pattern, taxes, as well as growth prospects of the firm also play a significant role in determining dividend changes. Studies such as Sastry, Krishnamurty and Sastry went a step further and tested for interdependency between dividends, investment and external financing decisions of firms.
Also the mechanism postulated by Lintner that produces the 'dividend inertia' was found to be not unique. Alternative mechanisms and rationalisations were proposed and tested by Darling and Prais. Darling suggested a lagged profits hypothesis by expressing the change in the target pay-out ratio as a fraction of change in the net profits variable. This hypothesis was also adopted by Balopoulous in his fiscal policy model of the British economy. Prais proposed an adaptive expectations mechanism by which dividend change depends upon a change in firms' expectations regarding future earnings. However, these finer differences in rationalising intertemporal adjustment behaviour of dividends could not be resolved so far as many of the commonly used econometric tools are found to be inadequate to bring out these differences.

Further, there has been a marked improvement in the estimation techniques adopted by the later studies. Lintner used the Ordinary Least Squares method which is rather inadequate in fitting equations of this type, containing lagged dependent variables as explanatory variables. The bias could be devastating in time-series regressions which are further prone to auto-correlation. A number of alternative methods are now available which help to minimise the errors in estimating the model.
The other points of criticism against Lintner's study relate to such matters as to whether 'cashflows' or 'gross profits' would be a better approximation than 'net earnings' used by Lintner (with or without inventory gains) to represent firms' 'capacity to pay' dividends, or whether the relevant rate of dividends should be in terms of paid-up capital or networth, and so on. These in our opinion, by and large depend upon particular circumstances and situations and cannot be generalised.

It would be useful to examine the applicability of Lintner's model in India, by glancing through some of the empirical studies that used the model to explain the dividend behaviour of Indian corporations, as we too will be using this model though modified in a different way.

**Testing of Lintner model in India.**

A number of these studies tested different versions of Lintner's model in the Indian context. Some of them were content with testing of the model with little or no alterations, while others substantially modified it. The modifications range from mere inclusion of new factors to specifications in terms of sophisticated interdependence systems. Between them they tested the model in a variety of ways: based on time series -- aggregate, industry-wise,
As well as micro firm-wise; cross-sections — annual as well as those obtained by averaging firm-wise data for a few years; and pooled time-series and cross-section observations. And between them they covered roughly thirty years of the post-Independence period.

Among these studies, Rao and Sarma provided a preliminary testing of Lintner model based on aggregate time-series (1955-56 to 1965-66) data published by Reserve Bank of India, pertaining to, (a) all companies (public limited as well as private limited); (b) four major industrial groups — agriculture and allied activities, mining and quarrying, processing and manufacturing of metals and chemicals and their products; as well as ten selected industries in public limited sector. They tested three variants of Lintner's equation; first, with profits net of taxes and lagged dividends as explanatory variables; second, with net cashflows substituting net profits; and third, with depreciation entered as a separate explanatory variable rather than as part of the capacity variable. The results show that Lintner model adequately explains the dividend behaviour of Indian corporations. Cashflow was found to be more appropriate approximation of the capacity variable for industries
such as cotton textiles, iron and steel, paper, electricity generation and supply, whereas depreciation had a separate effect in the case of jute textiles and engineering industries.

Studies which have extended the basic Lintner model to include other factors reached varied conclusions about their impact. Swamy and Rao analysed the time-series data on manufacturing companies over 1954-55 to 1974-75 and they seemed to be in favour of the conclusion that investment expenditure has a positive effect and external finance has a negative effect, though the effect was small. The 'positive' effect of investment factor is somewhat inexplicable. Generally, given the financing possibilities, higher investment demand 'depresses' the dividends. Therefore, investment demand can either have a negative or no effect.

Probably the earliest and one of the most detailed testing of Lintner as well as other dividend behaviour models was a study by Sastry. Using annual cross-sections of 389 companies covering the period 1955-50, he improved Lintner's specification in several ways. First, he tested various alternative definitions of the capacity variable and concluded that gross-profits (profits net of taxes + depreciation provisions + changes in the tax reserves) was the best. Secondly, he incorporated other factors
in the model and found investment demand is particularly significant
in making dividend decisions. Thirdly, he examined alternative
rationales for the dividend 'inertia' and showed that explanations
other than Lintner's would lead to equations which are difficult
to estimate by linear methods. Finally, and more importantly
he realised that there is a marked interdependence between dividends
investment and external financing decisions.

The study made by Krishnamurty and Sastry can be regarded
as the most extensive and exhaustive work so far, on dividend
behaviour in India. They tested an equation in which dividends
were expressed as a function of gross profits net of taxes, lagged
dividends, investment expenditure (gross fixed + inventory investment)
and the flow of external debt. They used alternative sets of data —-
(a) pooled cross-sections of about 360 companies, roughly covering
the years 1961-62 through 1967-68, (b) time-series RBI data, as
well as (c) micro, firm-wise time-series data; all the three sets
pertaining to seven major industries; cotton textiles, jute, sugar,
paper and paper-board, chemicals, engineering, and cement. The
coefficients were estimated by single equation as well as within an
interdependent frame of the 'triad' decisions, namely dividends,
investment, and external finance.
They found that in five out of seven industries, the impact of investment demand and external finance factors on dividends was absent. The exceptions are jute and cotton textiles. On the basis of the RBI time-series they found that even current profits is not significant in three industries; sugar, paper and paper-board, and cement, indicating the applicability of a more 'puritanic' version of Lintner model. Where these other factors tended to be significant, the study observed; "Investment expenditure has a depressing effect on dividend disbursals in the same industries where external finance has a supporting (positive) influence."

We now summarize the broad consensus reached by these studies. Despite the use of different data sets, specifications, methods of estimation, there is a striking similarity about the conclusions. Firstly, all the studies were of the view that the simple Lintner model, specifying dividends in terms of a 'capacity' variable and lagged dividends is an adequate description of the dividend behaviour of Indian corporations. Secondly, the evidence broadly supports the approximation of the 'capacity' by cash-flows rather than profits net of depreciation. However, the empirical evidence seem to be not in favour of significant influence of other factors, supporting Lintner's own contention.
The factors employed by the above studies to explain dividend behaviour are not exhaustive. At best these factors represent the financial side of the story. The other side, representing the preference factors which operate even in the absence of sufficient demand-side inducement, has been left out. Lintner, while postulating his model, assumed that the target pay-out ratio (the coefficient of the capacity variable) embodies the influence of all other factors, by which he meant that managements sufficiently plan ahead about the implications of these factors. He might be correct in so far as managements can 'plan ahead' and in fact, it is this point that has been demonstrated by the absence of the influence of these financial factors, not only by studies conducted in India, but also studies in other countries as well, such as the one by Brittain. But there are certain factors the managements cannot 'plan ahead', in any case, not in India. These factors operate through taxes. Taxes, both on companies as well as on shareholders, are capable of inducing a change in the preference patterns for dividends, whether there is a need or not. It is true that Lintner also noticed the tax factors and dismissed them because the "primary effect of taxes on the volume of net corporate savings results from their impact on the magnitude of net earnings." The primary effect considered by him was what later Brittain described and estimated as 'tax depression effect'. The effects of taxation, however, is not limited to only depression effect. The other effect due to
'tax differentiation' between dividends and retained profits is increasingly being utilised by governments to encourage corporate savings, despite the fact that increased savings may or may not result in higher investment efforts. Thus, there is a need to separate-out from the target pay-out ratio, another set of factors affecting the mere preferences of companies for dividend changes. Realising the importance of taxes and the varied ways in which they affect dividend behaviour, later developments in the literature entirely concentrated on studying the tax impact. It is to these studies we shall now turn our attention.

2. **Studies testing tax impact on dividend behaviour.**

Among these studies we shall consider Brittain, Feldstein, Moerland, and King, which marked the development of literature in this direction.

One of the earliest studies to recognise tax effects on dividends explicitly, was that of Brittain. His was a time-series analysis of US companies over a 40-year span, 1920–1960 (excluding World War II years). He used Lintner's equation but retained in its original first difference form, presumably to minimise the lagged dependent bias. The equation specified was
\[ D_t - D_{t-1} = a + c \left[ rY_t - D_{t-1} \right] + u_t \]  

where \( D_t \) and \( D_{t-1} \) are current and lagged dividends, \( Y_t \), the capacity variable (cash-flow net of taxes), \( c \) and \( r \), the parameters representing the speed of adjustment and long-run target pay-out ratio, and \( u_t \), the random factor. Also in an attempt to isolate the impact of other factors, Brittain considered depreciation, investment demand, individual taxes, interest rates, sales change, and corporate liquidity as the main factors affecting dividends. Of particular interest are the tax factors.

Brittain considered two types of effects taxes can exert on dividends. One is a 'depressing' effect as a result of an overall increase in the corporation tax, and the other, due to a 'shelter' provided by retained earnings from individual income taxes.

He realised that an increase in corporation tax that is not completely shifted reduces the pay-out base and thus undoubtedly has a depressing effect. This is in line with Lintner's observation cited above. But the tax depressing effect may not be equally borne between dividends and retentions. In Brittain's words; "... such a tax increase could actually raise the after-tax pay-out ratio since
it cuts the profitablity of investment and rules-out marginal projects; in this situation dividends might be maintained without additional resort to external financing. Finally, it is also possible that a large tax increase might be passed along in the form of dividend cut by firms insistent (perhaps irrationally) upon a fixed level of savings or of resources.  

To test the 'depression' effect, Brittain included pre-tax income and taxes, separately in his equation but found no evidence for the 'substitution' effect. Therefore he concluded that an increase in taxes reduces only the level of dividends but not effect the pay-out ratio.

More important is Brittain's analysis of the other effect through individual taxes. Retained earnings provide a tax 'shelter' from personal income tax and therefore, a rise in the personal income tax rate would induce shareholders to prefer lower dividends. An offsetting effect could be due to personal capital gains tax, since corporate retentions when realised as capital gains may also be liable to tax. Brittain hypothesised that the dividend pay-out ratio varies inversely with the differential between personal income tax and capital gains tax. However, he realised that the hypothesis to
hold, several conditions need to be satisfied. Important are:
(a) that a substantial number of shareholders should be sufficiently 'sophisticated' to recognise the tax savings via retentions,
(b) that capital gains tax rate should be sufficiently lower than income tax rate so that the lag in dividends will be more or less compensated later, and (c) managements should have sufficiently close liaison with their shareholders to take their preferences into account in making dividend decisions.

To test this hypothesis, Brittain proxied the 'differential' as
\[ T = \frac{(1 - t_g)}{(1 - t_y)} \]
where \( t_g \) and \( t_y \) represented the rates of capital gains and individual taxes. He preferred this to the earlier alternative measures suggested by Gordon as \( \frac{t_y}{t_g} \) and Bailey as \( t_y - t_g \), as Brittain expected that his measure would bring-out the increasing preferences for retentions as shareholders move to higher income groups. The respecification of Brittain's dividend equation containing \( T \) is

\[ D_t - D_{t-1} = a + c \left[ (\alpha + \beta T) Y_t - D_{t-1} \right] + u_t \quad - (3.4). \]

Brittain tested this equation with alternative definitions of \( T \), with and without \( t_g \), as well as on the basis of several approximations of \( t_y \) and \( t_g \). He found that the shelter variable carried the expected
negative coefficient and was highly significant. However, equations containing capital gains tax gave generally poorer performance than those excluding it. Thus, he was inclined to conclude that this might be the 'economic reality'. "It is possible that individuals and corporate officials who think in terms of tax avoidance via low pay-out may be unconcerned with the tax bite attending ultimate realisation". This conclusion was supported more or less, by disaggregated analysis as well. It is also interesting to note that factors other than cash-flow and tax differential, generally remained insignificant. Thus, Brittain's study showed that tax factors could be another 'reasonably persuasive if not compelling' factors in altering dividend decisions.

Also of interest was his respecification of Lintner model to assess the tax impact by expressing \( r = \alpha + \beta T \). This type of specification is particularly suitable to measure the tax effects since tax factors operate mostly via pay-out ratio. However, Brittain's extension of the same type of specification even for other demand-side factors is, in our view, rather exaggerating the role of pay-out ratio. Further, Brittain's study implicitly assumed a 'Classical' type of income tax system and thus, ignored the other component of tax differential caused by taxation at company level itself. Later studies filled this gap as well.
Feldstein concentrated on this aspect and attempted to take into account the corporation tax differential as well, in particular that caused by the British differential profits tax on dividend policies of British companies.

In doing so, Feldstein used a slightly more generalistic version of Lintner model. The desired or 'optimum' dividend function was specified as

$$D^*_t = A Y^a \theta^b U_t$$  \hspace{1cm} - (3.5)

where $D^*_t$ denoted the desired level of dividends, $Y$ and $\theta$, the income and tax differential variables respectively; $a$ and $b$, 'elasticities' of $D^*_t$ with respect to $Y$ and $\theta$ respectively, and $U_t$, a random disturbance variable. Thus the target pay-out ratio of Lintner model is split now into; $A$, a constant component and $\theta^b$, which varies with tax differential whose 'response' or elasticity is $\theta$ (not necessarily being unity). The variable $\theta$ was defined as 'tax opportunity cost of retained earnings in terms of dividends' which was similar to Brittain's definition of 'tax shelter' variable. The partial adjustment equation was also suitably modified to be 'compatible' with the above equation, which is

$$\frac{D_t}{D_{t-1}} = \left[ \frac{D^*_t}{D_{t-1}} \right] \lambda v_t \hspace{1cm} 0 < \lambda < 1$$  \hspace{1cm} - (3.6)
where $\lambda$ was the response elasticity similar to Lintner's 'speed of adjustment' and $V_t$, a stochastic term. The model was fitted to quarterly aggregate time-series data on British companies over the period, January 1953 through December 1964 (about 44 observations).

In an attempt to obtain more consistent estimates, the model was estimated by three other alternative methods along with the OLS method; Liviatan's Instrumental Variables (LIV), Quasi-Generalised Least Squares (QGLS) by assuming alternative forms of serial correlation), and Augmented Least Squares (ALS).

The main findings were that, (a) the impact elasticity with respect to a tax-induced change in the opportunity cost was less than unity and highly significant, and this state of affairs was irrespective of the method of estimation, (b) the OLS estimates were biased downwards as shown by using LIV method, and (c) the income elasticity was close to unity and did not differ significantly whether the 'capacity variable' was defined as profits net of taxes and net of depreciation or gross profits.

Feldstein also extended the specification of the desired dividend function; (i) to test for permanent income hypothesis
(similar to Prais and Darling) by expressing

\[ y_t^a = y_{t0}^a \left( \frac{y_t}{y_{t-1}} \right)^{a_1} \] - (3.7)

(ii) to allow for possible effects of expectations regarding \( \theta \), by expressing alternatively,

\[ \theta_t^e = \theta_{t0}^e \left( \frac{\theta_{t+1}}{\theta_t} \right)^{\beta_1} \] - (3.8),

\[ \theta_t^e = \theta_{t0}^e \left[ \frac{\theta_{t+1}}{\theta_t} \right]^{\beta_1} \left[ \frac{\theta_t}{\theta_{t-1}} \right]^{\beta_2} \] - (3.9),

and, (iii) to allow for the possible 'substitution' effect of a rise in the overall corporation tax rate by introducing a variable \( \Pi_t \), defined as a ratio of maximum net profits to gross profits.

He found on the basis of these extensions, (i) that permanent income hypothesis could be less plausible explanation for dividend inertia, and (ii) that allowing for more complex dynamic dividend behaviour did not weaken the effect of differential profits tax on dividend behaviour. However, the evidence regarding the 'substitution effect' of \( \Pi_t \) was inconclusive though his industry-wise analysis provided some in favour of such effect.
It may be pointed out that in this more general specification of $D^*$ function, two features are conspicuous by their absence: (a) factors affecting dividends other than income and taxes, and, (b) the constant term of Lintner model.

The absence of other financial factors could be due to the earlier empirical evidence against their significance. Also, these factors are prone to affect dividends independently of the target pay-out ratio and therefore, more plausibly (but not necessarily) enter the $D^*$ equation linearly. This would have presented more difficulties in estimation of the equation which was already plagued with lagged dependent bias and inconsistencies due to time-series. The introduction of these factors would have enormously increased the computational burden. In a latter paper, Feldstein did try to introduce a variable representing tax savings due to investment incentives but found the effect insignificant.

Regarding the second feature, it is true that Feldstein's model does not allow the testing of the Lintner's hypothesis of greater reluctance to dividend cuts than to dividend increases. The constant term in the Feldstein's model is part of target pay-out itself. Despite these difficulties the specification is preferable to test the tax effects.
The two studies examined so far recognised the potential tax effects and the way in which they effect dividend behaviour, largely based on intuitive rather than theoretical reasoning. Lack of a strong theoretical reasoning apparently led to controversies such as the one between Feldstein and King.\textsuperscript{25} The later studies endeavoured to provide a rigorous theoretical backing as to how exactly taxes should enter the dividend model and what modifications are needed and so on. These are Moerland and King.

Moerland's study entirely concentrated on theoretical aspects of dividend behaviour. He assumed an objective 'utility' function containing dividends and retained profits as the elements and that maximisation of the function was assumed to be equivalent to maximisation of the market value of a firm. This utility function is analogous to consumer's utility function of two commodities or an iso-product function of a producer. The form of the 'utility' function specified was similar to the one proposed by Keller\textsuperscript{26}, in the context of production functions, which was a generalisation of the conventional Constant Elasticity of Substitution function (CES).\textsuperscript{27} The modified CES function (MCES) is

\[
\begin{align*}
u = \left[ \psi^2 \left( \frac{D}{\Delta} \right)^{-\rho} + \beta^2 \left( \frac{R}{\delta} \right)^{-\rho} \right]^{-1/\rho}
\end{align*}
\text{--- (3.10)}
\]
where $u$ is the utility level, $D$, dividends net of taxes, $R$, retentions net of taxes, $\gamma$ and $\phi$ are the distribution parameters and $\rho$, the substitution parameter.

Maximisation of $u$ however, is constrained by the profit allocation function,

$$P = \frac{D}{(1-a)(1-b)} + \frac{R}{(1-b)}$$  \hspace{1cm} -(3.11),

where $P$ denotes total profits, and $a$ and $b$ denote the tax rates and therefore, $1/(1-a)(1-b)$ and $1/(1-a)$ denote 'tax prices' of $D$ and $R$ respectively. These 'tax prices' were denoted as $p_D$ and $p_R$.

From the first order conditions of the constrained maximisation, Moerland derived the 'optimal' levels of $D$ and $R$ as follows.

$$D^* = \frac{\sigma^{\sigma + l - \sigma}}{p_D} P/[ \frac{\sigma^{\sigma + l - \sigma}}{p_D} + \frac{\gamma^{\sigma + l - \sigma}}{p_R}]$$  \hspace{1cm} -(3.12)

$$R^* = \frac{\gamma^{\sigma + l - \sigma}}{p_R} P/[ \frac{\sigma^{\sigma + l - \sigma}}{p_D} + \frac{\gamma^{\sigma + l - \sigma}}{p_R}]$$  \hspace{1cm} -(3.13)

$$\sigma = 1/1+\rho .$$

Moerland thus emphasised that the impact of taxes on $D^*$ depends on not only the elasticity coefficient $\sigma$ but also on other distribution parameters of the objective function of firm.
He also examined three interesting degenerations of MCES function, namely (i) the Cobb-Douglas type where $\sigma=1$, (ii) the general Leontief type where $\sigma=0$, and (iii) a linear utility function where $\sigma=\infty$, and obtained the corresponding optimal dividends which are as follows.

(i) $\gamma^2 p/(b^2+\gamma^2) p_d$ \hspace{1cm} - (3.14),
(ii) $\gamma p/(b p + \gamma p_d)$ \hspace{1cm} - (3.15)
(iii) $0$ if $p_R\gamma/p_D b<1$ and,
\[ p/p_d \text{ if } p_R\gamma/p_D b>1. \] - (3.16).

These $D^*$ functions when used in conjunction with the partial adjustment function (equation 3.6) yield the corresponding reduced forms to be estimated.

Moerland also analysed the 'comparative statics' implications of his model by deriving partial elasticities of $D^*$ and $R^*$ with respect to 'price' changes and, more specifically with respect to tax rates under three income tax regimes; the Classical, Split rate, and Imputation systems. The interesting point is that the theoretical results obtained by Moerland were in agreement with those discerned by earlier two empirical studies. Also, the specifications of dividend
models in the earlier studies were none but the results of different assumptions regarding the shape of the objective 'utility' function. For example, the Cobb-Douglas type of objective function gives rise to the type used by Feldstein.

King's analysis was also on similar lines though independent of Moerland's work. He first redefined the tax liability of a firm in a general form as

\[ T = \tau Y + G \left[ (1-\theta)(1-m)/\theta \right] \]

where \(T\) denoting the total tax liability, \(Y\), taxable profits, \(G\), dividends gross of personal income tax, \(\tau\), tax rate on undistributed profits (equivalent to the 'basic' rate under Classical system), and \(\theta\), the tax discrimination variable defined in the same way as in Feldstein. This definition of \(T\) led to the derivation of 'tax prices' as

\[ p_G = (\hat{\theta} \Pi)^{-1} \quad \text{and} \quad p_R = \Pi^{-1}, \quad \hat{\theta} \text{ being } \theta/(1-m) \quad \text{and} \quad \Pi = 1-\tau \]

which incidentally was the same as Feldstein.

Next, to simplify the constrained maximisation, King used an indirect 'utility' function \(U(G, R)\), the advantage being that such a function embodies the optimisation in itself and thereby facilitates handling of more complex specifications than can be managed with the direct utility function. He defined such a function as \(g(v_G, v_R)\),
where $v_G$ and $v_R$ denote the 'normalised tax prices' defined as $(\theta \Pi_Y)^{-1}$ and $(\Pi_Y)^{-1}$ respectively.

To obtain a concrete solution, specification of the 'reciprocal' of $g(v_G,v_R)$ was needed. A generalised quadratic homothetic quasi-concave form suggested by Denny for production function theory was adapted as the reciprocal indirect utility function which is

$$h(v_G,v_R) = \{\sum_{i,j} v_{ij}^{\beta} (1-\gamma)\}^{1/\beta} \tag{3.18}$$

where $i,j \in G, R; a_{ij} \geq 0$ for $i \neq j; 0 \leq 1$ and $0 \leq \gamma \leq 1$. These restrictions are needed to make $h(v_G,v_R)$ quasi-concave and homothetic. The utility function adapted by King was more general than the MCES used by Moerland.

Next, using a property of the linear homothetic functions he derived

$$G / R = f(\hat{\theta}) \tag{3.19}$$

($\hat{\theta}$ being $v_G/v_R$) which when combined with the budget constraint and with the partial adjustment equation of Feldstein, yielded the following form

$$\log G_t = \lambda \log P_t + \lambda \log q(\hat{\theta}) + (1-\lambda) \log G_{t-1} + u_t \tag{3.20}$$

where $P_t = \Pi_t Y_t$ and $q(\hat{\theta})$ a function of $\hat{\theta}$, and $\lambda$ being the same as above.
This more general form was degenerated into two specific forms namely, the Cobb-Douglas and the CES forms by imposing further restrictions on the \( h \)-function. The Cobb-Douglas specification yielded the linear form similar to Feldstein, whereas the CES form led to a non-linear estimation function.

King fitted the two functions on UK companies data, with alternative assumptions regarding the stochastic error distribution, over a period covering approximately 1950-7]. He also introduced a factor representing company 'take-over activity' to measure the sensitivity of managements in responding to shareholders' preferences. His main findings were that in the linear model the income-elasticity was close to unity, cash-flows performed better and the tax variable generally was significant. More important was his finding that specification of dividend equation has an important bearing on the estimates. His non-linear estimates showed that the 'response' coefficient of the tax differential variable was far less than unity suggesting a specification bias in the linear model.
The above review provides some glimpses of the existing literature on dividend behaviour as well as tax impact on dividends. It shows that substantial progress has been made in rationalising and theorising the dividend behaviour and associated tax impact, as well as in improving the estimation methods. Against this literary background and in view of the numerous tax changes concerning dividends, the lack of empirical studies in India in this direction is all the more glaring.
Notes and References.


2. for such reviews, see


4. Ibid. p.100.

5. Ibid. p.100, and p.109.


12. A review and testing of these alternative models can be found in Brittain, J.A. (1966) and Sastry, V.K. (1968). op.cit.


22. Mentioned by Brittain. Ibid. p. 84.

23. Ibid. p. 88.

24. Incidentally, a similar specification was also tried by Krishnamurty and Sastry when they related firm-wise target pay-out ratios to some firm-specific factors. See Krishnamurty, K. and Sastry, D.U. (1975). op.cit. pp. 116-128.

25. See, King, M.A. (1971), Feldstein, M.S. (1972), and King, M.A. (1972). op.cit. The controversy was over the correctness of the specification. It was apparently agreed that as net profits was endogenously determined by and large, a more correct specification should include, besides $I_t$, another term,

$$1 - \frac{1 - \theta}{\theta} \frac{D}{Y_t}$$

The discussion was quite illuminating in emphasising the need for correct specification of the model as well as the method of estimation.

26. Quoted by Moerland.