

Determinants of Corporate Saving in Pakistan: A Macro-econometric Analysis

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Firms' behaviour with respect to retention and distribution of profits has received little attention in developing countries. Against the background of previous research on the subject, mainly in advanced industrial countries, the paper attempts a multivariate regression analysis of retention of profits in Pakistan, using time-series data relating to the country's non-financial corporate sector. The results support the applicability to developing countries of many of the hypotheses concerning this aspect of firms' behaviour which have found support in empirical research in the more advanced economies.

I. INTRODUCTION

Corporate saving behaviour has received much less attention from economists than personal saving behaviour. The reasons for this appear to be both theoretical and statistical. On the theoretical side, the relative neglect of corporate saving behaviour appears to reflect the somewhat uncertain status of the corporation as a separate behavioural entity in much of early economic theory. Keynes's General Theory — which may be regarded as constituting the take-off point for serious theoretical and empirical research on the savings function — mainly emphasized personal saving behaviour, although it did note some possible differences in the motives for saving between individuals and business entities [22, Chap. 9]. It was not until the mid-1950s that savings (or dividend) functions relating to the corporate sector came to be formulated and tested on a significant scale. On the statistical side, the vagaries of accountants' definitions and variability of accounting procedures made economists remain for long rather sceptical of the relevance, reliability and comparability of company accounts. As a result, although corporate accounts have been available for a fairly long time, their use in empirical economic research is of a relatively recent origin.

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With the gradual development of the relevant theoretical base and the availability of improved and standardised corporate data, however, a sizable empirical literature on the subject has emerged over the last two decades. The findings of this literature about the factors influencing corporate saving and the differences between these factors and those relevant in the case of personal saving have been duly recognised and incorporated into other areas of research. The literature on economic growth theory is a case in point, where the distinction between personal and business saving has been recognised in several models by including separate functional equations for each.

However, research on corporate saving – or, more generally, appropriation of corporate profits – remains limited in developing countries. Most of the work that has been done is confined to a handful of countries and is of a fairly basic nature. While the lack of research may in many cases be a reflection of paucity of good quality data or of the smallness of the corporate sector relative to the rest of the economy, in many other cases this appears to be a result simply of a lack of sufficient interest in the subject. Pakistan appears to be a case in point: while data of reasonably good quality have been available for a large number of enterprises for some time, and the corporate sector now accounts for over 15 percent of the GDP, only a couple of studies in the country can be pointed out as relating to this area of research, viz., Haq and Baqai [16] and Amjad [1]. Furthermore, even these few studies have been concerned mainly with estimation and presentation of relevant corporate statistics rather than with any systematic behavioural analysis.

An attempt at such an analysis has been made in this paper with a view to identifying some of the major determinants of corporate saving in Pakistan. We examine how far the hypotheses developed mainly in the context of advanced industrial countries are applicable to a developing country, where the corporate sector is generally much smaller and the markets for loanable funds are less developed. The paper is organised as follows: Section II sets out some major hypotheses relating to firms' appropriation of profits and looks at the available empirical evidence. Section III deals with the data base and the method used in testing these hypotheses. The empirical results are presented and discussed in Section IV, while Section V summarises the main conclusions of the paper.

II. MAJOR BEHAVIOURAL HYPOTHESES

The basic variable determining corporate saving is corporate profit or income. Net profit is disposed of either as dividends or as retention in business, i.e., savings. Corporate savings functions tested in empirical studies have ranged from simple models positing a linear functional dependence of saving on profit to much more complex models including several additional explanatory variables. Among these,

one model that has attracted a good deal of attention is the partial adjustment model proposed by Lintner [26;27], which may be set out as:

$$D - D_{-1} = a + c(D^* - D_{-1}) + u \quad \dots \quad (1)$$

where $D^* = rP$; D and P stand for dividends and post-tax net profit respectively, and u is a stochastic error term.

The model pictures companies as having a 'target' (dividend) pay-out ratio (r) which, applied to current profit, determines the amount of dividend that they would ideally like to pay out of the current profit. Thus, if dividends were always fully adjusted to changes in profit, they would change by $(D^* - D_{-1})$ between periods $t-1$ and t . However, companies are generally unwilling to make large and rapid revisions in dividend payments, which means that dividends are adjusted only partially to the desired level during any single period. The magnitude of the partial adjustment is given by the 'speed-of-adjustment' coefficient ' c '.

The unwillingness to make large and rapid changes in dividends, according to Lintner, stems from managements' belief that shareholders desire dividend stability. This leads them to avoid making changes that may have to be reversed in a year or so, as further partial adjustments can take place in subsequent years if still warranted. This partial adjustment process has the advantage that a cushion of reserves is left with the company should profits later begin to decline. Elements of psychological and institutional inertia and general conservatism in management policies contribute to this behavioural pattern.

For estimation purposes, Lintner reduced relation 1 to the following form:

$$D = a + b_1 P + b_2 D_{-1} + u \quad \dots \quad (2)$$

where $b_1 = cr$ and $b_2 = 1 - c$.

It should be noted that the coefficients in the above relation can also be interpreted in terms of short- and long-run responses. The coefficient $b_1 (= cr)$ may be regarded as indicating the 'short-run propensity to distribute', since it measures the change in dividends in response to a unit change in current profit. If the unit change in profit is maintained, the total or long-run response of dividends is given by the expression:

$$b_1(1 + b_2 + b_2^2 + b_2^3 + \dots) = b_1 / (1 - b_2) = r \quad \dots \quad (3)$$

which may be regarded as the 'long-run propensity to distribute'.

A similar estimating relationship was employed by Dobrovolsky, though with a somewhat different behavioural rationale [8]. Among the factors promoting dividend stability, Dobrovolsky emphasised the notion that capital markets place a premium on stocks with a relatively stable dividend record. Another factor mentioned was the desire on the part of managements to retain control over their enterprises and their fear that large fluctuations in dividends might provoke opposition

from shareholders and a closer scrutiny of their decision making. Dobrovolsky posited that since companies were, as a result of such considerations, generally reluctant to change their dividend policy abruptly, the dividend paid during the preceding period could be taken as an approximation of the 'dividend requirements' for the current period. Using retained earnings, R , rather than dividends as the dependent variable, his estimating equation was of the following type:

$$R = a + b_1 P + b_2 D_{-1} + u \quad \dots \quad (4)$$

which is similar to Lintner's estimating equation, save for the substitution of R for D .

There are other behavioural rationales that also lead to an estimating relation similar to that employed by Lintner (equation 2); these focus on uncertainties which make current profit levels an imperfect guide to future profitability, and posit that companies tend to base their dividend policy on expected rather than current profits. In some studies, e.g. Prais [32], expected profits have been approximated by taking an average of past profits in a geometric lag scheme, the formulation reducing to equation 2 when simplified via the Koyck transformation. In some other studies, changes in expected profits have been approximated by an adaptive expectations model. On some algebraic manipulation, this formulation also reduces to equation 2; the formulation amounts to a transposition of Friedman's permanent income model of personal consumption/saving behaviour into a permanent income model of corporate dividend/saving behaviour. Examples of this approach are due to Fisher [12], Lancaster [24], Stone [38] and Hart [18].

The lagged dividends model has generally yielded good empirical results. No serious attempt, however, has been made to test the relative merit of the different behavioural rationales underlying the model. Most of the empirical studies have nevertheless relied on the Lintner-Dobrovolsky type reasoning.

Another model that stresses a lagged response of dividends to changes in profits involves regressing dividends on both the current and preceding years' profits. However, results obtained from the lagged profits model have been less consistent, in part due to the tendency for the current and lagged profits to be collinear: cf. Tinbergen [40]; Modigliani [29]; Dobrovolsky [8] and Smith [36].

Among the several other factors identified in the literature as possible influences on appropriation of profit, companies' investment demand has turned out to be significant in a number of studies, showing a positive correlation with retained earnings: cf. Smith [36]; Dhrymes and Kurz [6; 7]; Brittain [4]; and Krishnamurty and Sastry [23].¹ The rationale underlying the relationship is that companies may

¹Additional supporting evidence is supplied by some more general studies of corporate behaviour; a positive correlation between corporate growth/investment rate and the retention ratio is reported by Gordon [15, pp. 234-5] and Singh and Whittington [35; p. 182]. See also Turnovsky [41] for a different result.

regard internal funds as being cheaper than external funds, thereby tending to retain more and distribute less of their profits when their demand for funds for investment is high — say, as a result of expectations of high profitability. Investment and dividend outlays are thus seen as representing competing demands on profits. While in most studies the measure of investment used has been defined in terms of expenditure on plant and equipment (i.e., fixed assets), some studies, e.g. [8], have employed more inclusive measures that include some other types of asset growth as well — for example, the rate of growth of 'operating assets' (total assets less liquid assets such as cash and marketable securities) or, indeed, of all corporate assets.

Along with capacity expansion requirements, an increase in a company's working capital needs also makes claims on its profits in competition with dividend distribution and, therefore, can make for higher retention: cf. Darling [5]; Brittain [4]. Companies' reserve requirements may also influence their appropriation policy, especially in the case of companies experiencing substantial fluctuations in business. It is customary for managements to regard corporate surplus, i.e., reserve funds of various kinds, as a general financial cover against contingencies. While a strong reserve position is desirable, the motivation to continue to strengthen it would be expected to diminish as the surplus or reserve funds increased. Tinbergen [40], and later Modigliani [29] and Dobrovolsky [8], found corporate surplus to be associated positively with dividends and negatively with retained earnings. The same variable, however, turned out to be insignificant when used by Lintner [25] in his partial adjustment model.

A closely related hypothesis is that a firm's liquidity position will tend to be negatively associated with retained earnings, as a higher degree of liquidity will tend to encourage dividend distribution by enabling higher dividends to be paid without the firm running the risk of having to resort to external finance in case of an emergency. Different measures of a firm's liquidity position have been used in empirical studies — e.g., liquid assets, net current assets, etc. — and the results have been similar to those for the reserve requirements variable, significant in some studies and insignificant in others: cf. Darling [5]; Brittain [4]; Dhrymes and Kurz [6; 7].

Several studies have examined the role of taxation in the profit appropriation policy. In this respect, Brittain [4] has found that changes in the differential between tax rates on ordinary personal income (which includes dividend income) and capital gains can be a significant factor. Ordinary personal income is normally taxed at much higher rates than accruals from capital valuation changes. This differential provides shareholders with a way of tax saving (or what Brittain terms 'tax shelter') such that they are likely to let companies retain larger proportions of profits when this differential increases. This tax advantage can take different forms. If higher retention brings capital gains that are realised by the stockholder, there is a net saving in taxes paid because of the lower tax rates on capital gains. If capital gains remain unrealised at the time of the stockholder's death, they escape the income tax

completely even if they are later realised by his heirs. There will be tax saving also if higher retention leads eventually to an issue of bonus shares which carry lower tax rates than dividends. Finally, the stockholder has the advantage of tax deferral even if the extra funds retained today are ultimately paid out in the form of dividends.

As regards corporate income taxation, the general finding has been that the corporate income tax reduces the *level* of both dividends and retained earnings by reducing the volume of post-tax profit but has little effect on the *proportion* in which it is distributed between the two. This suggests that the effect of the tax is adequately taken into account simply by using post-tax profit as the key explanatory variable in the estimating equations: cf. Lintner [26]; Brittain [4].²

Another hypothesis that has found some support is that retained earnings tend to be positively related to the cost of external financing, as increases in the latter – e.g., interest rates on borrowed funds – tend to discourage dividend distribution by increasing the relative attractiveness of internally generated funds as a source of finance for the company's operations: cf. Brittain [4]; Johri [21]. Finally, in some studies the extent of companies' use of external finance has been included as an independent regressor. The availability of external finance enables companies to carry out their planned dividend payments when their combined requirements for funds are large relative to their budget constraints. Freer and easier availability of external funds – reflected in greater recourse to such funds – may, therefore, act to reduce pressures on them to distribute less and retain more for financing their investment and other needs: cf. Dhrymes and Kurz [7]; Krishnamurty and Sastry [23]; Snowden [37].³

III. DATA AND METHOD

The analysis of corporate saving behaviour in Pakistan attempted in the following section is essentially an application to Pakistan data⁴ of the hypotheses noted above. The method employed is macro-econometric, comprising a regression analysis of aggregate time-series estimates of the corporate sector's income and saving as

²Corporate income tax considerations need, however, to be taken into account explicitly where the tax policy seeks deliberately to influence the disposal of profits. For instance, it has been shown that differential taxation of dividends and retained earnings, such as was in force in the U.K. between 1947 and 1958, can significantly alter profit appropriation: cf. Feldstein [10]; Feldstein and Flemming [11]; see also Rubner [34] for a different view.

³Company characteristics such as size and capital structure have also at times been found to be significantly related to appropriation of profit. These factors have been omitted from this paper; a test of their significance requires an analysis based on cross-section data whereas the analysis in this paper is based on aggregate time-series data. The interested reader may refer to Modigliani and Miller [30], Florence [13; 14], Hart [17; 19], Dhrymes and Kurz [6], Bates [3] and Meeks and Whittington [28].

⁴Excluding companies based in former East Pakistan.

compiled in a recent study.⁵ Some adjustments to the aggregate estimates were, however, necessary in order to arrive at a suitable statistical base for testing the relevant hypotheses. First, the regression analysis was confined to quoted non-financial companies as the data were available in requisite detail only for this group.⁶ Second, to avoid possible distortion of estimates on account of the starting-up problems – or teething troubles – of new companies, only those companies were included which were in existence at the start of the period considered and had reached the stage of commercial production. A related consideration behind this adjustment was that since for some time at least the age of a company could have a significant influence on its financing pattern, inclusion of newly floated companies in our data might have blurred the underlying behavioural relationships of a more basic character. Third, also excluded were a few companies for which data were not available without breaks or which were much too large in relation to the rest; included among the latter were some large concerns under predominantly government or foreign control.

The period covered by the regression analysis was 1961–75. The relevant data were available in a systematic form only for this period at the time the estimates used in the paper were compiled. This gave a maximum of fifteen (annual) observations. The figure no doubt appears rather small, especially considering that an appropriately defined corporate savings function may contain several variables. Furthermore, the problems posed by a relatively small number of observations may increase if the relevant set of explanatory variables is subject to significant multicollinearity. However, it will be seen in the following section that despite the limitation of a relatively short time series, several variables tried in the regression analysis turned out to be significant and in line with *a priori* predictions. We should nevertheless add that the results may be treated as preliminary, subject to verification and improvement when the relevant data become available for a longer period.

IV. EMPIRICAL RESULTS AND DISCUSSION

Regression results for some basic models of the corporate savings (or retention) function are given in Table 1.⁷ The lagged profits model shows no improvement

⁵See Qureshi [33]. The major source of data for this study was the State Bank of Pakistan's regular publication 'Balance-Sheet Analysis of Joint Stock Companies Listed on Karachi Stock Exchange', which presents standardised balance-sheet and profit-and-loss-account information on individual non-financial companies listed on the stock exchange.

⁶The nature and quality of these data are examined at length in Qureshi [33].

⁷A general note on the regression results presented in the paper: All the results are based on annual observations for the relevant variables. Figures in parentheses under the regression coefficients represent *t*-ratios and, unless stated otherwise, the statistical significance tests are at the 5-percent level. R^2 , \bar{R}^2 and DW stand for the coefficient of determination, the coefficient of determination adjusted for degrees of freedom, and the Durbin-Watson statistic respectively. Variables defined in absolute terms are measured in millions of rupees and the variables defined as ratios/rates are in percentages.

over the simple linear relationship between retained earnings and profits; although the coefficient of the lagged profit term has the right sign, it is insignificant and the problem of serial correlation in the simple bivariate relationship persists. The poor results yielded by the model seemed to be partly attributable to the presence of fairly high collinearity between the current and lagged profit variables. The lagged dividends model, on the other hand, does bring about a substantial improvement in the results. There is a sizable increase in \bar{R}^2 and the problem of serial correlation is also eliminated. The result shows that dividend levels achieved in recent past exercised a significant influence on decisions with respect to appropriation of current profit. It lends support to the Lintner-Dobrovolsky type models; the reasoning underlying these models appears to apply also to appropriation of profits by companies in a developing country such as Pakistan, and in this respect they seem to behave in much the same way as companies in advanced countries for which these models have generally provided good fits.

Table 1

*Regression Results for Some Basic Models of the
Corporate Savings Function, 1961-75*

$R = -5.083 + 0.462P$ (-0.400) (2.968)	$\bar{R}^2 = 0.358$ $DW = 0.536$	(1a)
$R = -5.214 + 0.529P - 0.078P_{-1}$ (-0.306) (2.858) (-0.418)	$\bar{R}^2 = 0.335$ $DW = 0.493$	(1b)
$R = 0.211 + 0.738P - 0.612D_{-1}$ (0.021) (5.425) (-3.574)	$\bar{R}^2 = 0.687$ $DW = 1.734$	(1c)

Note: R = Net retained earnings (i.e. net saving).

P = Post-tax net profits.

D = Total dividend disbursement.

All the variables are valued at current prices, i.e., undeflated for price changes. This is in keeping with the practice followed in virtually all the studies of firms' dividend and savings functions, which is unlike the common practice of working with data deflated for price changes in estimating household consumption and savings functions. The practice of using undeflated data in the former case does not, of course, imply that business firms are in general unconcerned about price fluctuations in matters of dividend distribution and retention; rather it is based on the consideration that their reactions to price changes are relatively complex and on the finding that no simple deflating factor shows any clearly defined effect on the appropriation of profit: cf. Lintner [25, pp. 249-50 and 254] and Dobrovolsky [9, pp. 256-257].

The estimated coefficients of equation (1c) may be interpreted in terms of the Lintner model as follows: The difference between unity and the absolute value of the coefficient of lagged dividends provides an estimate of the 'speed-of-adjustment' coefficient. It shows that, on average, companies tended to adjust dividends during any single period by less than 40 percent of the desired change in dividends from the level of the preceding period. The coefficients of the profit and lagged dividend terms together provide an estimate of the 'target' pay-out ratio, which works out to 67.5 percent of post-tax net profit (or, what amounts to the same thing, the desired retention ratio works out to 32.5 percent of post-tax net profit).⁸

Interpreting the coefficients of equation (1c) in terms of short- and long-run responses, the short-run marginal propensity to save (given by the coefficient of current profit) is indicated to have been little under 75 percent of post-tax net profit. This gives a short-run marginal propensity to distribute of little over 25 percent of post-tax net profit. In Lintner's terminology, the latter is the speed-of-adjustment coefficient times the target pay-out ratio. The long-run propensities to save and distribute work out to 32.5 percent and 67.5 percent respectively of post-tax net profit, which are the same as the target retention and pay-out ratios in Lintner's terminology.⁹

Although the Lintner-type model has generally yielded good empirical results, one important weakness of the model is that it is too aggregative. The model makes current dividend disbursement depend on parameters such as the target pay-out ratio and the speed-of-adjustment coefficient, but provides little information as to the factors which determine them. Furthermore, the model makes no allowance for changes in these parameters over time. In other words, the model restricts itself to a demonstration of how the present level of dividends emerged from the dividend level of the preceding period, using the latter as a bench-mark for each period. The lagged dividend variable thus stands for a composite of factors left unspecified by the model which would, if they could be determined explicitly, explain why dividends were at a particular level in any previous period. If these factors were incorporated directly into the estimating equation in place of the 'bench-mark variable', the resulting model would provide a much fuller explanation of firms' appropriation policy than does the Lintner-type formulation of it. The latter may then be considered as a 'reduced form' of a dividend or retention function that sets out explicitly the

⁸The dividend function corresponding to the retention function $R = a + b_1P - b_2D_{-1}$ can be derived by deducting each side from P . This gives $D = -a + (1-b_1)P + b_2D_{-1}$. The target pay-out ratio then is $(1-b_1) / (1-b_2)$, where $(1-b_2)$ is the speed-of-adjustment coefficient.

⁹In the symbols of the previous note, the long-run increase in dividends as a result of a sustained unit change in profit is given by $(1-b_1) / (1-b_2 + b_2^2 + b_2^3 + \dots) = (1-b_1) / (1-b_2)$, which is the same as the expression for the target pay-out ratio.

relevant arguments in the function. Thus, whereas the Lintner-type estimating equation may give a good fit to time-series data over short- to medium-term periods and highlight the role of adjustment lags in dividend policy, and thereby also provide a useful basis for short- to medium-term forecasting, it does not go sufficiently far in elucidating the factors that influence firms' appropriation policy. For that, the appropriate method is to try out explicitly the factors that are indicated by *a priori* reasoning to be capable of exercising a significant influence on this aspect of firms' behaviour.

One such factor is firms' demand for investment funds. A major difficulty in empirically testing the role of this factor is finding a suitable quantitative measure for it. Ideally, one should use an estimate of planned (*ex ante*) investment expenditure, but data on firms' investment intentions are rarely available. In most studies, therefore, actual (*ex post*) investment expenditure has been used as an approximation for current investment plans. However, since the realisation of investment plans is normally spread over more than one planning period, the investment measure used in some studies has taken the form of an average of actual investment outlays over two to three successive planning periods. For our estimates, companies' demand for long-term investment funds was approximated by using the rate of gross investment in fixed assets in the current year and a similar rate averaged over a two-year period including the current year and the next. A more inclusive definition of corporate asset growth was also tried whereby the current and two-year average growth rates were estimated for total net assets. The latter may be looked upon as a more comprehensive measure of corporate 'expansion requirements' (à la Dobrovolsky) than the former.

Table 2 gives the results of the inclusion of these measures of asset growth in the corporate retention function in addition to profit. All four measures have the right signs, are statistically significant¹⁰ and bring about a substantial improvement in \bar{R}^2 . The estimate of the equation including the current rate of gross investment in fixed assets (I), however, is affected by serial correlation. The Durbin-Watson statistic is in the inconclusive range with the two-year average rate of gross investment in fixed assets (I^*) and with the current rate of growth of total net assets (g). It is only in the case of the two-year average rate of growth of net assets (g^*) that the value of the statistic confirms the null hypothesis of no serial correlation. In all cases, however, the statistic shows an appreciable improvement over that for the simple bivariate model. As we shall see below, the statistic improves further with the addition of some other explanatory variables.

¹⁰To be precise, the coefficient of I falls just fractionally short of significance at the 5-percent level.

Table 2

Regression Results for Models Using Alternative Measures of Investment Demand/Expansion Requirements, 1961-75

$R = -37.433$ (-2.046)	+	$0.661P$ (3.982)	+	$1.741I$ (2.101)	$\bar{R}^2 = 0.518$	(2a)
					$DW = 0.788$	
$R = -59.489$ (-3.269)	+	$0.765P$ (5.011)	+	$3.326I^*$ (3.416)	$\bar{R}^2 = 0.670$	(2b)
					$DW = 1.252$	
$R = -26.058$ (-2.300)	+	$0.567P$ (4.590)	+	$1.703g$ (3.406)	$\bar{R}^2 = 0.671$	(2c)
					$DW = 1.121$	
$R = -39.015$ (-3.594)	+	$0.662P$ (5.813)	+	$2.513g^*$ (4.706)	$\bar{R}^2 = 0.777$	(2d)
					$DW = 1.780$	

Note: I = Gross investment in fixed assets (i.e., buildings, plant and equipment) expressed as a percentage of total fixed assets at the beginning of the year.

I^* = Average rate of gross investment in fixed assets over a two-year period comprising years t and $t + 1$, with equal weights to both years.

g = Growth in total net assets (i.e., net fixed assets plus net current assets, the latter including items such as inventories and financial assets) expressed as a percentage of total net assets at the beginning of the year.

g^* = Average rate of growth of total net assets over a two-year period (derivation similar to that of I^*).

Some absolute measures of investment expenditure and asset growth were also tried, but they almost invariably yielded unsatisfactory results. Apart from contributing to a lessening of collinearity between the regressors, it appears that – from the standpoint of the relevant decision-making process – relative measures of the kind used here provide a better approximation of changes in the strength of investment demand (or, more generally, expansion requirements) than do their absolute counterparts.

Two additional points with respect to these results appear to be worth noting. First, measures defined as two-year averages provide better fits to the data than do the corresponding current year measures. In view of lags in the realisation of investment plans, this was anticipated. However, when the above models were elaborated further by including some additional variables, the current year expansion rates in many cases yielded almost as good results as did the corresponding two-year average rates.

Second, growth of total net assets has greater explanatory power than growth of fixed assets only. The reason for this appears to lie in the fact that the former includes, in addition to increase in fixed assets, increase in assets such as inventories and financial investments. Whereas the sole motivation behind accumulation of fixed

assets is capacity expansion, accumulation of the latter types of assets is also motivated by some other considerations – such as maintaining an adequate stock of working capital and strengthening the company's reserve position – that accompany the process of physical expansion. We shall see below that, like fixed investment requirements, these considerations were also significantly related to retention policy. Thus, it appears that the relatively greater explanatory power of the variable representing growth of net assets in the estimates is due to the reason that this variable subsumes the influence on retention policy of firms' demand for funds not only for investment in fixed assets but also for the other purposes just noted.

Another way of testing the influence of the growth objective on retention policy would be to use some measure of the available rate of return on investment, the hypothesis being that higher expected profitability will induce higher demand for investment funds and, in turn, larger retained earnings. Here again, however, one runs into measurement problems similar to those associated with the use of investment outlays or asset growth. Expectations, of course, are not observable, and the measure of profitability has to be based, one way or another, on realised profitability.

We regressed the retention ratio on some measures of current profitability. Profits were measured variously as gross and net of depreciation and taxes, and were expressed as proportions of net worth (equity assets) and net assets (equity assets plus long-term liabilities). In all cases, even these very simple proxies for expected profitability were found to be positively and strongly correlated with the retention rate, though the exact strength of the correlation varied with the measure used. Some of the regression results are shown in Table 3. Higher profitability seems to have promoted retention of profits at the expense of dividend distribution by stimulating growth, and hence firms' demand for funds for investment. This inference is supported by direct regression of corporate growth on the same measures of profitability; results given in Table 4 show that the two were positively and significantly correlated.¹¹

As noted in Section II, in addition to capacity expansion requirements, companies' working capital and reserve needs also make demands on profits in competition with dividend distribution. Recent changes in company sales have been used in some studies as a proxy for anticipated working capital needs. A sales change variable defined as the change in company sales since the previous period (both in absolute and proportional terms) was tried, but it did not yield significant results for our set of data. However, measures such as companies' net surplus and net current assets did turn out to be significantly related to retained earnings. Changes in these magnitudes indicate changes in companies' reserve and current financial positions, and hence reflect changes in the extent of their demand for funds for meeting their reserve, working capital and liquidity needs.

¹¹Considering that the profit rates have a fair element of 'noise' in them, the results are particularly encouraging.

Table 3
Regressions of Corporate Net Saving Ratio (Retention Ratio)
on Profitability, 1961–75

$$R^* = -29.246 + 6.439p_{na} \quad R^2 = 0.779 \quad (3a)$$

$$(-2.748) \quad (6.498) \quad DW = 2.220$$

$$R^* = -32.049 + 5.608p_{nw} \quad R^2 = 0.726 \quad (3b)$$

$$(-2.525) \quad (5.646) \quad DW = 2.009$$

$$R^* = -64.079 + 6.387p_{gna} \quad R^2 = 0.777 \quad (3c)$$

$$(-4.019) \quad (6.462) \quad DW = 1.981$$

$$R^* = -65.658 + 5.406p_{gnw} \quad R^2 = 0.662 \quad (3d)$$

$$(-3.051) \quad (4.847) \quad DW = 1.515$$

Note: R^* = Retained earnings expressed as a percentage of post-tax net profits.
 p_{na} = Profits net of tax and depreciation expressed as a percentage of net assets at the beginning of the year.
 p_{nw} = Profits net of tax and depreciation expressed as a percentage of net worth at the beginning of the year.
 p_{gna} = Profits net of tax but gross of depreciation expressed as a percentage of net assets at the beginning of the year.
 p_{gnw} = Profits net of tax but gross of depreciation expressed as a percentage of net worth at the beginning of the year.

Table 4
Regressions of Corporate Growth on Profitability, 1961–75

$$g = -3.861 + 1.052p_{na} \quad R^2 = 0.343 \quad (4a)$$

$$(-0.855) \quad (2.503) \quad DW = 1.553$$

$$g = -9.927 + 1.067p_{gna} \quad R^2 = 0.358 \quad (4b)$$

$$(-1.491) \quad (2.586) \quad DW = 1.367$$

$$g = -2.855 + 0.797p_{nw} \quad R^2 = 0.242 \quad (4c)$$

$$(-0.549) \quad (1.960) \quad DW = 1.426$$

Table 5 gives the results of the inclusion of these variables in the retention models alongside the profit and expansion requirements (fixed assets) variables. Net corporate surplus comprises reserve funds of various kinds excluding depreciation reserves while companies' net current assets represent the excess of their liquid and other current assets (viz., cash, deposits, securities and stocks) over their current liabilities of various kinds. Both the variables are significantly and negatively related to retained earnings, indicating that changes in companies' reserve and current financial positions exercised a significant influence, alongside other variables, on their decisions regarding retention of profits.

Table 5

Regression Results for Models including a Variable Representing Corporate Reserve/Current Financial Positions, 1961-75

$R = 17.067 + 0.676P - 0.140S_{-1}$ (1.594) (5.947) (-4.332)	$\bar{R}^2 = 0.751$ $DW = 1.179$	(5a)
$R = -21.180 + 0.786P + 2.123I^* - 0.103S_{-1}$ (-1.291) (7.561) (2.856) (-3.556)	$\bar{R}^2 = 0.848$ $DW = 2.124$	(5b)
$R = 26.771 + 0.605P - 0.133C_{-1}$ (2.395) (5.932) (-4.782)	$\bar{R}^2 = 0.781$ $DW = 1.207$	(5c)
$R = -12.303 + 0.729P + 2.017I^* - 0.099C_{-1}$ (-0.737) (7.452) (2.859) (-3.938)	$\bar{R}^2 = 0.865$ $DW = 2.090$	(5d)

Note: S_{-1} = Net corporate surplus at the beginning of year t (i.e. at the end of year $t-1$).
 C_{-1} = Net current assets at the beginning of year t .

It may be noted that the net surplus and net current assets variables became statistically insignificant when they were used with the expansion requirements variable defined in terms of total net assets rather than fixed assets only (results not shown in the table). This is what one would expect, as net assets comprise both fixed and current assets. It was noted earlier that it was precisely because of this difference that the variable representing growth of total net assets had greater explanatory power in the estimated retention functions in Table 2 than did the variable representing growth in fixed assets only.

In line with the general empirical finding, corporate income tax was found to have little effect on the distribution of profits between dividends and retained earnings. Inclusion of the total tax paid and the effective rate of the tax (i.e. total tax paid as a proportion of pre-tax profits) in models using post-tax profits did not make any appreciable contribution to the results, though the coefficients on these variables

had the expected negative sign and there was some improvement in \bar{R}^2 s. When pre-tax profits and the total tax paid were included in the same equation, the positive and negative coefficients (respectively) on the two terms had about the same absolute magnitudes (results not reported here).

In addition, the results supported what was referred to in Section II as the 'tax-shelter' hypothesis. As in many other countries, capital gains have been taxed in Pakistan at much lower rates than ordinary personal income. Furthermore, the extent of the differential has varied overtime. To test the tax-shelter hypothesis, it was necessary to derive a quantitative measure of the incentive to retain profits provided by the tax differential. One such measure is the absolute difference between the marginal tax rates on ordinary income and capital gains, i.e. $t_y - t_g$. An alternative measure can be the ratio $(1-t_g) / (1-t_y)$, measuring the ratio of disposable income per unit of income from capital gains to disposable income per unit of ordinary personal income. Both of these measures were tried in the regressions. In addition, t_y was tested alone in some models. All three measures were expected to be positively related to retained profits.

As income tax rates rise with income levels under progressive taxation, another measurement problem was choosing a level, or levels, of income to which the relevant marginal tax rates should relate. In view of the highly skewed distribution of corporate stock ownership in the country and the generally close identity that existed over the period examined between major stockholders and management, tax rates on top income brackets were chosen for use in the regressions. Since choosing any one level of income would have an element of arbitrariness, marginal tax rates relating to three different income levels at the top end of the income-tax scale were separately tested to minimise the risk of the statistical outcome being determined largely by arbitrary selection of a single income level.¹²

All the aforesaid measures of the tax-shelter variable turned out to be significant in virtually all the estimated models, carrying the predicted positive coefficients. Some representative regression results are given in Table 6; these results indicate that considerations about the personal tax liabilities of shareholders, especially major share-holders, have been a significant influence on corporate appropriation policy in the country.

¹²Statutory marginal tax rates at annual taxable income levels of Rs. 40,000, Rs. 60,000 and Rs. 70,000 were used in the derivation of the tax-shelter measures. It may be noted that there are no statutory marginal tax rates as such in Pakistan on personal income from capital gains. Income from capital gains arising out of sale of stocks and shares is taxed at the respective marginal rates on ordinary income, but after an initial percentage exemption that has been changed from time to time. Marginal tax rates on personal capital gains, t_g , used here are those that are implicit in this taxation scheme.

Table 6

Regression Results for Models Including a Tax-Shelter Variable, 1961-75

R	=	-144.707 (-2.838)	+	0.568P (4.383)	+	1.865 t_y (2.796)		\bar{R}^2	=	0.579	(6a)		
								DW	=	1.356			
R	=	-58.642 (-2.718)	+	0.671P (4.600)	+	0.735 t_{y-g} (2.820)		\bar{R}^2	=	0.582	(6b)		
								DW	=	0.992			
R	=	-144.410 (-3.000)	+	0.706P (5.004)	+	1.369I (1.912)	+	1.540 t_y (2.346)		\bar{R}^2	=	0.710	(6c)
								DW	=	1.261			
R	=	-92.086 (-4.706)	+	0.841P (6.768)	+	1.837I (3.221)	+	0.805 t_{y-g} (3.645)		\bar{R}^2	=	0.772	(6d)
								DW	=	1.244			
R	=	-169.375 (-3.872)	+	0.719P (5.910)	+	2.446I* (2.924)	+	1.735 t_y (2.659)		\bar{R}^2	=	0.795	(6e)
								DW	=	2.062			
R	=	-98.059 (-6.087)	+	0.862P (8.173)	+	3.001I* (4.565)	+	0.681 t_{y-g} (3.654)		\bar{R}^2	=	0.852	(6f)
								DW	=	2.562			
R	=	-56.329 (-3.154)	+	0.663P (5.594)	+	1.352g (2.861)	+	0.512 t_{y-g} (2.044)		\bar{R}^2	=	0.745	(6g)
								DW	=	1.273			
R	=	-59.433 (-3.828)	+	0.708P (6.576)	+	2.092g* (3.824)	+	0.397 t_{y-g} (1.712)		\bar{R}^2	=	0.813	(6h)
								DW	=	1.978			

Note: t_y = marginal tax rate on ordinary income.

t_{y-g} = Difference between marginal tax rates on ordinary income and capital gains.

In the regression results shown in this table and elsewhere in this paper, both t_y and t_{y-g} are measured at taxable income level of Pak. Rs. 60,000 per annum.

The same variables measured at taxable income levels of Rs. 40,000 and Rs. 70,000 per annum yielded roughly similar results (see text).

The choice of income level for measuring the tax variable made little difference to the results; the variable was statistically significant no matter which of the three selected income levels was used as the basis for measuring it, and yielded roughly similar \bar{R}^2 s. Since the marginal tax rate series at these income levels were quite closely correlated, this was not unexpected.

Another point to note is that the tax rate on ordinary personal income alone was able to produce highly significant results. The more complex measures based on the differential between this rate and the tax rate on capital gains generally yielded higher \bar{R}^2 s than did the former alone, but the difference was not large. To determine the relative significance of the capital gains factor in the tax-shelter effect, the capital gains tax was also tried alone in some regressions. The results (not shown here) were much weaker than those for the ordinary income tax and tax differential

variables; \bar{R}^2 s were appreciably lower and the capital gains variable, though consistently carrying the predicted negative coefficient, was only weakly significant (at the 10-percent level). These results show that the level of the tax rate on ordinary personal income is the major factor in determining the strength of the incentive to forgo current dividend income for the sake of tax saving.¹³

The relatively weak influence of the capital gains tax is also reflected in the lower size of the coefficient of the tax variable when it is defined as the difference between the rates of tax on ordinary income and capital gains rather than as representing only the level of the former. An increase of one percentage point in the difference between the two taxes is indicated to have greater influence on retained earnings when this increase results solely from an increase in the rate of the ordinary income tax rather than from a combination of changes in both the tax.¹⁴

The relatively weak effect of the capital gains tax on retention policy appears to reflect the real picture with respect to the operation of this tax. Current decisions regarding higher retention for the purpose of tax avoidance may be taken without much concern for the tax liability associated with ultimate realisation of the capital gains that may accrue as a result. To begin with, the capital gains tax can be deferred for as long as realisation is avoided. Evidence shows that only a small proportion of capital gains is realised in practice.¹⁵ The tax is escaped completely on transfer of stock to one's heirs. In Pakistan, this also holds good for transfer by gift. A related consideration is the relative ease with which capital gains generally go unreported.¹⁶

Finally, we consider the results of regressions run to test the influence on retention policy of changes in the cost and availability of external finance to businesses. The cost side of external finance was tested by including in the regressions some measures of the interest cost of medium to long-term borrowed funds. Three different available measures of interest cost were tried, namely, the annual yield on long-term government bonds, a weighted average rate of interest on commercial bank advances secured by machinery and other fixed business assets, and a similar rate on all types of commercial bank advances.¹⁷ All three measures, however, yielded closely similar results, reflecting their more or less parallel time paths. For this reason, regression results for models including an interest rate variable shown in Table 7 relate only to one interest rate series, namely, the weighted average rate of interest on commercial bank advances secured by fixed industrial assets.

¹³A similar finding is reported by Brittain [4; pp. 88-9].

¹⁴This was also reflected in the results of models including only the capital gains tax.

¹⁵Based on U.S. data, a study by Bailey [2] found that generally about 80 percent of capital gains remain unrealised.

¹⁶Even in a developed country such as the U.S., it has been reported that as much as one-third or more of the individual taxpayer capital gains go unreported: cf. Hinrichs [20].

¹⁷In all three cases, the annual figures used were averages of the respective quarterly figures.

Table 7
Regression Results for Models including an Interest Rate/External Finance Inflow Variable, 1961-75

R	$=$	-29.726 (-2.817)	$+$	$0.646P$ (5.331)	$+$	$1.238g$ (2.354)	$+$	$0.843r_f$ (1.785)	\bar{R}^2	$=$	0.726	(7a)
									DW	$=$	0.898	
R	$=$	-38.391 (-3.739)	$+$	$0.688P$ (6.311)	$+$	$2.002g^*$ (3.277)	$+$	$0.665r_f$ (1.483)	\bar{R}^2	$=$	0.801	(7b)
									DW	$=$	1.732	
R	$=$	-51.626 (-2.892)	$+$	$0.762P$ (5.316)	$+$	$2.355I^*$ (2.114)	$+$	$0.834r_f$ (1.528)	\bar{R}^2	$=$	0.708	(7c)
									DW	$=$	1.155	
R	$=$	-82.555 (-3.985)	$+$	$0.844P$ (6.935)	$+$	$1.529I$ (2.490)	$+$	$0.655t_{y-g} + 0.542r_f$ (2.631) (1.204)	\bar{R}^2	$=$	0.782	(7d)
									DW	$=$	1.155	
R	$=$	-21.897 (-2.364)	$+$	$0.467P$ (4.393)	$+$	$2.559g$ (4.948)	$-$	$0.209EF$ (-2.638)	\bar{R}^2	$=$	0.787	(7e)
									DW	$=$	2.234	
R	$=$	-51.874 (-3.067)	$+$	$0.659P$ (4.647)	$+$	$3.670I$ (3.295)	$-$	$0.280EF$ (-2.245)	\bar{R}^2	$=$	0.648	(7f)
									DW	$=$	1.651	
R	$=$	-95.082 (-5.852)	$+$	$0.816P$ (7.884)	$+$	$3.218I$ (4.285)	$+$	$0.695t_{y-g} - 0.202EF$ (3.687) (-2.365)	\bar{R}^2	$=$	0.844	(7g)
									DW	$=$	2.213	

Note: r_f = Weighted average rate of interest on commercial bank advances secured by machinery and other fixed business assets, corrected for the rate of change in the wholesale price index.

EF = Net long-term borrowing estimated as the difference between total long-term liabilities [to be discharged after a period of more than a year] outstanding at the beginning and end of year t (it should be noted that this measure is somewhat biased by the transfer of maturing long-term liabilities to the short-term category).

Another point to be noted about the interest rate variable in these results is that this variable has been defined in real terms, the real interest rate on borrowed funds having been derived by deflating the nominal rate by the rate of increase in the national wholesale price index.¹⁸ Nominal interest rates were also tried, but they all gave unsatisfactory results; the coefficients of these rates were consistently negative, contrary to what one would normally expect. Real interest rates, on the other hand, yielded much better results, with consistently positive coefficients. This difference could be due to both statistical and behavioural factors: nominal interest rates are subject to a higher degree of collinearity with other nominally defined variables than are real interest rates; on the behavioural side, borrowing decisions may turn chiefly on the real rather than nominal cost of funds.

On the whole, however, the results shown in Table 7 point to a relatively weak correlation between changes in the real cost of borrowed capital and the behaviour of retained earnings; the value of the coefficient of the interest rate term is in most cases just around 1.5 times the standard error. But the weak correlation does not come as a surprise. Interest rates in the country generally remained much below the level of industrial profitability, and such changes as took place in the rates did not normally make much more than a minor difference to the relative levels of the two. With interest rates at low levels, the scale of firms' reliance on borrowed capital appears to have been conditioned more by the *availability* of funds than by their *cost*. This was particularly true in the case of foreign currency loans; these loans were available from specialised financial institutions – to enterprises which had been successful in securing appropriate government clearances – not only at low interest rates but also at an exchange rate which remained appreciably overvalued until the devaluation of 1972. Under these conditions, it could be argued that even the relatively weak correlation between interest rate changes and retention behaviour shown by the regression results might be either largely fortuitous or a reflection chiefly of the influence of changing conditions with respect to the availability of external funds (partly captured by interest rate changes) rather than their cost.

Of course, if interest rates were flexible, changes in the availability of loanable funds would be duly reflected in changes in the rates. We would then not have to speak separately of the effects of the cost and availability of funds, for one would also imply the other – high interest rates implying tight money and capital market conditions and *vice versa*. The policy pursued in Pakistan over the period examined, however, was one of relatively rigid interest rates fixed by a combination of directives from the central bank and mutual agreements between leading commercial banks. The rates were in general kept much below the levels that would clear the financial markets by equating supply and demand. Under such a scheme of slowly

¹⁸Using $(P_w - P_{w-1}) / P_{w-1}$, where P_w is national wholesale price index, as an approximation for the expected rate of inflation.

changing and artificially depressed interest rates, the availability of funds relative to the demand for them could change quite substantially, with only a part of it being reflected in changes in the rates.

If the weak correlation between interest rates and retained earnings in the above results could be attributed largely to the fact that changes in interest rates reflected only partially changes in the availability position with respect to external finance, then one would expect to find a stronger correlation between the external finance situation and retention policy if the availability factor could be captured more accurately by an alternative regressor. We tried net long-term borrowing by the companies as one such regressor. Since the use of external finance remained an attractive proposition from the cost side throughout the period, with interest rates generally at levels at which demand substantially exceeded supply, changes in the actual scale of long-term borrowing may be taken as a reasonable reflection of changes in the availability position with respect to long-term external finance. The regression results supported the view that external finance conditions appear to have influenced firms' decision making more from the availability than cost side. The new external finance variable was found to be much more strongly correlated with retained earnings than the interest rate variable; in the estimates reported in Table 7, the coefficient of the new variable bears the predicted negative sign and is statistically significant. The results show that given the level of profits and expansion requirements, the availability of larger volumes of external funds induced a greater reliance on such funds and a reduction in internal financing.

V. SUMMARY AND CONCLUSIONS

Companies' behaviour with respect to retention and distribution of profits has received little attention in the past in developing countries. Using time-series data relating to the non-financial corporate sector in Pakistan, the paper tested some hypotheses regarding this aspect of companies' behaviour which have been developed mainly in the contest of advanced industrial countries. The evidence suggests that many of these hypotheses are applicable to developing countries where the corporate sector is generally relatively small and less developed and the financial markets are subject to greater imperfections.

Regression analysis of retained earnings supported the hypothesis that firms favour a relatively stable dividend policy. The results also showed profits as being the primary determinant of retained earnings. Not only did the amount retained depend on the volume of profits, but the proportion retained was also related strongly to the rate of profit. Higher profitability induced larger ploughing back by stimulating investment and thereby raising firms' demand for long-term funds. Other proxies for firms' investment demand such as fixed-investment outlays and rates of expansion were also tried and were found to be significantly related to retention behaviour. In

addition, firms' demand for funds to meet their working capital and reserve needs — which tend to increase with capacity expansion — was also found to make significant claims on profits in competition with dividend distribution.

Corporate income taxation reduced both retained earnings and dividends by reducing disposable profits but had little effect on the proportion retained or distributed. However, this proportion was found to be influenced significantly by differentials in the tax treatment of ordinary personal income and capital gains. A relative increase in tax rates on ordinary personal income at the top end of the income scale (where a disproportionately large chunk of the total corporate stock was concentrated) induced larger retained earnings as this meant greater savings in the personal tax liabilities of the stockholders, through retention of profits.

Changes in the cost of external finance did not have any major effect on the appropriation of profits. This is what one would have expected in view of the policy pursued in the country of keeping interest rates within a relatively low range. Conditions with respect to availability (as distinguished from cost) of borrowed capital did, on the other hand, exercise a significant influence on profit appropriation. The large spread between industrial profitability and interest cost made borrowing a highly profitable proposition for firms and rendered their financing decisions, given their overall requirements for funds, quite sensitive to the amount of external funds they could obtain under the existing regime of non-price rationing of those funds.

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