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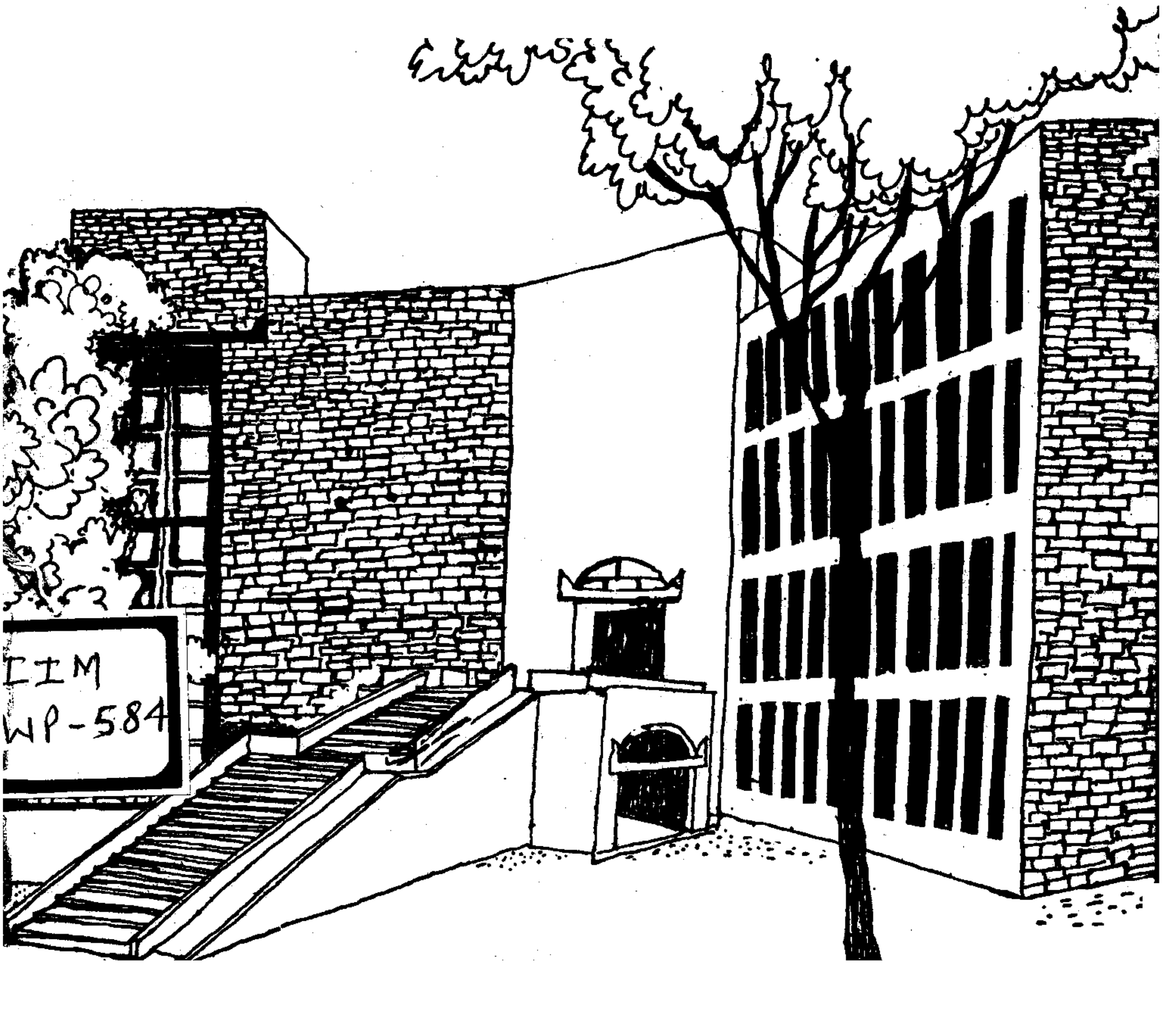

THE INFLUENCE OF INDUSTRY STRUCTURE ON FIRM PERFORMANCE AND CONDUCT IN A MANAGERIAL THEORY OF THE FIRM

By

K.C. John

&

A. Das-Gupta

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INDIAN INSTITUTE OF MANAGEMENT
AHMEDABAD-380015
INDIA

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1. INTRODUCTION

The purpose of this paper is to formulate a general model of industrial organisations along the lines of the managerial theories of the firm to generate a testable set of hypotheses as to industry performance and structure. The model places special emphasis on the role of bargaining power of two dominant stakeholders of contemporary firms -- management and shareholders. The Svejnar-Kalai variable-bargaining-power model is adopted to introduce explicitly the bargaining power of the stakeholders. The paper also studies the comparitive static implications of the model and thereby formulates a set of testable hypotheses as to industry structure and performance.[1]

2. A brief Review of the Literature

The seminal analysis of Bearle and Means (1967) on the separation of ownership and control led them to propound four propositions:

(i) Economic power, in terms of control over physical assets, is tending more and more to concentrate in a few large manufacturing corporations ;

(ii) the assets of large corporations are

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1. John is currently engaged in testing the prediction of the model with Indian data as part of his fellow thesis.

increasingly under the centralised control of small self-perpetuating groups of professional managers with small personal ownership of the assets they control;

(iii) the constraints placed upon managerial behaviour by the capital market are increasingly ineffective because of changes in the financial policies of corporations, and

(iv) there is a desirable tendency for managers to develop a corporate conscience which leads them to pursue policies quite alien to the raw ethic of entrepreneurial capitalism.

In response to the observed "separation of ownership and control", several alternative theories of the firm have been provided (Baumol, 1959; Williamson 1963, 1964; Marris 1963, 1964; Galbraith, 1973). These theories draw attention to the plausibility of different objectives pursued by management and shareholders and the possibility of the exercise of managerial discretion in the selection of corporate goals. In particular, Baumol (1959) suggests that large corporations maximise total sales revenue subject to some constraints on the minimum tolerable profitability; Williamson's formulation has as its objective function the managerial utility function with three elements; discretionary profits, expenditure on staff and emoluments.

A significant difference between Baumol and Williamson is that whereas Baumol's managers want to make profit only in so far as this is consistent with increasing sales or in so far as they are forced to do so by shareholders, Williamson's managers show a positive desire for profits, which nevertheless, competes with their desires for income and status as reflected in expenditure on staff and on emoluments.

Marris suggests that firms maximise their rate of growth. Marris' chief contribution is partly in the theory of valuation -- the relationship between the growth of the firm and its market value; partly in the formulation of a managerial utility function with growth as a major element; partly in the theory of demand -- the idea that by incurring expenditure on research and diversification, markets can be created; and ultimately in the formulation of a model in which take over is the ultimate constraint.[2]

The fruitfulness of these 'managerial' theories of the firm continues to be a matter of dispute, primarily because many of their predictions are qualitative and similar to those derived from profit-maximisation models, thus rendering the distinction between them unnecessary for many purposes and making it difficult to devise convincing tests of the alternative theories (Solow, 1971).

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[2] For a comparison and discussion of profit-, growth-, and revenue-maximisation theories of the firm, see Williamson (1966).

A view-point more typical of the contemporary business organisation is expressed in the 'Stakeholders Approach'. This concept suggests the existence of multiple objectives as a firm has to service multiple constituencies with which it has transactional relationships. Cyert and March (1963) view the firm as a coalition of several groups of participants within and outside the organisation. This view implies that management cannot ignore the often conflicting claims of various powerful groups. The proponents of such a multiple constituency model view organisations as "intersections of particular influence loops, each embracing a constituency biased toward assessment of the organisation's activities in terms of its own exchanges within the loop" (Connolly, Conlon and Deutsch, 1980). They suggest evolving criteria for assessing effectiveness from the preferences of multiple constituencies for the outcomes of organisational performance. However, this approach does not lend itself to hypothesis testing as one is beset with questions like: Whose preferences should be satisfied through the distribution of the outcomes of performance? How are judgements of overall organisational effectiveness reached, given divergent constituent preferences for performance? Whose preferences should be weighted most heavily in reaching a judgement of organisational effectiveness? In this paper we present a model which makes use of the Svejnar-Kalai variable-bargaining-power function with management and shareholders as the two important stakeholders. As the relative strength of the constituents will influence the important organisational decisions and thereby the outcomes, the Svejnar-Kalai model allows us to explicitly incorporate the bargaining power of stakeholders as key determinants of firm behaviour. An analysis of the model gives rise to results which are corroborated in the literature. However, we also obtain some new results on firm behaviour.

In the next section we provide an overview of our approach to the formulation of the model, and comment on its rationals and develop casual structure of the model.

Section 4 contains an analysis of the first order conditions for a bargaining equilibrium from which several results are obtained.

A simplified form of the model is presented in Section 5, while the results of a comparitive static analysis of this model are discussed in Section 6.

Section 7 discusses possible extensions of the current exercise, while, summary and conclusions are presented in Section 8.

3. A Managerial Model of the Firm

3.1 The Approach

The approach adopted in this paper is to reformulate the managerial theories of the firm as problems of utility maximisation in a variable-bargaining-power model. Corporate management and shareholders are the two important constituent groups considered. They need not pursue the same set of objectives. The shareholders, for instance, would prefer the firm to make more profits, declare higher dividends and maximise the market value of the shares of the company, while the management rather than acting solely in a stewardship role has interests of its own to pursue in terms of higher salaries, security, professional excellence and firm size in terms of physical and human resources, thereby, enabling them to enjoy power and discretion which vastly exceeds that imputed to it by classical theory (Gordon, 1961; Williamson, 1964).

We adopt the Svejnar-Kalai variable bargaining-power model that generalizes the comparative bargaining game by introducing explicitly the bargaining power of stakeholders. Utilizing axioms of Pareto optimality, independence of equivalent utility representations and an axiom of proportionality it has been shown that there exists a unique solution to the bargaining problem (Svejnar, 1977, 1980, 1982 ; Kalai 1977; Svejnar and Smith, 1984), and that the stakeholders act as if maximising under complete information the weighted product of their utilities:

$$\max U = U_S^{\alpha} \quad U_M^{(1-\alpha)}$$

where, U_S and U_M are the respective Von Newmann-Morgenstern utility functions of shareholders and management groups, while α and $(1-\alpha)$ are their respective bargaining powers. The bargaining powers are normalised so that they sum to unity. The model is readily generalizable to account for more than two stakeholders. However, in the present exercise only the two important stakeholders -- shareholders and management -- are considered.

3.2 Notations and Definitions

U_S = utility function of shareholders;

U_M = utility function of management;

U = weighted product of utilities of shareholders and management;

α = bargaining power of shareholders;

$(1-\alpha)$ = bargaining power of management:

S = salary of management;

S^* = average industry salary of management;

ϕ = dividend rate;

d^* = industry average dividend rate;

N = no. of firms in the industry;

$E(N)$ = expected number of potential entrants;

A_B = book value assets of the firm;

A_M = market value of assets of the firm;

π = profits earned;

R = revenue function;

C = cost function;

ε = (constant) elasticity of demand ;

β = demand shift parameters;

Q = production level ;

r = cost of capital, and

w = labour wage rate.

3.3 The General Model

1. $U = U_S^{\alpha} \, U_M^{(1-\alpha)}$; $0 < \alpha < 1$

2. $U_M = U_M\,(S/S^*,\ \Pi,\ d^*,\ N, E(N),\ A_B,\ \Pi)$

   $U_{M1}>0$; $U_{M2}<0$; $U_{M3}<0$; $U_{M4}<0$; $U_{M5}<0$; $U_{M6}>0$;
   $U_{M7}>0$; $U_{Mii}<0$; $U_{Mij} = 0$ if $i \neq j$.

3. $U_S = U_S\ (\phi\,\pi + A_M,\ d^*)$

   $U_{S1}>0$; $U_{S2}<0$; $U_{Sii}<0$; $U_{Sij} = 0$ if $i \neq j$.

4. $Q = Q\ (A_B\ ,\ L)$

   $Q_1>0$; $Q_2>0$.

5. $C = r\,A_B + w\,L$

6. $\pi = R - C$

7. $R = \beta Q^{1-\varepsilon}$; $\varepsilon>1$ constant

8. $\varepsilon = \varepsilon(N)$; $\varepsilon_1>0$

9. $\beta = \beta(N)$; $\beta_1<0$

10. $E(N) = f\ (\ (\pi/Q),\ d^*)$

    $f_1>0$; $f_2<0$; $f_{ij} = 0$

11. $A_M = A_M\ (\ \pi\ ,\ E(N),\ d^*)$

    $A_{M1}>0$; $A_{M2}<0$; $A_{M3}<0$.

12. $S = S(\pi, S^*)$

$S_1>0$; $S_2>0$.

We have to maximise $U = U_S^{\alpha} U_M^{(1-\alpha)}$ with respect to the choice variables ϕ and $\dot{A}_B$, the dividend rate and firm size respectively.

3.4 Discussion of the Model

3.4.1. The Utility function of the Management: Equation (2) gives the management utility function. There exists substantial consensus among organisation theorists and economists in this field, that the immediate determinants of managerial behaviour are salary, security, status, power, prestige, and professional excellence (Williamson, 1964).

3.4.1.1 Salary : Salary is not a motive in itself but acts as a means of attainment of security, status, power and prestige. Salary also proxies the material reward that the firm is well suited to provide (Williamson, 1964). It is postulated that salary level changes will positively influence managerial utility ($U_{M1}>0$).

3.4.1.2. Security: Job security is an important argument appearing in the managerial utility function (Galbraith, 1973), given the fact that there is no organised market for managers, and managerial mobility between corporations is very low (Marris, 1963).

Leibenstein (1976) working on the basic motivation of economic units, has shown that the behaviour of individual economic agents can to a large extent be explained by their desire to be close, in some sense, to certain "targets", or "standards" which are gradually shaped over time.

Koutsoyiannis (1981) argues that managers would prefer to adhere to the established code of behaviour in the industry in which the firm operates, because deviations are more likely to increase the risk of collective loss of management employment. Consequently, a firm cannot indefinitely adopt a lower dividend payment than similar firms in the industry without increasing the risk of an ultimate fall in the price of its shares, thereby setting up conditions favouring a takeover bid due to growing dissatisfaction among shareholders. The likelihood of replacement of the managerial team in such eventualities is increased. Adherence to the industry code of behaviour, therefore, safeguards the job security of managers.

Taking into account the above considerations, it seems plausible to argue that managers feel most secure in their employment if they keep their dividend payout close to the dividend policies of similar rival firms. Thus managers in any one period attempt to adjust the firms actual dividend payout to the industry average. The dividend ($\phi\pi$) of the firm and the industry average dividend rate (d^*) will represent the 'job-security hypothesis' in the model. Since managers have a definite preference for retained earnings, we postulate a negative relationship between change in magnitude of dividend policy of the firm with managerial utility, that is, $U_{M2}<0$. Similarly, an increase in industry average dividend rate, ceteris paribus, puts pressure on management to make its dividend policy closer to the industry average and hence we assert $U_{M3}<0$.

3.4.1.3 Professional Excellence : Managerial job security is reinforced by growth (Galbraith, 1973), which also allows managers to attain other goals such as high salaries power and status, perquisites and the resolution of personnel conflict, which is inevitable in large corporations. Thus managers become growth seekers, searching continuously for profitable investment opportunities, which adds to their ratings of professional excellence. The variables profit (π) and the firm size (A_B) will capture the rating of a managerial team among the professional managers.

Increased profit levels have positive utility to manager. for the following reasons:

(i) they make expansion of staff and perquisites possible;

(ii) for a given dividend rate, retained earnings available for profitable investment increases, and

(iii) managers derive satisfaction from self-fulfilment and organisational achievement -- and profit is a measure of this success.

Hence, we postulate $U_{M7}>0$.

Increased asset levels also have positive utility for managers as it satisfies among other things the growth-seeking behaviour of managers. Therefore, we can conclude that $U_{M6}>0$.

3.4.1.4 Competitive Structure and Entry Conditions:

The conditions of competition in the product market play a critical role in determining the extent to which managerial discretion can operate. The number of firms in the industry (N) and the expected number of entrants E(N) reflect these conditions.

Increase in either the number of firms or the number of potential entrants will influence managerial utility in a negative way, because both will lead to increased product market competition and hence a reduction in the discretionary opportunities of the management. Hence, we can postulate $U_{M4}<0$ and $U_{M5}<0$.

3.4.2 <u>The Shareholder's Utility Function</u>

Equation 3 gives the shareholders utility function. The neoclassical theory of the firm postulates for a firm the goal of shareholder-welfare maximisation. This criterion, however, is not readily applicable when the firm is owned by many shareholders, each of whom has his own time preference for consumption.

This difficulty has been overcome by assuming a perfect capital market. Then the welfare maximisation criterion can be replaced by market-value criterion . This criterion implies that the maximisation of the present value of the productive resources of the firm, which is technological problem, leads to the maximisation of the present value of the firm's resources by appropriate production-investment decisions is equivalent to the maximisation of the value of the shares of the existing shareholders. This is because in a perfect capital market the present value of the resources of the firm is necessarily equal to the market value of the equity given that there is a unique rate.

The market-value criterion can in principle be implemented, because it requires objective knowledge of the technology of the firm and the current interest rate. As a consequence, optimal investment decisions can be made independently from the preferences of shareholders.

As shown in the figure 1, the given technolgy of the firm defines the production possibility curve PP' . The prevailing market interest rate and the technology defines the optimal investment point k. This investment decision would be reached by any rational decision-maker, whose goal would be the maximisation of the present value

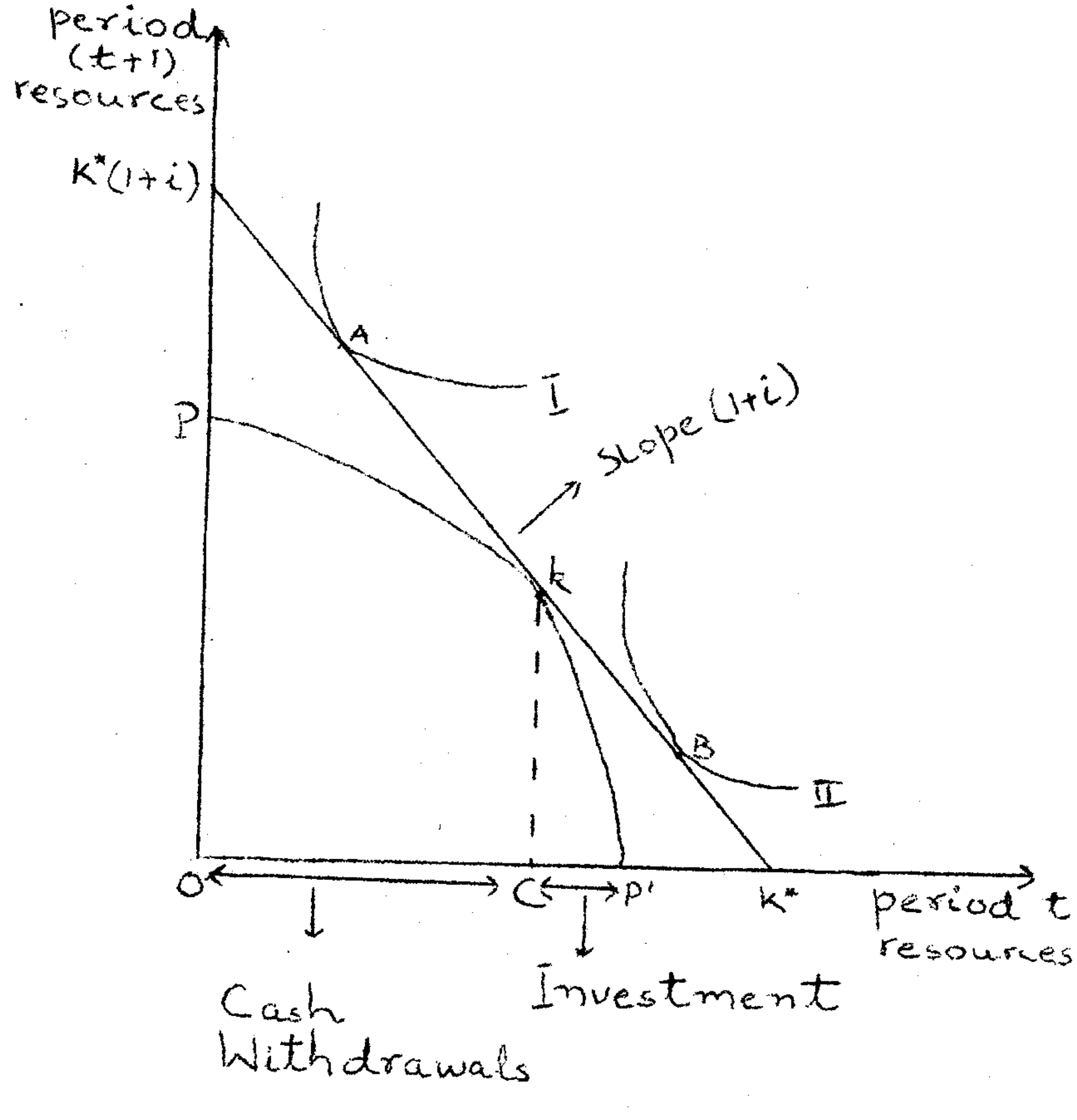


Fig. 1: Market-value criterion

of the resources of the firm. Once, the first tangency point k is reached, the second one can be sought individually by each investors, depending on his own time preferences. Shareholder 1 maximises his utility point A by lending some of his cash withdrawals (dividend) from the firm, while shareholder π maximises his utility at point B, by borrowing funds in addition to his cash withdrawals.

Thus, the market value of productive assets (A_M) enters the shareholder's utility function in addition to current dividends, $\phi\,\pi$.

With increase in ($\phi\,\pi + A_M$), the shareholders' utility will be increased and hence $U_{S1}>0$. While if the industry average dividend rate increases, ceteris paribus, the shareholders' utility will decline, that is, $U_{S2}<0$.

3.4.3 The Production Function

We have specified a general production function of the form $Q(A_B, L)$ with the usual assumption of $Q_1>0$, $Q_2>0$, $Q_{11}<0$, $Q_{22}<0$ and $Q_{12}>0$ in equation (4).

3.4.4 The Cost Function

Equation (5), the cost function of the firm has the form $C = r\,A_B + w\,L$, where, r and w are exogenously given.

3.4.5 The Profit Function

The revenue function in equation (7) assumes a constant elasticity demand curve. However, the more the number of units in the industry, the more elastic will be its demand, while with the increase in the number of firms in the industry, the demand from each unit in the industry will decline. Thus we have the elasticity, ε, positively related to the number of firms and the shift parameter, β, negatively related to the number of firms in equation (8) and (9). The profit function is given by equation (6).

3.4.6 The Potential Entrant Function

This function is in equation (10). The number of potential entrants will be governed by per unit profit and the industry average dividend rate. The higher the per unit profit in the industry the higher will be the number of potential entrants, i.e., $f_1>0$ while the higher the industry average dividend rate, the lower will be the chances that a new entrant can operate viably, hence, $f_2<0$.

3.4.7 The Market Value of the Firm

This function is given by equation (11). The higher the profit level of the firm, the higher will be the market valuation of its productive assets (that is, $A_{M1}'>0$). However, market valuation is likely to decline if the industry is seen as having a high exposure to potential entrants (that is, $A_{M2}<0$ is assumed).

3.4.8 The Salary Function

The determinants of management salary are given by equation

(12). It was argued that increased profits enables the manager's utility due to the possibility f increased salary, staff, perquisites, etc. Hence, it is postulated that $S_1>0$. The average industry salary structure, proxied by S^*, will also be positively related to the firm salary structure and hence $S_2>0$.

3.5 Causal Structure of the Model

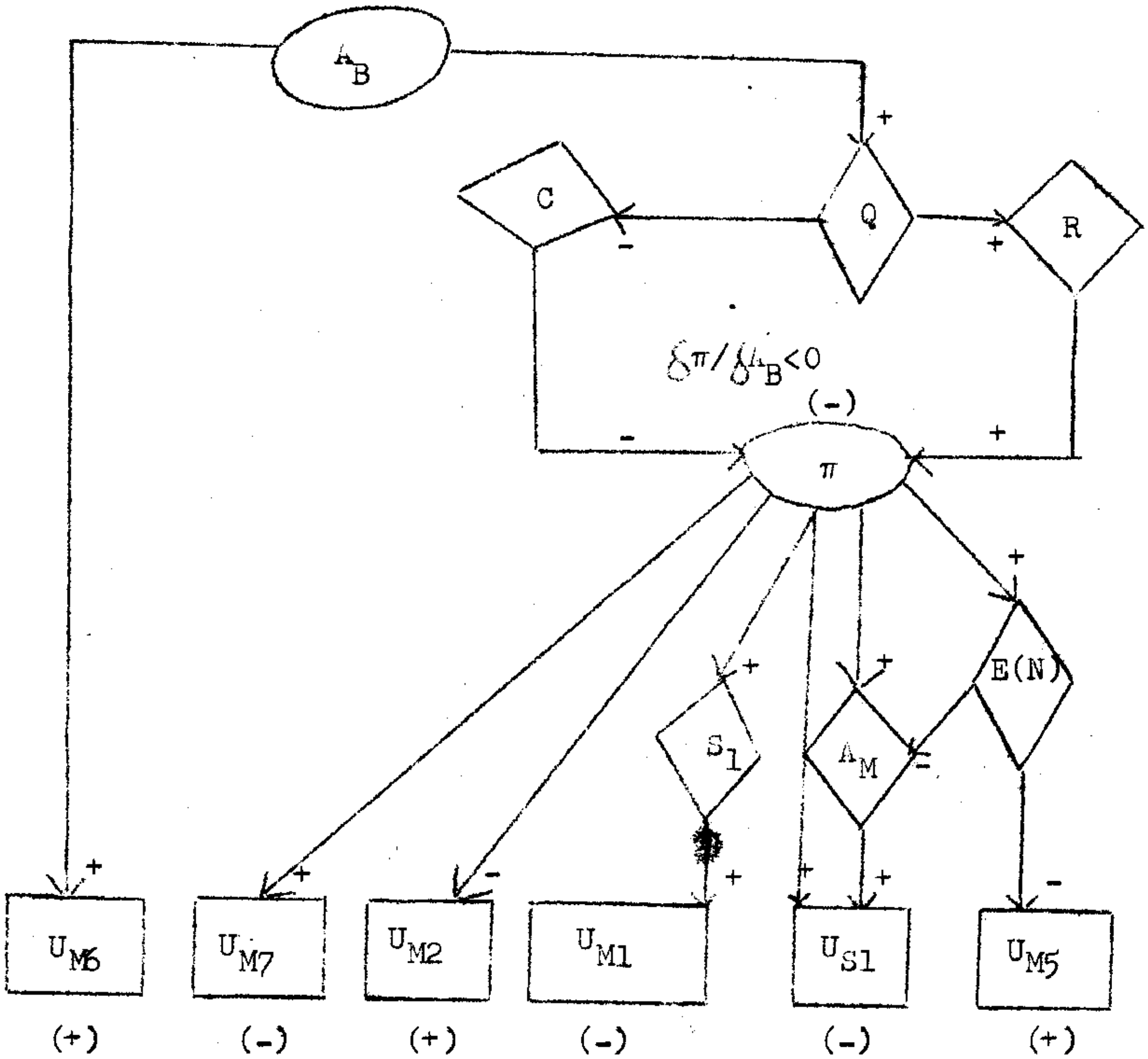
A clear idea of the workings of the model can be obtained by examining its causal structure. The causal chains from the independent variables -- firm size, number of units in the industry, dividend rate, average industry dividend rate and average industry salary level along with their respective direct and indirect impacts on the utility of management and shareholders is provided in Exhibit I. We now discuss these causal chains.

3.5.1 The Firm Size (A_B)

The firm size (A_B) has a positive direct effect on managerial utility, while, its indirect effect is negative as shown in the causal structuring. However, in the presence of high entry threats this sign reverses. The firm size has no direct impact on shareholders utility, but influences them through its impact on profit, dividend paid out policy and market valuation. Under low entry threat conditions the indirect effect is negative, while under high entry threat conditions the sign reverses.

Exhibit 1

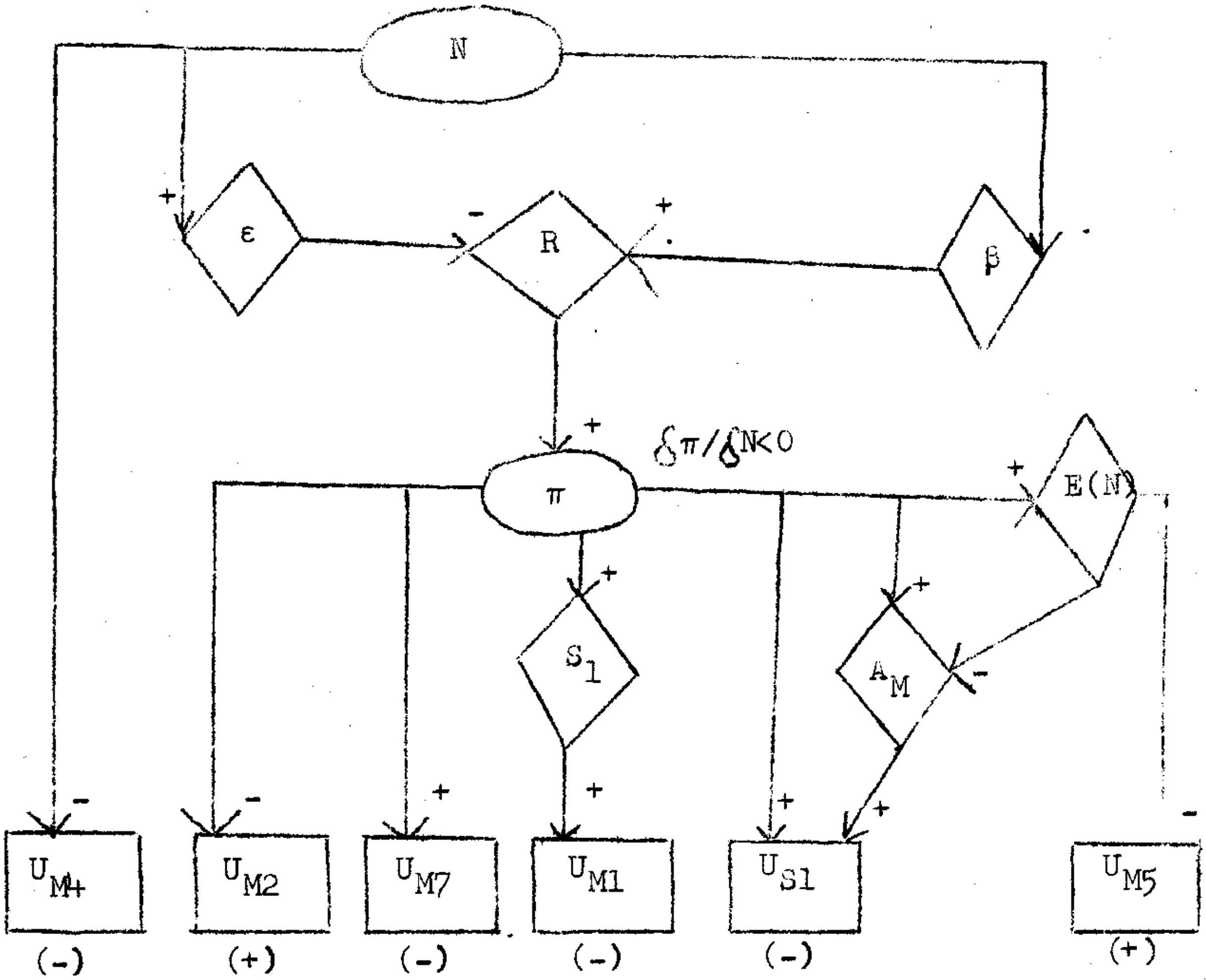
Causal Links From Exogenous Variables



Direct effect of A_B on U_M is (+)

Indirect effect of A_B on U_M is (-) if its effect on π is (-) and $U_{M7}>U_{M2}$

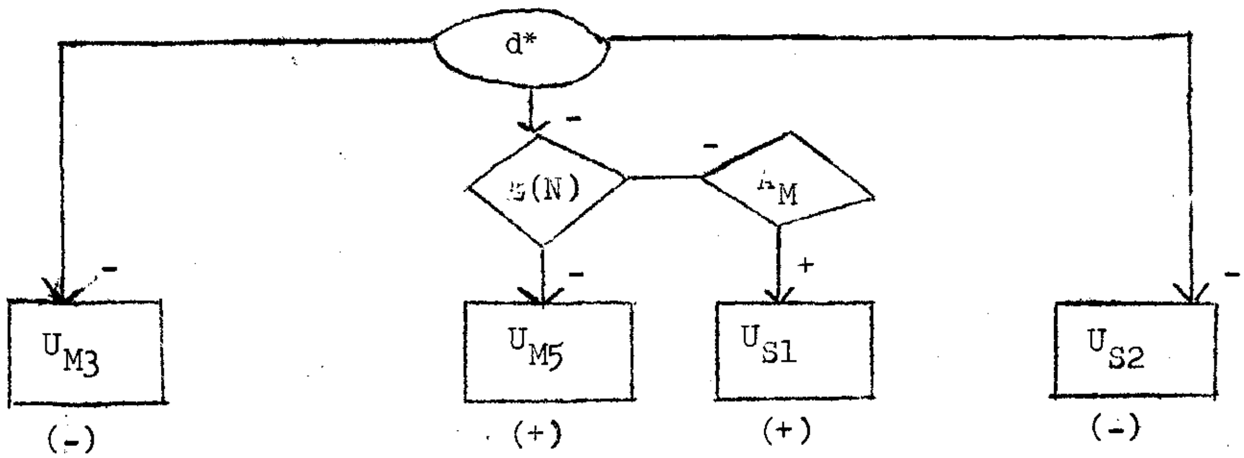
Indirect effect of A_B on U_S is (-) if its effect on π is (-) and $\eta_{A_M, E(N)}$ is not too large.



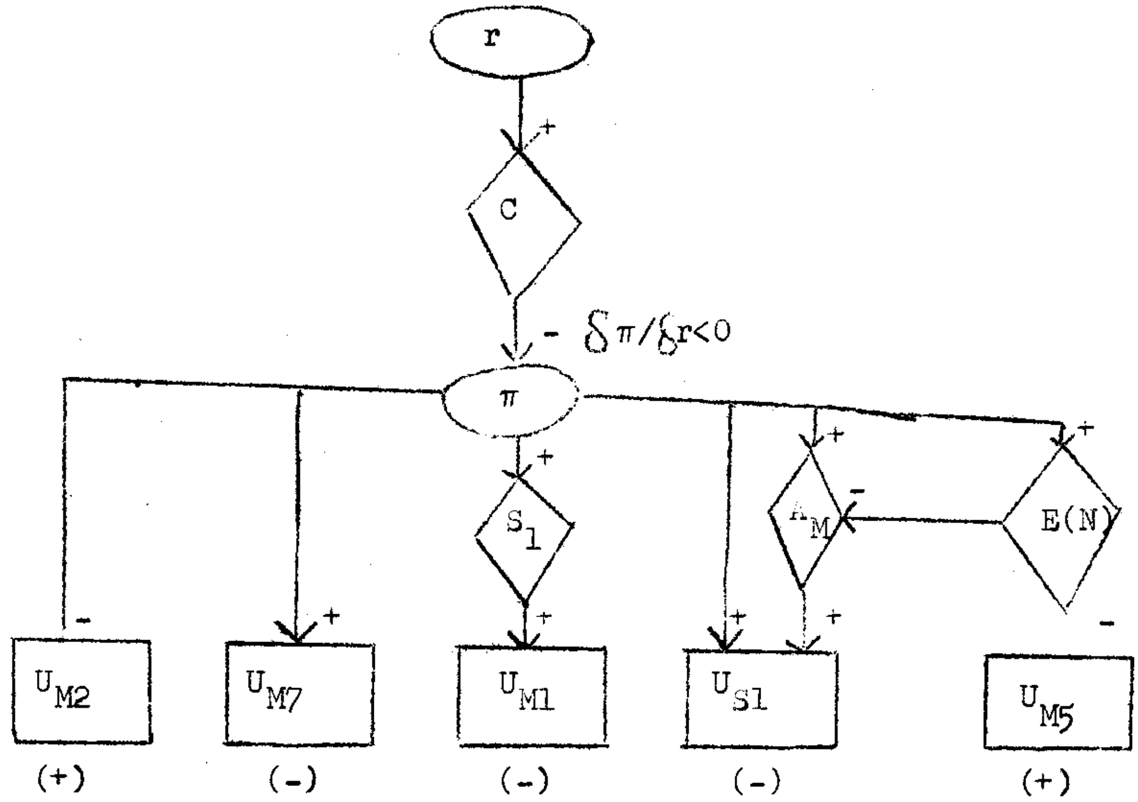
Direct effect of N on U_M is (-)

Indirect effect of N on U_M is (-) if elasticity of E(N) with respect to π $\eta_{E(N),\pi}$ is not too large and $U_{M7} > U_{M2}$

Indirect effect of N on U_S is (-) if η_{A_M}, E(N) is not too large.

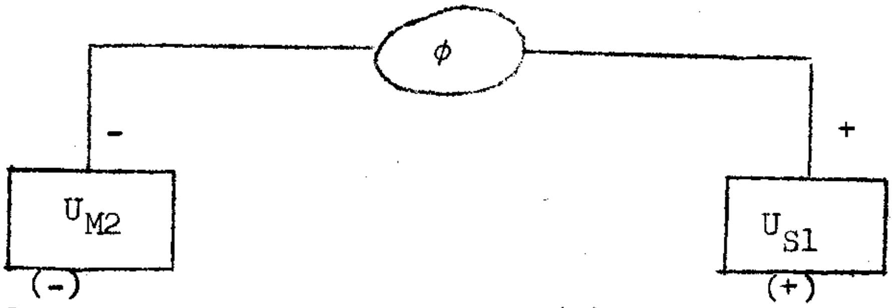


Direct effect of d* on U_M is (-)
Direct effect of d* on U_S is (-)
Indirect effect of d* on U_M is (+)



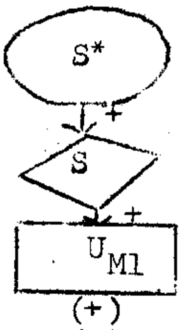
Indirect effect of r on U_M is (-) if ${}_{E(N),\pi}$ is not too large and $U_{M7}>U_{M2}$

Indirect effect of r on U_S is (-) if $\eta_{A_M,E(N)}$ is not too large.



Direct effect of ϕ on U_M is (-)

Direct effect of ϕ on U_S is (+)



Effect of S* on U_M is (+)

3.5.2 The Number of Units in the industry (N)

The number of units in the industry (proxying the competitive structure) has a direct negative impact on the managerial utility, since an increase in product competition decreases the managerial discretions. The indirect route is through the elasticity and demand shift parameters, N, influencing the profit function and thereby influencing indirectly managerial utility via dividend paid out, salary, profit level and the number of potential entrants. The indirect effect is negative under low entry threat conditions, while with high entry threats, the impact is reversed. Like the firm size, the number of firms indirectly influences shareholders' utility through profits and is negative under low entry threats condition. The sign reverses with increase in entry threat conditions.

3.5.3 The Cost of Capital (r)

The cost of capital influences both managerial as well as shareholder's utility function through its impact on profit levels only -- in a negative way. However, with high entry threats the sign reverses since with high costs entry is deterred.

3.5.4 Dividend Rate (ϕ)

The dividend rate of the firm has a direct impact on shareholders' utility and a negative impact on managerial utility.

3.5.5 The Industry Average Dividend Rate (d^*)

The industry average dividend rate has similar direct (negative) and indirect (positive) impacts on managerial and shareholders' utility. The indirect effect is felt through the entry conditions and the sign will reverse if entry threats are initially high.

3.5.6 The Market Salary (S^*)

The market salary for management has a positive impact on the managerial utility function.

Thus, we see that when entry threats are great, this reverses the impact of firm size (A_B), number of firms in the industry (N), cost of capital (r) and average industry dividend rate (d^*) on utilities of management (U_M) and shareholder (U_S).

4. Analysis of the First Order Conditions

We initially solve the model of section 3.3 neglecting the role of labour. Labour is introduced as a productive factor subsequently.

4.1 Firm Size (A_T) and Dividend rate (ϕ) as Choice Variables

Maximising $U = U_S^{\alpha} U_M^{1-\alpha}$ with respect to the remainign choice variables A_B and we conclude that the First Order Conditions are[1] :

$$(13) \quad \frac{\delta U}{\delta A_B} = \alpha U_S^{\alpha-1} U_M^{1-\alpha} \iota U_{S1} (\phi + A_{M1}) (-\frac{\pi}{A_B}) +$$

[1] The computation is shown in APPENDIX I.

$$U_{S1}\ A_{M2}\ \frac{f1\lambda}{Q} + (1-\alpha)\ U_S^{\alpha}\ \ U_M^{-\alpha}$$

$$[S_1(\frac{\delta\pi}{\delta A_B})\ U_{M1} + U_{M2}\ \phi\ (\frac{\delta\pi}{\delta A_B}) + U_{MS}\ \frac{f1\lambda}{Q} +$$

$$U_{M6} + U_{M7}\ \ \frac{\delta\pi}{\delta A_B}] = 0$$

and

$$(14)\quad \frac{\delta U}{\delta\phi} = \alpha\ U_S^{\alpha-1}\ \ U_M^{1-\alpha}\ \ [U_S, \pi] + (1-\alpha)\ U_S^{\alpha}\ \ U_M^{-\alpha}$$

$$(U_{M2}\pi) = 0$$

equation (14) can be rewritten as

$$\frac{\alpha}{U_S}\ U_{S1} + \frac{(1-\alpha)}{U_M}\ U_{M2} = 0$$

$$\text{or,}\quad \frac{\alpha\ U_{S1\phi}}{U_S} = -\ \frac{(1-\alpha)\ U_{M2\phi}}{U_M}$$

$$(15)\quad \text{or,}\quad \frac{\alpha}{\mu_{S\phi}} = -\ \frac{(1-\alpha)}{\mu_{M\phi}}$$

where, $\mu_{i\phi}$ = elasticity of utility with respect to ϕ for i = S, M.

An examination of equations (13) and (15) allows us to arrive at the following conclusions:

Result 1: The higher is the bargaining power of shareholder (α), the higher will be the dividend rate (ϕ), *ceteris paribus*.

Result 1 has the following interesting corollary:

Corollary 1: The percentage of earnings retained is greater the more diluted is shareholding (i.e., the lower is α).

If we substitute the profit maximising condition into equation (13) we obtain:

(16) $\left[\frac{\alpha}{U_S} U_{S1} A_{M2} + \frac{(1-\alpha)}{U_M} U_{M5}\right] \frac{f1\lambda}{Q} + \frac{1-\alpha}{U_M} U_{M6} > 0$

We thus have the following familiar result from the literature:

Result 2: At the bargaining equilibrium, productive assets (A_B) are higher than it would be for profit maximisation[3].

If we restate this result we get the following condition:

Corollary 2: At the bargaining equilibrium point $\frac{\delta\pi}{\delta A_B} < 0$, that is MR<MC.

Further analysis of the first order conditions can be carried out by examining the limiting conditions $\alpha \to 1$ and $\alpha \to 0$.

Case 1: If $\alpha \to 1$, that is, owners are managers, then ϕ is indeterminate since it depends on long-run objectives of the owners. If it is assumed that $\phi = 1$, then we have $U = U_S$, if $\alpha = 1$.

(17) $\frac{\delta U}{\delta A_B} = U_{S1} (\phi + A_{M1}) \frac{\delta\pi}{\delta A_B} + U_{S1} A_{M2} \frac{f1\lambda}{Q} = 0$

and at profit maximisation point, i.e. $\frac{\delta\pi}{\delta A_B} = 0$, we have,

(18) $V_S = U_{S1} A_{M2} \frac{f1\lambda}{Q} > 0$

where, V_S = market value of firm for shareholders.

Examining equations (17) and (18) we can conclude the

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3. This result has been obtained previously by Williamson (1964

following:

Result 3: Even if shareholders have total control of the firm, profits will not be maximised as long as the market value of the firm is of importance to shareholders. Further, given the impact of E(N) on A_M, we have

Result 4: In the presence of high entry threats, the productive assets employed will be still larger than the profit maximising level as compared with the case of no entry threats.

Case 2: If $\alpha \to 0$, that is shareholding is extremely diluted so that cost of coalition formation among shareholders is very high, then

$$U = U_M,$$

and we have,

$$(19) \quad \frac{U}{A_B} = U_{M1} \; S_1 \frac{\delta\pi}{\delta A_B} + U_{M2} \frac{\delta\pi}{\delta A_B} + U_{M5} \frac{f1\lambda}{Q} + U_{M6} + U_{M7} \frac{\delta\pi}{\delta A_B} = 0$$

Evaluating equation (19) at the profit maximising point (i.e., letting $\frac{\delta\pi}{\delta A_B} = 0$) we get

$$(20) \quad U_{M5} \frac{f1\lambda}{Q} + U_{M6} = V_M > 0$$

where, V_M = market value of firm for managers.

Once again we arrive at the following conclusion:

Result 5: Even if shareholders have no control, productive assets employed are higher than at the profit maximising level.

Finally, we have the following result:

Result 6: The optimal value of productive asset (A_B) has a weight $\frac{\alpha}{U_S}$ for shareholders and $(1-\alpha)/U_M$ for management. Whether, the optimal level of A_B increases, decr or remains unchanged as the control of shareholders changes is indeterminate. It depends on both V_S and V_M as well as on the weights α/U_S and $(1-\alpha/U_M$. The level will, however, lie between the optimum level desired by each group separately.

4.2 Labour as a Choice Variable:

The First Order Condition with respect to labour use is:

$$(21)\quad \frac{\delta U}{\delta L} = \frac{U_{S2}\,\alpha}{U_S}\,A_{M2}\,\frac{f1\lambda L}{Q} + \frac{U_{M1}\,(1-\alpha)}{U_M}\,[S_1\frac{\delta\pi}{\delta L}] + \frac{(1-\alpha)}{U_M}\,U_{M6}\,\frac{\delta\pi}{\delta L} + (1-\alpha)\,\frac{U_{M5}\,f1\lambda L}{U_M Q} = 0$$

where,

$$\frac{\lambda L}{Q} = wL\,Q^{-1} - \varepsilon\,BQ^{-\varepsilon}\,Q_L = \frac{\delta(\pi/Q)}{\delta L}$$

If we evaluate the expression (21) at the profit maximising level (i.e., $\delta\pi/\delta L = 0$), we get

$$(22)\quad \frac{\alpha}{U_S}\,U_{S2}\,A_{M2}\,\frac{f1\lambda L}{Q} + \frac{(1-\alpha)}{U_M}\,U_{M5}\,\frac{f1\lambda L}{Q} > 0$$

Result 7: The firm will indulge in over employment as compared to the profit maximising level.

Corollary 3: If management have the tendency to value staff apart from reasons associated with its productivity increases, that is, if management perceive expansion of staff as means to furtherance of salary, status, power and prestige, and as a guarantee of survival (because size increases job security), then the extent of over-employment will increase.

To derive further, comparitive static properties of the model we work with a simplified version which exploits the insights obtained in this section.

5. A Simplified Version of the Model

In order to carry out the comparitive static analysis easily, it was preferred to deal with a simplified form of the general model, in which we assume that direct effects outweight indirect effects (see the causal structure in Exhibit I) whenever direct effects are present.

The simplified form of the model is given by[4]

$$(23)\quad U = U_S^{\alpha} \quad U_M^{1-\alpha}$$

$$(24)\quad U_M = U_M\,(S^*,\ \dot{N},\ d^*\ ,\ (1-\phi)\pi\ ;\ A_B)$$

$$U_{M1}>0\,;\ U_{M2}<0;\ U_{M3}<0\,;\ U_{M4}>0\,;\ U_{M5}>0;$$

$$U_{Mii}<0\,;\ U_{Mij} = 0,\ \text{if } i \neq j.$$

4 See the Appendix for the details

(25) $U_S = U_S \ (\phi \ \pi, \ d^*)$

$$U_{S1}>0 \quad U_{S2}<0 \quad U_{Sii}<0 \quad U_{Sij} = 0 \text{, if } i \neq j.$$

(26) $\pi = \pi \ (A_B, N, r) \quad \pi_1<0 \quad \pi_2<0 \quad \pi_3<0$

$$\pi_{11}<0 \quad \pi_{12}<0 \quad \pi_{13}<0$$

6. <u>Comparative Static in the Simplified Model:</u>

First Order Bargaining Equilibrium Conditions for the simplified form of the model are given by equations (27) and (28) below:

(27) $\frac{\delta U}{\delta \phi} = -(1-\alpha) \ U_S \ U_{M4} + \alpha \ U_M \ U_{S1} = 0$

(28) $\frac{\delta U}{\delta A_B} = U_{M4} \ \pi_1 + U_{M5} = 0$

Total differentiation of equations (27) and (28) and rearrangement of terms will yield:

(29) $$\begin{bmatrix} \Sigma_{14} & \Sigma_{15} \\ \Sigma_{24} & \Sigma_{25} \end{bmatrix} \begin{bmatrix} d\phi \\ dA_B \end{bmatrix} = \begin{bmatrix} & -\Sigma_{12}dN & & -\Sigma_{16}dr & \\ -\Sigma_{21}dS^* & -\Sigma_{22}dN & -\Sigma_{23}d^* & -\Sigma_{26}dr & -\Sigma_{27}d \end{bmatrix}$$

where, Σ_{ij} are given in APPENDIX I.

Now we have

(30) $\Delta = \Sigma_{14} \ \Sigma_{25} - \Sigma_{24} \ \Sigma_{15} < 0$

by the second order cpnditions for a maximum.

The comparative static analysis provides us with the following results[5] :

Result 8: (a) $\frac{d\phi}{d\alpha} > 0$ (b) $\frac{dA_B}{d\alpha} < 0$

As the bargaining power of shareholders increases, the dividend rate will also increase. This result is in line with Result 1 of the previous section. Also, as the bargaining power of shareholders increases, the size of productive assets in the firm decreases.

The next result concerns the effects of the average industry salary.

Result 9 : An increase in average industry salary (S^*) causes dividend rate (Productive asset) to increase (decrease) if shareholders are powerful. There is no impact if shareholding is diluted.

In our formulation, the average industry salary positively influences the firm's payment to management. Hence, when the shareholding is diluted (i.e., management is too powerful), its impact on dividend rate and productive asset is not felt.

However, when shareholders are powerful, since an increased level of industry average salary ensures an increase in managerial utility, shareholders in order to counterbalance their utility gains increases the dividend rate to restore the bargaining equilibrium. Further, they respond in this case by reducing productive assets as well, so as to achieve

5 Complete derivations are in APPENDIX I

higher profits and market valuation for the firm thus increasing shareholder's utility by this means also. From our examination of the causal structure of the model we saw that the impact of A_B, N, r, and d* on utility levels could conceivably get reversed in the presence of low entry barriers, since the attractiveness of the industry as a field of investment would be reduced. In Exhibit 2, we present the remaining comparitive static results of this section allowing for both high and low entry threats and for the cases of powerful managers and shareholders. We thus get 2 x 2 classification of predictions which can be subjected to empirical testing. These results have intuitive appeal in most cases.

In case of variations in the average industry dividend rate (d*), however, the interpretation of the results is not obvious. Take for example the case of relatively large entry barriers and powerful shareholders. Why should an increase in the average dividend rate in the industry cause them to decrease their dividend rate (ϕ) and increase the firm's capital base (A_B) If we remember that dividends are already high and A_B is closer to its profit maximising level as compared to what management prefer (given that shareholders are powerful) the reasoning becomes straightforward. The rise in d* cause both shareholders and management to lose utility.

EXHIBIT 2

Results of Comparative Static in the Simplified Model

ENTRY THREATS

	changes in	Low: Industry average dividend rate (d*)	Low: No. of firms in the industry (N)	Low: Cost of capital (r)	High: Industry average dividend rate (d*)	High: No. of firms in the industry (N)	High: Cost of capital (r)
Shareholders are powerful	Dividend rate (ϕ)	-	?	?	+	?	?
	Productive assets (A_B)	+	?	-	-	?	?
Management is powerful	Dividend rate (ϕ)	+	?	?	-	-	?
	Productive assets (A_B)	-	?	?	+	-	-

A summary of testable set of hypotheses is provided in APPENDIX II.

7. Extension and Future Directions

7.1 This model is static and hence does not incorporate the problems of leads and lags on the one hand and inter-temporal investment decisions on the other.

7.2 In Indian conditions, besides the usual entry detterants described in the literature, the government regulations, licensing procedures, etc. are known to have predominantly regulated entry into an industry. We have not incorporated these factors in our model.

7.3 The market-value criterion , if the assumption of perfect capital markets gets violated, will not be a substitute for the criterion of maximisation of the share-holders welfare, because it does not lead to the same investment decisions. However, studies on Indian Capital markets have revealed that it operates efficiently (Ram-chandran, 1985) and hence we are justified in operationalising the market-value criterion .

8. Summary and Conclusions

In this paper we have developed a general model of industrial organisation along the behavioural and managerial theories of firms. We have explicitly incorporated the role of bargaining power of management and shareholders and obtained bargaining equilibrium conditions with the help of Svejnar-Kalai variable bargaining-power function. The comparative static implications of the formulated model are also examined. The results have intuitive appeal in most cases. However, the impact of variations in the average industry dividend rate on choice variables -- firm's dividend rate and productive assets -- are counter-intuitive. For instance, in case of relatively large entry barriers and powerful shareholder, an increase in average industry dividend rate will force the firm's dividend rate to decline and capital base increases.

The senior author is currently engaged in empirical validation of the model in the context of Indian Industrial sector.

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APPENDIX 1

1.0 The General Model

In this Appendix we present the notations used, the model formulated and the details of computation and analyses.

1.1. Notations and Definitions

U_S = utility function of shareholders;

U_M = utility function of management;

U = weighted product of utilities of shareholders and management;

α = bargaining power of shareholders;

$(1-\alpha)$ = bargaining power of management;

S^* = salary of management;

S = average industry salary of management;

ϕ = dividend rate;

d^* = industry average dividend;

N = number of firms in the industry;

$E(N)$ = expected number of potential entrants;

A_B = book value of assets of the firm;

A_M = market value of the firm;

π = profits earned;

R = revenue function;

C = cost function;

ε = (constant) elasticity of demand;

β = demand shift parameters;

Q = production level;

r = cost of capital, and

w = labour wage rate.

1.2 The Formulated Model

We adopt the Svejnar-Kalai variable bargaining-power function to capture the bargaining power of the stakeholders--shareholders and management groups explicitly in the model. The stakeholders act as if maximising under complete information the weighted product of their utilities. Thus, we have

$$\max U = U_S^{\alpha} \quad U_M^{(1-\alpha)} \qquad (1)$$

We have developed utility functions of management and shareholders along the lines of managerial and behavioural theories of the firm. Accordingly, the utility of management is a function of salary, security, professional excellence, competitive structure of the industry in which the firm operates and the entry conditions to the industry. We can specify the managerial utility function as:

$$U_M = U_M\ (S/S^*,\ \phi\pi,\ d^*,\ N,\ E(N),\ A_B,\ \pi)$$
$$U_{M1}>0\ ;\ U_{M2}<0\ ;\ U_{M3}<0\ ;\ U_{M4}<0\ ;$$
$$U_{M5}<0\ ;\ U_{M6}>0\ ;\ U_{M7}>0\ ;\ U_{Mii}<0;$$
$$U_{Mij} = 0 \quad \text{if } i \neq j. \qquad (2)$$

We have already discussed the rationale for inclusion of these variables and the postulated signs in the section 3.4.

Similarly, the utility of shareholder is a function of dividend policy of the firm, the market value of the firm and the average industry dividend rate

$$U_S = U_S \quad (\phi\pi + A_M, d^*)$$

$$U_{S1}>0 \; ; \; U_{S2}<0 \; ; \; U_{Sii}<0 \; ; \; U_{Sij} = 0 \text{ if } i \neq j \qquad (3)$$

We have specified a general production function with productive assets and labour as the factors of production with the usual assumptions:

$$Q = Q\ (A_B, L)$$

$$Q_1>0 \; ; \; Q_2>0$$

$$Q_{11}<0 \; ; \; Q_{22}<0 \; ; \; Q_{12}>0 \qquad (4)$$

The cost function is specified in terms of cost of capital (rA_B) and wage bills (wL), where, r and w are exogenously determined:

$$C = r\ A_B + w\ L \qquad (5)$$

The profit function is indicated in residual form,

$$\pi = R - C \qquad (6)$$

While, the revenue function assumes a constant elasticity demand curve

$$R = \beta\ Q^{1-\varepsilon} \quad ; \quad \varepsilon>1 \text{ (constant)} \qquad (7)$$

However, the more the number of units in the particular industry, the more elastic will be the demand

$$\varepsilon = \varepsilon(N) \quad ; \quad \varepsilon_1>0 \qquad (8)$$

but with the increase in the number of firms in the industry the demand from each unit in the industry will decline

$$\beta = \beta(N) \quad ; \quad \beta_1 < 0 \quad (9)$$

The potential entrant in the model is assumed to be determined by per unit profit and the average industry dividend rate

$$E(N) = f(\pi/Q,\ d^*)$$

$$f_1 > 0 \ ; \ f_2 < 0 \ ; \ f_{ij} = 0 \text{ if } i \neq j \quad (10)$$

The market value of the firm will be governed by the profit levels of the firm, potential entrants and average industry dividend rate

$$A_M = A_M(\pi,\ E(N),\ d^*)$$

$$A_{M1} > 0 \ ; \ A_{M2} < 0 \ ; \ A_{M3} < 0 \quad (11)$$

The determinants of management salary are profit level and average management salary in the market

$$S = S(\pi,\ S^*)$$

$$S_1 > 0 \ ; \ S_2 > 0 \quad (12)$$

Now, we can state the set of equations of the formulated model:

1. max. $U = U_S^{\alpha}\ U_M^{1-\alpha} \quad ; \quad 0 < \alpha < 1$

2. $U_M = U_M(S/S^*,\ \phi\pi,\ d,\ N,\ E(N),\ A_B,\ \pi)$

$$U_{M1} > 0 \ ; \ U_{M2} < 0 \ ; \ U_{M3} < 0 \ ; \ U_{M4} < 0 \ ;$$
$$U_{M5} < 0 \ ; \ U_{M6} > 0 \ ; \ U_{M7} > 0 \ ;$$
$$U_{Mii} < 0 \ ; \ U_{Mij} = 0 \ \text{ if } i \neq j$$

3. $U_S = U_S\ (\phi\pi + A_M\ ,\ d^*)$

$U_{S1}>0\ ;\ U_{S2}<0\ ;\ U_{Sii}<0\ ;\ U_{Sij}=0\ \text{ if } i\neq j$

4. $Q = Q\ (A_B\ ,\ L)$

$Q_1>0\ ;\ Q_2>0$

$Q_{11}<0\ ;\ Q_{22}<0\ ;\ Q_{12}>0$

5. $C = r\ A_B + w\ L$

6. $\pi = R - C$

7. $R = \beta Q^{1-\varepsilon}$; $\varepsilon > 1$ (constant)

8. $\varepsilon = \varepsilon(N)$; $\varepsilon_1 > 0$

9. $\beta = \beta(N)$; $\beta_1<0$

10. $E(\dot{N}) = f(\pi/Q,\ d^*)$:

$f_1>0\ ;\ f_2<0\ ;\ f_{ij}=0\ \text{ if } i \neq j$

11. $A_M = A_M\ (\pi,\ E(N),\ d^*)$

$A_{M1}>0\ ;\ A_{M2}<0\ ;\ A_{M3}<0$

12. $S = S(\pi,\ S^*)$

$S_1>0\ ;\ S_2>0$

1.3 Computations

Substituting equations (4), (5) and (7) into (6) we can restate the profit function as

(13) $$\pi = \beta Q^{(1-\varepsilon)} - r.A_B$$

Now, per unit profit could be stated as

$$\pi/Q = (\beta Q^{(1-\varepsilon)} - r.A_B)\ /\ Q$$

or, (14) $$\pi/Q = \beta Q^{-\varepsilon} - r.A_B\ Q^{-1}$$

Replacing the value of profit function (13) in equation (12), we get the salary equation as

(15) $S = S[(\beta Q^{(1-\varepsilon)} - r.A_B), S^*]$

Similarly, substituting the per unit profit equation (14) in equation (10), we obtain the potential entrant function as

(16) $E(N) = f\ [(\beta Q^{-\varepsilon} - r.A_B\ Q^{-1}), d^*]$

Substituting equations (13) and (16) in (11) will yield the market value of the firm equation

(17) $A_M = A_M\ [(\beta Q^{(1-\varepsilon)} - r.A_B), f(\beta Q^{-\varepsilon} - r.A_B Q^{-1}), d^*]$

The dividend pay out policy could be shown as

(18) $\phi\pi = \phi(\beta Q^{(1-\varepsilon)} - r.A_B)$

and

(19) $\phi\pi + A_M = [(\phi + A_M)\ \beta Q^{(1-\varepsilon)} - r.A_B] +$
$A_M\ [(f(\beta Q^{-\varepsilon} - r.A_B Q^{-1}), d^*), d^*)]$

Thus, assuming an additive function we have the managerial utility function from equation (2)

$U_M = U_M\ [S/S^*, \phi\pi, d^*, N, E(N), A_B, \pi)$

where

(20) $S/S = S(\beta Q^{(1-\varepsilon)} - r\ A_B\ , S^*)$

(21) $\phi\pi = \phi(\beta Q^{(1-\varepsilon)} - r\ A_B)$

(22) $E(N) = f[(\beta Q^{-\varepsilon} - r\ A_B Q^{-1})\ , d^*)]$

(23) $\pi = (\beta Q^{(1-\varepsilon)} - r\ A_B)$

Similarly from equation (3) the shareholders' utility function is $U_S = U_S\ [(\phi\pi + A_M), d^*]$

where

(24) $(\phi\pi + A_M) = (\phi + A_M)\,\beta Q^{(1-\varepsilon)} - r.A_B +$

$A_M\,[(f(\beta Q^{-\varepsilon} - r.A_B Q^{-1}),\ d^*]$

The relevant partial differentials will be given by

(25) $\frac{\delta\pi}{\delta A_B} = (1-\varepsilon)\,\beta Q^{-\varepsilon}\,Q_1 - r$

(26) $\frac{\delta S}{\delta A_B} = S_1\,[(1-\varepsilon)\,\beta Q^{-\varepsilon}\,Q_1 - r]$

$= S_1\,\frac{\delta\pi}{\delta A_B}$

(27) $\frac{\delta(\phi\pi)}{\delta A_B} = \phi.\frac{\delta\pi}{\delta A_B}$

(28) $\frac{\delta(\phi\pi)}{\delta\phi} = \pi$

$\frac{\delta E(N)}{\delta A_B} = f_1\,[(-\varepsilon)\,\beta Q^{-(\varepsilon+1)}\,Q_1 - rQ^{-1} + rA_B\,Q^{-2}]$

$= f_1\,[rA_B Q^{-2} - \varepsilon\beta Q^{-(\varepsilon+1)}\,Q_1 - rQ^{-1}]$

$= \frac{f_1}{Q}\,[rA_B Q^{-1} - \varepsilon\beta Q^{-\varepsilon}\,Q_1 - r]$

(29) or, $\frac{\delta E(N)}{\delta A_B} = \frac{f_1\lambda}{Q}$

where $\lambda = rA_B Q^{-1} - \varepsilon\beta Q^{-\varepsilon} Q_1 - r$

(30) $\frac{\delta(\phi\pi + A_M)}{\delta A_B} = (\phi + A_{M1})\,\frac{\pi}{A_B} + A_{M2}\,\frac{f_1\lambda}{Q}$

(31) $\frac{\delta(\phi\pi + A_M)}{\delta\phi} = \pi$

1.4 First Order Conditions

Now maximising $U = U_S^{\alpha}\ U_M^{(1-\alpha)}$ with respect to the choice variables dividend rate (ϕ) and firm size (A_B) we conclude that First Order Conditions are:

$$(32)\quad \frac{\delta U}{\delta A_B} = \alpha U_S^{\alpha-1}\ U_M^{1-\alpha}\ [U_{S1}\ (\phi + A_{M1})\ (\frac{\delta \pi}{\delta A_B}) + U_{S1}\ A_{M2}\ \frac{f_1 \lambda}{Q}] + (1-\alpha)\ U_S^{\alpha}\ U_M^{-\alpha}$$
$$[S_1\ (\frac{\delta \pi}{\delta A_B})\ U_{M1} + U_{M2}\ \phi\ (\frac{\delta \pi}{\delta A_B}) + U_{M5}\ \frac{f_1 \lambda}{Q} + U_{M6} + U_{M7}\ (\frac{\delta \pi}{\delta A_B})] = 0$$

and

$$(33)\quad \frac{\delta U}{\delta \phi} = \alpha U_S^{\alpha-1}\ U_M^{1-\alpha}\ [U_{S1}\ \pi] + (1-\alpha)\ U_S^{\alpha}\ U_M^{-\alpha}\ [U_{M2}\ \pi] = 0$$

or, $\alpha U_S^{\alpha-1}\ U_M^{1-\alpha}\ [U_{S1}\ \pi] + (1-\alpha)\ U_S^{\alpha}\ U_M^{-\alpha}\ (U_{M2}\pi) = 0$

or, $\frac{\alpha}{U_S}\ U_{S1} + \frac{(1-\alpha)}{U_M}\ U_{M2} = 0$

Multiplying by ϕ we get

$$(33\text{-A})\quad \frac{\alpha U_{S1}\phi}{U_S} = -\frac{(1-\alpha)}{U_M}\ U_{M2}\phi$$

$$(34)\quad \frac{\alpha}{\mu_{S\phi}} = -\frac{(1-\alpha)}{\mu_{M\phi}}$$

where

$\mu_{i\phi}$ = elasticity of utility with respect to ϕ
for i = S,M

An examination of First Order Conditions in equation (32 and (34) allows us to derive the following conclusions:

Result 1 : The higher is the bargaining power of shareh (α), the higher will be the dividend rate (φ), *ceteris paribus*.

Result 1 has the following interesting corollary:

Corollary 1: The percentage of earnings retained is greater the more diluted is shareholding (i.e., the lower is α).

From equation (32) we have

$$\alpha U_S^{\alpha-1} U_M^{1-\alpha} \left[(U_{S1}\phi + U_{S1}A_{M1}) \frac{\delta\pi}{\delta A_B} + U_{S1}A_{M2} \frac{f_1\lambda}{Q} \right] + (1-\alpha)\, U_S^{\alpha} U_M^{-\alpha} \left[S_1 U_{M1} \frac{\delta\pi}{\delta A_B} + U_{M2}\, \phi \frac{\delta\pi}{\delta A_B} + U_{M5} \frac{f_1\lambda}{Q} + U_{M6} + U_{M7} \frac{\delta\pi}{\delta A_B} \right] = 0$$

$$\text{or,} \quad \left[\frac{\alpha U_{S1}\phi}{U_S} + \frac{(1-\alpha)\, U_{M2}\phi}{U_M} \right] \frac{\delta\pi}{\delta A_B} + \left[\frac{\alpha U_{S1}A_{M1}}{U_S} + \frac{(1-\alpha)}{U_M} (S_1 U_{M1} + U_{M7}) \right] \frac{\delta\pi}{\delta A_B} + \left[\frac{\alpha U_{S1}A_{M2}}{U_S} + \frac{(1-\alpha) U_{M5}}{U_M} \right] \frac{f_1\lambda}{Q} + \frac{(1-\alpha) U_{M6}}{U_M} = 0$$

But from equation (33-A) we know that

$$\frac{\alpha U_{S1}\phi}{U_S} + \frac{(1-\alpha)\, U_{M2}\phi}{U_M} = 0$$

Therefore, equation (32) can be rewritten as:

$$(35) \quad \left[\frac{\alpha U_{S1}A_{M1}}{U_S} + \frac{(1-\alpha)}{U_M} (S_1 U_{M1} + U_{M7}) \right] \frac{\delta\pi}{\delta A_B} + \left[\frac{\alpha U_{S1}A_{M2}}{U_S} + \frac{(1-\alpha) U_{M5}}{U_M} \right] \frac{f_1\lambda}{Q} + \frac{(1-\alpha) U_{M6}}{U_M} = 0$$

Now, if profits were maximised, then we would have

(36) $\frac{\delta\pi}{\delta A_B} = (1-\varepsilon)\ \beta Q^{-\varepsilon}\ Q_1 - r\ = 0$

and, from equation (29)

$\frac{\delta(\pi/Q)}{\delta A_B} = \qquad = rA_B Q^{-1} - \varepsilon\beta Q^{-\varepsilon}\ Q_1 - r$

or, $rA_B Q^{-1} - \varepsilon\beta Q^{-\varepsilon}\ Q_1 - r + \beta Q^{-\varepsilon} Q_1 - \beta Q^{-\varepsilon} Q_1$

but under profit maximising conditions

$\frac{\delta\pi}{\delta A_B} = (1-\varepsilon)\ \beta Q^{-\varepsilon}\ Q_1 - r = 0$ from equation (36)

Therefore, we have,

(37) $\frac{\delta(\pi/Q)}{\delta A_B} = \qquad = rA_B Q^{-1} - \beta Q^{-\varepsilon} Q_1 < 0$

Using these two conditions (36) and (37) in equation (35) we get

(38) $\left[\frac{\alpha U_{S1} A_{M2}}{U_S} + \frac{(1-\alpha)\ U_{M5}}{U_M}\right]\ \frac{f_1\lambda}{Q} + \frac{(1-\alpha)}{U_M}\ U_{M6} > 0$

Result 2: At the bargaining equilibrium, productive assets (A_B) are higher than it would be for profit maximisation.

If we restate this result we get the following condition:

Corollary 2: At the bargaining equilibrium point $\frac{\pi}{A_B} < 0$, that is MR<MC.

Now we examine the limiting conditions, when $\alpha \to 1$ and $\alpha \to 0$.

Case 1: If $\alpha \to 1$, that is shareholders are powerful and act as managers, then ϕ is indeterminate, since it depends on long run objectives of the owners. It may be assumed that

$\phi = 1$, then we have $U = U_S$, if $\alpha = 1$

then,

(39) $$\frac{\delta U}{\delta A_B} = U_{S1} (\phi + A_{M1}) \frac{\delta \pi}{\delta A_B} + U_{S1} A_{M2} \frac{f_1 \lambda}{Q} = 0$$

and at profit maximising point, that is, letting $\frac{\delta \pi}{\delta A_B} = 0$, we get

(40) $$V_S = U_{S1} A_{M2} \frac{f_1 \lambda}{Q} > 0$$

where, V_S = market value of firm for shareholders.

Examining equation (39) and (40) we can conclude the following:

Result 3: Even if shareholders have total control of the firm, profits will not be maximised as long as the market value of the firm is of importance to shareholders.

Further, given the impact of $E(N)$ on A_M, we have

Result 4: In the presence of high entry threats the productive assets employed will be still larger than the profit maximising level as compared with the case of lower threats.

Case 2: If $\alpha \to 0$, i.e., extremely diluted shareholding, so that the cost of coalition of shareholders is very high, then we have, $U = U_M$ and the First Order Conditions will be:

(41) $$\frac{\delta U}{\delta A_B} = U_{M1} S_1 \left(\frac{\delta \pi}{\delta A_B}\right) + U_{M2}\phi \left(\frac{\delta \pi}{\delta A_B}\right) + U_{M5} \frac{f_1 \lambda}{Q} + U_{M6} + U_{M7} \frac{\delta \pi}{\delta A_B} = 0$$

If we evaluate equation (41) at the profit maximising point (i.e., letting $\frac{\delta\pi}{\delta A_B} = 0$), we obtain

(42) $V_M = U_{M5} \frac{f_1 \lambda}{Q} + U_{M6} > 0$

where, V_M = market value of firm for managers.

Now, we arrive at the following conclusion:

Result 5: Even if shareholders have no control, productive assets employed are higher than at the profit maximising level.

Finally we have the following result:

Result 6: The optimal value of productive asset (A_B) has a weight of $\frac{\alpha}{U_S}$ for shareholders and $\frac{(1-\alpha)}{U_M}$ for management. Whether, the optimal level of A_B increases, decreases or remains unchanged as the control of shareholders changes, is indeterminate. It depends on both V_S and V_M (market valuation) as well as the weights ($\frac{\alpha}{U_S}$ and $\frac{1-\alpha}{U_M}$). The optimum level will, however, lie between the optimum level desired by each group separately.

1.4.1 Labour as a Choice Variable: It is assumed that a large labour force is not desired for any reason by management The First Order Condition with respect to labour use is :

(43) $$\frac{\delta U}{\delta L} = \frac{\alpha U_{S2}}{U_S} A_{M2} \frac{f_1 \lambda L}{Q} + \frac{(1-\alpha)}{U_M} U_{M1} S_1 \frac{\delta\pi}{\delta L} + \frac{(1-\alpha)}{U_M} U_{M6} \frac{\delta\pi}{\delta L} + \frac{(1-\alpha)\, U_{M5}}{U_M} \frac{f_1 \lambda L}{Q} = 0$$

(44) where, $\lambda_L = wL.Q^{-1} - \varepsilon\beta Q^{-\varepsilon} . Q_L - w = \frac{\delta(\pi/Q)}{\delta L}$

If we evaluate the expression (43) at the profit maximising level, (i.e., $\frac{\delta\pi}{\delta L} = 0$), we get

(45) $\frac{\alpha}{U_S} U_{S2} \; A_{M2} \; \frac{f_1 \lambda_L}{Q} + \frac{(1-\alpha)}{U_M} U_{M5} \; \frac{f_1 \lambda_L}{Q} > 0$

Result 7: The firm will indulge in over employment as compared to the profit maximising level. From the above result, we get the interesting corollary.

Corollary 3: If management have the tendency to value staff apart from reasons associated with its productivity increases, that is, if management perceive expansion of staff as means to furtherance of salary, status, power and prestige, and as a guarantee of survival, then the extent of over-employment will increase.

1.5 Comparitive Static

In order to derive comparative static properties of the model, we work with a simplified version of the model. Exhibit 1 traces the causal links from exogenous variables to utilities of management and shareholders. We assume that direct effects outweigh indirect effects whenever direct effects are present alongwith the indirect effects. Thus the simplified version of the model could be stated as :

(46) max. $U = U_S^{\alpha} \; U_M^{(1-\alpha)}$: $0<\alpha<1$

Among the exogenous variables, average industry salary (S^*), number of units in the industry (N), average industry dividend rate (d^*), dividend payout policy (ϕ) and profit level (π) which determines the retained earnings and productive assets (A_B) have a direct bearing on the managerial utility. Therefore,

(47) $U_M = U_M \, (S^*, N, d^*, (1-\phi)\, \pi, A_B)$

$U_{M1}>0$; $U_{M2}<0$; $U_{M3}<0$;

$U_{M4}>0$; $U_{M5}>0$; $U_{Mii}<0$; $U_{Mij} = 0$, if $i \neq j$.

As profit level and average industry dividend rate regulate the dividend payout policy, which in turn governs the market valuation, we can state the shareholder's utility function as

(48) $U_S = U_S \, (\pi, d^*)$

$U_{S1}>0$; $U_{S2}<0$; $U_{Sii}<0$;

$U_{Sij} = 0$, if $i \neq j$.

In order to complete the system of equation, we have to specify profit function. As it is evident from the causal structuring (Exhibit 1) profit is linked with productive assets (A_B), competitiveness of industry proxied by number of units in the industry (N) and cost of capital (r). Thus,

(49) $\pi = \pi \, (A_B , N, r)$

$\pi_1<0$; $\pi_2<0$; $\pi_3<0$;

$\pi_{11}<0$; $\pi_{12}<0$; $\pi_{13}<0$.

1.5.1 Simplified Version of the Model: Thus, the complete system of simplified version of the models comprises of four equations:

(46) max $U = U_S^{\alpha} \; U_M^{1-\alpha}$; $0<\alpha<1$

(47) $U_M = U_M \, (S^*, N, d^*, (1-\phi)\pi, A_B)$

$U_{M1}>0$; $U_{M2}<0$; $U_{M3}<0$;

$U_{M4}>0$; $U_{M5}>0$; $U_{Mii}<0$;

$U_{Mij} = 0$, if $i \neq j$.

(48) $U_S = U_S \, (\pi, d^*)$

$U_{S1}>0$; $U_{S2}<0$; $U_{Sii}<0$;

$U_{Sij} = 0$, if $i \neq j$, and

(49) $\pi = \pi \, (A_B , N, r)$

$\pi_1<0$; $\pi_2<0$; $\pi_3<0$;

$\pi_{11}<0$; $\pi_{12}<0$; $\pi_{13}<0$;

1.5.2 Analyses : First Order Bargaining Equilibrium Conditions for the simplified form are given by:

(50) $\frac{\delta U}{\delta \phi} = -(1-\alpha) \; U_S \, U_{M4} + \alpha U_M \, U_{S1} = 0$

(51) $\frac{\delta U}{\delta A_B} = (1-\alpha) \; U_S \, U_{M4} \, (1-\phi) \, \pi_1$

$+ \, (1-\alpha) \, U_S \, U_{M5} + \alpha \, U_M \, U_{S1} \, \phi \, \pi_1 = 0$

From equation (50) we have

$(1-\alpha) \, U_S \, U_{M4} = \alpha U_M \, U_{S1}$

Therefore, equation (51) can be rewritten as

$$\alpha U_M U_{S1} (1-\phi)\pi_1 + (1-\alpha) U_S U_{M5} + \alpha U_M U_{S1} \phi \pi_1 = 0$$

(51-A) or; $\alpha U_M U_{S1} \pi_1 + (1-\alpha) U_S U_{M5} = 0$

Otherwise, equation (51) can also be expressed as

$$(1-\alpha) U_S U_{M4} (1-\phi)\pi_1 + (1-\alpha) U_S U_{M5}$$
$$+ (1-\alpha) U_S U_{M4} \phi \pi_1 = 0$$

or, $(1-\alpha) U_S U_{M4} \pi_1 + (1-\alpha) U_S U_{M5} = 0$

or, $(1-\alpha) U_S [U_{M4} \pi_1 + U_{M5}] = 0$

(51-B) or $U_{M4} \pi_1 + U_{M5} = 0$

Thus, the First Order Conditions are:

(50) $-(1-\alpha) U_S U_{M4} + \alpha U_M U_{S1} = 0$

(51-A) $\alpha U_M U_{S1} \pi_1 + (1-\alpha) U_S U_{M5} = 0$

or (51-B) $U_{M4} \pi_1 + U_{M5} = 0$

Total differentiation of equation (50) will yield:

(50) $-(1-\alpha) U_S U_{M4} + \alpha U_M U_{S1} = 0$

(52) $U_S U_{M4} d\alpha - (1-\alpha) U_S U_{M44} [(1-\phi)\pi_1 dA_B + (1-\phi)\pi_2 dN$

$+ (1-\phi)\pi_3 dr] + (1-\alpha) U_S U_{M44} \pi d\phi - (1-\alpha) U_{M4} U_{S1}\phi$

$[\pi_1 dA_B + \pi_2 dN + \pi_3 dr] - (1-\alpha) U_{M4} U_{S1} \pi d\phi$

$- (1-\alpha) U_{M4} U_{S2} dd + U_M U_{S1} d\alpha + \alpha U_{S1} U_{M1} dS^*$

$+ \alpha U_{S1} U_{M2} dN + \alpha U_{S1} U_{M3} dd + \alpha U_{S1} U_{M4} (1-\phi)$

$[\pi_1 dA_B + \pi_2 dN) + \pi_3 dr] - \alpha U_{S1} U_{M4} \pi d\phi + \alpha U_{S1} U_{M5} dA_B$

$+ \alpha U_M U_{S11} \phi [\pi_1 dA_B + \pi_2 dN + \pi_3 dr] + \alpha U_M U_{S11} \pi d\phi$

(53) If $\Sigma_{21}\ dS^* + \Sigma_{22}\ dN + \Sigma_{23}\ dd^* + \Sigma_{24}\ d\phi$

$+ \Sigma_{25}\ dA_B + \Sigma_{26}\ dr + \Sigma_{27}\ d\alpha = 0$

then define,

(54) $\Sigma_{21} = \alpha\ U_{S1}\ U_{M1} > 0$

(55) $\Sigma_{22} = \pi_2\ [-(1-\alpha)\ (1-\phi)\ U_S\ U_{M44} - (1-\alpha)\phi\ U_{M4}\ U_{S1}$

$+ \alpha(1-\phi)\ U_{S1}\ U_{M4} + \alpha\phi\ U_M\ U_{S11}] +$

$\alpha\ U_S\ U_{M2} \gtreqless 0$

(56) $\Sigma_{23} = -(1-\alpha)\ U_{M4}\ U_{S2} + \alpha U_{S1}\ U_{M3} \gtreqless 0$

(57) $\Sigma_{24} = \pi[(1-\alpha)\ U_S\ U_{M44} - (1-\alpha)\ U_{M4}\ U_{S1}$

$-\alpha\ U_{S1}\ U_{M4} + \alpha\ U_M\ U_{S11}] < 0$

(58) $\Sigma_{25} = \pi_1[\alpha(1-\phi)\ U_{S1}U_{M4} + \alpha\phi U_M\ U_{S11} - (1-\alpha)(1-\phi)$

$U_S\ U_{M44} - (1-\alpha)\phi\ U_{S1}\ U_{M4}] + \alpha U_{S1}\ U_{M5} \gtreqless 0$

(59) $\Sigma_{26} = \pi_3[\alpha(1-\phi)\ U_{S1}\ U_{M4} + \alpha\phi U_M\ U_{S11} - (1-\alpha)\ (1-\phi)$

$U_S\ U_{M44} - (1-\alpha)\ \phi U_{S1}\ U_{M4}] \gtreqless 0$

(60) $\Sigma_{27} = U_S\ U_{M4} + U_M\ U_{S1} > 0$

Total differentiation of equation (51-B) will yield:

(51-B) $U_{M4}\ \pi_1 + U_{M5} = 0$

(61) $\pi_1\ U_{M44}\ (1-\phi)\ [\pi_1\ dA_B + \pi_2 dN + \pi_3 dr] - \pi_1 \pi U_{M44} d\phi$

$+ U_{M4}\ \pi_{11}\ dA_B + U_{M4}\ \pi_{12}\ dN + U_{M4}\ \pi_{13}\ dr + U_{M5} dA_B$

Let us define:

(62) $\Sigma_{12} = \pi_1\ U_{M44}\ (1-\phi)\ \pi_2 + U_{M4}\ \pi_{12} < 0$

(63) $\Sigma_{14} = -\pi\pi_1 U_{M44} < 0$

(64) $\Sigma_{15} = \pi_{12} U_{M44} (1-\phi) + U_{M4} \pi_1 + U_{M55} < 0$

(65) $\Sigma_{16} = \pi_1 U_{M44} + U_{M4} \pi_{13} < 0$

Thus, we have

(66) $\Sigma_{12} dII + \Sigma_{14} d\phi + \Sigma_{15} dA_B + \Sigma_{16} dr = 0$

For clarifying the signs of Σ_{2i}'s we will assume that elasticities of utilities for shareholders and managers are close, i.e., $\eta_{\cdot M4} = \eta_{\cdot S1}$

which implies

$(1-\alpha) \phi U_{M4} U_{S1} = \alpha (1-\phi) U_{S1} U_{M4}$

Therefore,

(67) $\Sigma_{21} = \alpha U_{S1} U_{M1} > 0$ for $\alpha \to 1$

$= 0$ for $\alpha \to 0$

(68) $\Sigma_{22} = \pi_2 [-(1-\alpha)(1-\phi) U_S U_{M44} - (1-\alpha)\phi U_{M4} U_{S1} + \alpha(1-\phi) U_{S1} U_{M4} + \alpha\phi U_M U_{S11}] + \alpha U_S U_{M2}$

if $\alpha \to 1$, then

(68-A) $\Sigma_{22} = \pi_2 \alpha \phi U_{S11} U_M + \alpha U_S U_{M2} \gtreqless 0$ (?)

if $\alpha \to 0$, then

(68-B) $\Sigma_{22} = -\pi_2 (1-\alpha) (1-\phi) U_S U_{M44} < 0$

(69) $\Sigma_{23} = -(1-\alpha) U_{M4} U_{S2} + \alpha U_{S1} U_{M3}$

if $\alpha \to 1$, then

(69-A) $\Sigma_{23} = U_{S1} U_{M3} < 0$

if $\alpha \to 0$, then

(69-B) $- U_{M4} U_{S2} > 0$

(70) $\Sigma_{24} = \pi[(1-\alpha) U_S U_{M44} - (1-\alpha) U_{M4} U_{S1} - \alpha U_{S1} U_{M4} + \alpha U_M U_{S11}] < 0$

for $\alpha \to 0$ and $\alpha \to 1$

$\Sigma_{24} < 0$

(71) $\Sigma_{25} = \pi_1 [\alpha(1-\phi) U_{S1} U_{M4} + \alpha\phi U_M U_{S11} - (1-\alpha)(1-\phi) U_S U_{M44} - (1-\alpha) U_{S1} U_{M4}] + \alpha U_{S1} U_{M5}$

if $\alpha \to 1$, then

(71-A) $\Sigma_{25} = \pi_1\phi U_{S11} U_M + U_{S1} U_{M5} > 0$

if $\alpha \to 0$, then

(71-B) $\Sigma_{25} = -\pi_1 (1-\phi) U_S U_{M44} < 0$

(72) $\Sigma_{26} = \pi_3 [\alpha(1-\phi) U_{S1} U_{M4} + \alpha\phi U_M U_{S11} - (1-\alpha) U_S U_{M44} - (1-\alpha) \phi U_{S1} U_{M4}]$

if $\alpha \to 1$, then

(72-A) $\Sigma_{26} = \pi_3\phi U_M U_{S11} > 0$

if $\alpha \to 0$, then

(72-B) $\Sigma_{26} = -\pi_3 (1-\phi) U_S U_{M44} < 0$

(73) $\Sigma_{27} = U_S U_{M4} + U_M U_{S1} > C$

for $\alpha \to 1$ and $\alpha \to 0$

$\Sigma_{27} > 0$

From the causal structuring of the model (Exhibit 1) it is evident that the signs of coefficients with respect to N, d^*, r and π_B will reverse if entry threat heightens because of the indirect effect through the potential entrants variable [E(N)]. Therefore, we can represent the signs of Σ_s as shown in the Exhibit 3 .

EXHIBIT 3

Signs of the Coefficients

Coefficients		Signs			
		Low Entry Threats		High Entry Threats	
		Shareholders are powerful	Management is powerful	Shareholders are powerful	Management is powerful
Σ_{12}	all signs are negative	—	—	—	—
Σ_{14}		—	—	—	—
Σ_{15}		—	—	—	—
Σ_{16}		—	—	—	—
Σ_{21}		+	0	No impact	
Σ_{22}		?	—	?	—
Σ_{23}		—	+	+	—
Σ_{24}		—	—	No impact	
Σ_{25}		+	—	—	+
Σ_{26}		+	—	—	+
Σ_{27}		+	+	No impact	

Thus, we have

$$(74)\quad \begin{bmatrix} \Sigma_{14} & \Sigma_{15} \\ \Sigma_{24} & \Sigma_{25} \end{bmatrix} \begin{bmatrix} d\phi \\ dA_B \end{bmatrix} = \begin{bmatrix} -\Sigma_{12}dN - \Sigma_{16}dr \\ -\Sigma_{21}dS - \Sigma_{22}dN - \Sigma_{23}dd - \Sigma_{26}dr - \Sigma_{27}d\alpha \end{bmatrix}$$

and

$$(75)\quad \Delta = \Sigma_{14}\,\Sigma_{25} - \Sigma_{24}\,\Sigma_{15} < 0.$$

by the second order conditions for a maximum.

The comparative static analyses provide us:

$$(76)\quad \frac{d\phi}{d\alpha} = \frac{1}{\Delta}\begin{bmatrix} 0 & \Sigma_{15} \\ -\Sigma_{27} & \Sigma_{25} \end{bmatrix} = \frac{\Sigma_{15}\,\Sigma_{27}}{\Delta} > 0$$

$$(77)\quad \frac{dA_B}{d\alpha} = \frac{1}{\Delta}\begin{bmatrix} \Sigma_{14} & 0 \\ \Sigma_{24} & \Sigma_{27} \end{bmatrix} = \frac{-\Sigma_{14}\,\Sigma_{27}}{\Delta} < 0$$

$$(78)\quad \frac{d\phi}{dS^*} = \frac{1}{\Delta}\begin{bmatrix} 0 & \Sigma_{15} \\ -\Sigma_{21} & \Sigma_{25} \end{bmatrix} = \frac{\Sigma_{21}\,\Sigma_{15}}{\Delta} > 0$$

$$(79)\quad \frac{dA_B}{dS^*} = \frac{1}{\Delta}\begin{bmatrix} \Sigma_{14} & 0 \\ \Sigma_{24} & -\Sigma_{21} \end{bmatrix} = \frac{-\Sigma_{21}\,\Sigma_{14}}{\Delta} < 0$$

$$(80)\quad \frac{d\phi}{dd^*} = \frac{1}{\Delta}\begin{bmatrix} 0 & \Sigma_{15} \\ -\Sigma_{23} & \Sigma_{25} \end{bmatrix} = \frac{\Sigma_{23}\,\Sigma_{15}}{\Delta} \gtreqless 0$$

$$(81)\quad \frac{dA_B}{dd^*} = \frac{1}{\Delta}\begin{bmatrix} \Sigma_{14} & 0 \\ \Sigma_{24} & -\Sigma_{23} \end{bmatrix} = \frac{-\Sigma_{23}\,\Sigma_{14}}{\Delta} \gtreqless 0$$

(82) $$\frac{d\phi}{dN} = \frac{1}{\Delta}\begin{bmatrix} -\Sigma_{12} & \Sigma_{15} \\ -\Sigma_{22} & \Sigma_{25} \end{bmatrix} = \frac{\Sigma_{15}\,\Sigma_{22} - \Sigma_{12}\,\Sigma_{25}}{\Delta} \gtreqless 0$$

(83) $$\frac{d\lambda_B}{dN} = \frac{1}{\Delta}\begin{bmatrix} \Sigma_{14} & -\Sigma_{12} \\ \Sigma_{24} & -\Sigma_{22} \end{bmatrix} = \frac{\Sigma_{12}\,\Sigma_{24} - \Sigma_{14}\,\Sigma_{22}}{\Delta} \gtreqless 0$$

(84) $$\frac{d\phi}{dr} = \frac{1}{\Delta}\begin{bmatrix} -\Sigma_{16} & \Sigma_{15} \\ -\Sigma_{26} & \Sigma_{25} \end{bmatrix} = \frac{\Sigma_{15}\,\Sigma_{26} - \Sigma_{25}\,\Sigma_{16}}{\Delta} \gtreqless 0$$

(85) $$\frac{d\lambda_B}{dr} = \frac{1}{\Delta}\begin{bmatrix} \Sigma_{14} & -\Sigma_{16} \\ \Sigma_{24} & -\Sigma_{26} \end{bmatrix} = \frac{\Sigma_{16}\,\Sigma_{24} - \Sigma_{14}\,\Sigma_{26}}{\Delta} \gtreqless 0$$

EXHIBIT 4

Results of Comparative Static Analysis

	Entry Threats			
	Low		High	
	Shareholders are powerful	Management is powerful	Shareholders are powerful	Management is powerful
1. $\frac{d\phi}{dd^*} = \frac{\Sigma_{23}\Sigma_{15}}{\Delta}$	—	+	[illegible]	—
2. $\frac{dA_B}{dd^*} = \frac{-\Sigma_{23}\Sigma_{14}}{\Delta}$	+	—	—	+
3. $\frac{d\phi}{dN} = \frac{\Sigma_{15}\Sigma_{22}-\Sigma_{12}\Sigma_{25}}{\Delta}$	?	?	?	?
4. $\frac{dA_B}{dN} = \frac{\Sigma_{12}\Sigma_{24}-\Sigma_{14}\Sigma_{22}}{\Delta}$	?	?	?	—
5. $\frac{d\phi}{dr} = \frac{\Sigma_{15}\Sigma_{26}-\Sigma_{25}\Sigma_{16}}{\Delta}$	?	?	?	?
6. $\frac{dA_B}{dr} = \frac{\Sigma_{16}\Sigma_{24}-\Sigma_{14}\Sigma_{26}}{\Delta}$	—	?	?	—

The results of comparative static analyses are presented in Exhibit 4 . These results have intuitive appeal in most cases.

In the case of variations in the average industry dividend rate (d*), however, the interpretations of the results is not obvious. Take for example the case of relatively large entry barriers and powerful shareholders. Why should an increase in the average dividend rate in the industry cause them to decrease their dividend rate (ϕ) and increase the firm's productive assets (A_B). If we remember that dividends are already high and A_B is closer to its profit maximisation level as compared to what management prefer (given that shareholders are powerful) the reasoning becomes straight forward. The rise in average industry dividend rate (d*) cause both shareholders and management to lose utility.

APPENDIX II

A SUMMARY OF TESTABLE HYPOTHESES

1. The percentage of earnings retained should be greater the more diluted is shareholding.

2. In the presence of high entry threats, average firm size will be larger than in the case of low entry threats.

The hypothesized signs for changes in parameters: industry average dividend rate (d^*), number of firms in the industry (N), unit cost of capital (r) and average managerial salary (S^*) on dividend rate (ϕ) and firm size (A_B) are shown in Exhibit 5.

For instance, read

3. Hypothesis 1.1 : A firm with powerful shareholders under low entry threats will respond to an increase in the industry average dividend rate by decreasing its own dividend rate.

4. Hypothesis 1.3 : A firm with powerful shareholders under low entry threats, will probably enhance its dividend rate if the cost of capital goes up.

5. Hypothesis 1.7 : The impact of changes in cost of capital on firm's dividend rate cannot be predicted unambiguously when shareholders

are powerful under the conditions of high entry threats.

6. Hypothesis 4.1. : Under low entry threats, a firm with powerful management will respond to an increase in industry average dividend rate by a reduction in its firm size (A_B).

7. Hypothesis 4.3 : Under low entry threats, a firm with powerful management, will probably reduce its productive asset size with an increase in unit cost of capital.

8. Hypothesis 4.5 : Under high entry threat conditions, a firm with powerful management, will increase its firm size in response to a hike in the industry average dividend rate.

9. Hypothesis 4.6 : Under high entry threat conditions, an increase in the number of firms in the industry will induce powerful managers to effect a reduction in firms productive asset.

Exhibit 5

Hypothesized Signs

Entry Threats

Low ---High

	Parameters / Policy Variables	Industry average dividend rate (d^*)	Number of firms in an industry (N)	Unit Cost of capital (r)	Average Managerial Salary (S^*)	Industry average dividend rate (d^*)	Number of firms in an industry (N)	Unit Cost of capital (r)
Shareholders are powerful	Dividend rate (ϕ)	1.1 −	1.2 (−)?	1.3 (+)?	1.4 +	1.5 +	1.6 (−)?	1.7 ?
	Firm size (A_B)	2.1 +	2.2 (−)?	2.3 −	2.4 −	2.5 −	2.6 (−)?	2.7 ?
Management is powerful	Dividend rate (ϕ)	3.1 +	3.2 ?	3.3 (−)?	3.4 0	3.5 −	3.6 −	3.7 ?
	Firm size (A_B)	4.1 −	4.2 ?	4.3 (−)?	4.4 0	4.5 +	4.6 −	4.7 −