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BUSINESS GROUPS AND DIVIDEND POLICY:EVIDENCE ON INDIAN FIRMS

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Business groups and dividend policy: Evidence on Indian firms[?]

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Abstract

This paper synthesizes the transaction cost theory of dividend policy with the market failure and political economy theories of business groups in emerging markets: while the former suggests that dividend policy is inversely related to dependency on external finance, the latter theories imply that dividend policies of group-affiliated firms are mainly determined by group considerations. We use a sample of 1412 firms (comprising 858 independent firms and 554 group-affiliated firms), refined from the universe of all quoted and unquoted Indian private sector firms available on PROWESS, totalling 6548 firms, and comprising 4506 independent firms and 2042 group affiliated firms. Qualitative and limited dependent variable econometric techniques are applied to the data in order to disentangle the determinants of dividend policy of group-affiliated versus independent firms. The main findings are that while the decision to pay dividends is sensitive to transaction cost considerations regardless of group-affiliation, the payout level of group-affiliated firms is less sensitive to transaction cost considerations compared with the case of independent firms.

Keywords: dividend policy; business groups; Indian firms

1. Introduction

Business-groups are a common feature of the Indian business environment as they are in many other emerging markets. Many of these groups started as a family business where the family has maintained controlling interests even after the business has gone public. Various explanations for the business group phenomenon in emerging markets have been suggested by various studies, some of which will be subsequently mentioned. A common explanation is that the business group structure, which typically includes firms in a wide variety of industries, has evolved in emerging markets to mitigate informational problems and other market imperfections that characterise these markets.

This paper investigates the effect of group affiliation on the firm's dividend policy within an emerging market context. Pecking order theory and the transaction cost theory of dividend suggest that as internal funds are cheaper than external funds, a firm that depends more heavily on the latter will adopt a low payout policy. The gap between external and internal finance is expected to be particularly wide in emerging markets due to information asymmetry and other market imperfections. Hence dependency on external finance should be particularly important in determining the payout policies of firms in these markets.

However, it is often argued that the group structure can narrow the gap between the cost of using external and internal finance. For instance, costly external finance may be the result of an underdeveloped financial sector, which is unable to fulfil its traditional monitoring role. Here the group's headquarters may be well positioned to monitor member firms and to generate information thus substituting for inadequate financial intermediaries. The group may also be able to create internal markets, to save underwriting fees, or to secure the availability of external finance through its access to bureaucrats. Subsequently, it is hypothesised that group-affiliated firms are relatively less dependent on formal capital markets. Their dividend policies are thus less sensitive to investment needs, access to formal capital markets or to flotation cost. Instead, the dividend policies of group-affiliated firms are likely to be determined by the preferences of the controlling entity and by the cash needs of other group-members.

The contribution of this study is therefore threefold. First, to our knowledge, this is the first empirical work that examines dividend policy decisions in the context of business groups; specifically, the paper synthesizes the theory on business groups with the transaction cost theory of dividend. Existing studies of business groups in industrial as well as emerging markets have mainly focused on the effects of group affiliation on firms' performance and value. By focusing on the dividend policies of group-affiliated firms, this study offers a different perspective on the implications of the business group phenomenon. Second, the study adds empirical evidence to the dividend policy literature, and in particular to the literature on the transaction cost theory of dividend, in the context of an emerging market, given that most empirical studies of these issues are from developed markets. Third, the study contributes to the literature on business groups by looking at business groups in India (or business houses, as they are locally known), unlike most studies in this area, which exclusively focus on the experience of developed markets.

The structure of the paper is as follows. Section 2 begins with a brief review of the transaction cost theory of dividend, followed by a review of some studies on business groups in general and in emerging markets and India in particular. Section 3 describes the model and presents the predictions, while Section 4 describes the sample and group size and diversification measures. Section 5 presents a comparative analysis of the payout behaviour across independent firms and firms affiliated with groups at various levels of diversification, and reports the results from multivariate testing and estimation. The conclusions are offered in Section 6.

2. A selective review of the literature

2.1 The transaction cost theory of dividend policy

The literature on dividend policy is mainly concerned with explaining observations on the dividend practices of firms. For example, Lintner (1956) observes that dividend policy is important to managers and that the market reacts positively to dividend increase announcements and negatively to decreases. Two important theories to explain these observations include the signalling and agency theories of dividend. The signalling theory of dividend emphasises the role of dividends in conveying information about the

prospects of the firm. The agency theory of dividend emphasises the role of dividends in controlling agency behaviour. In both cases dividends reduce information or agency problems but the limitation of using dividends for these purposes is the firm dependency on external finance.

In the signalling models of Bhattacharya (1979) and Miller and Rock (1985), it is assumed that there is preference for internal finance and that dependency on external finance partly explains firms' dividend policies. What distinguishes between good and bad quality firms is that in the case of the former the gain from high dividends more than offset the associated cost. In Bhattacharya (1979) frictionless access to extra external financing is assumed to be unavailable, and the cost of paying high dividend is the issue cost of having to resort to outside financing to meet the dividend commitment. Thus dependency on external finance is determined by the flotation cost of raising external finance, which implies that firms that face lower issue costs are able to use more signalling. In Miller and Rock (1985) the cost of paying high dividends is the need to cut planned investment. Hence in Miller and Rock (1985) dependency on external finance, and thus the firm's dividend policy, are partly determined by the need for funds for expansion.

Moreover, dependency on external finance explicitly enters the dividend model in a number of studies. For example, in the cost minimisation model by Rozeff (1982), the optimal payout ratio is at the level that minimises the sum of agency costs and the cost of raising external finance. Hence, as is also implied in the signalling theories of Bhattacharya (1979) and Miller and Rock (1985), the optimal dividend policy is explicitly modelled as an inverse function of dependency on external finance.

This inverse relationship between dependency on external finance and the firm's dividend policy is referred to as the transaction cost theory of dividend. In Rozeff (1982), dependency on external finance is measured in terms of growth prospects and firm's risk. Other possible proxies for dependency on external finance include issue costs, ease of access to capital markets and the availability of surplus cash. However, regardless of how dependency on external finance is measured, the transaction cost theory of dividend is based on pecking order theory and thus on capital market imperfections. This is the reason that the transaction cost theory should explain

particularly well the dividend policies of firms that rely on capital markets that are characterised by distortions and imperfections. Indeed, these are the characteristics of many capital markets in emerging economies.

Capital markets in emerging economies are often differentiated from their counterparts in developed economies partly in terms of their effectiveness in fulfilling their intended functions. Failure in the case of the former is often attributed to high risk due to political and social instability, high transaction costs, lack of liquidity, and asymmetric information and agency problems. These problems are typically caused by lack of adequate disclosure, inappropriate trading systems, weak and erratic regulations and under-developed financial intermediaries that in efficient markets provide monitoring and the market for corporate control (Ngugi, Green and Murinde, 2001).

Indeed, Kumar and Tsetsekos (1999) argue that the institutional infrastructure of emerging markets tend to be inferior to that in developed markets in terms of the legal, technological and regulatory framework. A comparative analysis finds the financial and corporate sectors in emerging markets to be substantially less developed compared with those in developed markets. It is suggested that this can be partly explained by their more recent origins[1].

Similarly, Glen, Karmokolias, Miller and Shah (1995), note that the dividend levels in developing countries are substantially lower compared with developed countries. It is suggested that the lower dividend level could be a reflection of less efficient markets, leading to greater reliance on internal finance. The study also finds evidence in a group of developing countries of a positive relationship between payout rates and the fraction of total investment that is financed by retained earnings. This is taken as another indication of a relationship in developing countries between dividend policy and the gap between external and internal finance.

Consistent with the above discussion and particularly with Glen et al (1995), the dividend policies of firms in emerging markets should be particularly sensitive to

[1]Kumar and Tsetsekos (1999) apply discriminant and Logit analysis to test the hypothesis that the characteristics of emerging and developed markets are different; the hypothesis is supported by the results. For the financial sector, the mean value of MVGDP was 0.3729 for developed countries and 0.1546 for emerging countries; the F-test for difference in mean values was 16.1800, which was statistically significant. For the corporate sector, the mean value of RMVCO was 5.1568 for developed countries and 2.7295 for emerging countries; the F-test for difference in mean values was 157.8000.

dependency on external finance.[2] Thus the first hypothesis in this study is that a transaction cost model of dividend should have a good fit when applied to firms from an emerging economy. However, the business environment of many emerging economies are characterised by business groups, hence it is important to understand this organisational structure and its implications for the first hypothesis.

2.2 Business group theories

From corporations' point of view, one important function of the capital market is to provide a source of capital. As noted in Glen (1994), this is particularly important in emerging markets as often these are characterised by shortage of capital. Hence ineffective capital markets are particularly critical in environments where they are most likely to be found, and this is often stated as the reason for one feature common to these environments, namely the business group.

A business group is a collection of independent firms from various industries that are linked together either formally or informally. A formal link is achieved through cross shareholding where firms in the group hold the shares of other members. An informal link may include family or other social ties such as religion or ethnicity, or where firms in the group share common directors. This definition is based on the definition in Granovetter (1995), but draws from various other studies as is highlighted in the following discussion.

Granovetter (1995) proposes that the link between firms in a business group is stable but at the intermediate level. Thus each individual firm in the group is an independent legal entity with a separate management and board of directors. It is noted that most American conglomerates do not fall into the business group category. This is because subsidiaries are acquired on financial grounds thus the typical American conglomerate structure is unstable and the link among subsidiaries is weak. It is further

[2] Glen, Karmokolias, Miller and Shah (1995) compare the payout ratio for a composite of 25 developing countries followed by the IFC with the payout ratio of a global composite index of developed countries. For the developing countries sample, the payout ratio for 1993 is 66 percent while for the emerging markets sample the payout ratio ranges from 30 to 40 percent for the period 1986-1994. The study proceeds to assess the payout rates in a group of 7 developing countries including Turkey, Thailand, Malaysia, India, Jordan, Zimbabwe and Pakistan. This comparison yields a positive relationship between the payout rates and the fraction of total investment that retained earnings represented. It is concluded that in countries where firms have sufficient earnings to finance their investments, and thus relatively low amounts of finance has to be raised externally, dividend rates are higher. This is consistent with pecking order considerations and with the notion that in emerging markets, firms that need capital for investment tend to adopt a conservative payout policy.

noted, however, that other conglomerates, such as the Korean chaebol, can be classified as business groups because stable operational and social links are formed among all member firms.

Leff (1976) is one of the first studies to analyse the role of business groups, in mitigating capital market distortions. It is argued that the group structure provides a mechanism for pooling and mobilising managerial talent and technical knowledge, and that group diversification increases the flow of information thus reducing risk. Moreover, Leff (1976) argues that the group structure provides an efficient internal capital market, which is possible due to the group's superior access to resources. This access is achieved through the large proportions of corporate shares, which groups in emerging markets typically hold and which entitle them to large proportions of corporate profits. Further, groups' returns tend to be relatively high due to their monopoly power, and they also have access to large parts of private savings as they are typically connected to wealthy families.

Thus, according to Leff (1976), the group structure performs the functions of a capital market when the capital market is distorted, as is often the case in emerging markets. Guillen (2000) terms this the market failure theory, and although not the only theory to explain the business group phenomenon, it is the more popular reason cited in the literature. However, before expanding further on the market failure theory it is worth mentioning some of the competing views on the economic problems that have led to the creation of business groups.

Guillen (2000) discusses four theories to explain the importance of business groups in emerging markets including market failure, social structure, state autonomy, and the resource-based view. The first theory is the market failure theory, which, as mentioned above, explains the importance of business groups by the absence of well-functioning markets. The second theory is the social structure theory, which suggests that business organisations tend to correspond to the social structure in which they operate. Thus the business group organisation is typical of an autocratic social structure.

The third theory suggested by Guillen (2000) is the state autonomy theory, which relates business groups to the level of autonomy of states and to the level of corruption. Khanna and Palepu (2000b) refer to this theory as political economy or the rent-seeking

view.[3] Accordingly, business groups seek economic rent through exchanging bribes and political support in exchange for favours such as escaping curbing regulations. Further, Khanna and Palepu (2000b) note that favours are rare and costly since the risk to bureaucrats of getting caught increases with the number of favours granted. Diversified groups are the main recipients of these favours because they have greater opportunities to benefits from them.

The fourth theory suggested by Guillen (2000) is the resource-based view which explains the importance of the business group structure in terms of access to resources. In particular the resource-based view suggests that some entrepreneurs and firms posses the skills required for repeated entry into new industries. These skills become valuable when government policy makes access to resource difficult, such as when foreign trade and investment policies are asymmetric. Under such circumstances, those possessing the skills required for repeated entry into new industries will employ these valuable assets, leading to the creation of the business group.

Utilising data on the top ten business groups from nine markets, Guillen (2000) finds strong support for the resource-based view. Further, though weaker, support is also reported for the role of corruption (political economy theory) in explaining the importance of business groups. The results for the other theories, including the market failure theory and the social structure theory, are significant but bear the opposite sign to that predicted[4].

In spite of the rejection in Guillen (2000) of the market failure theory, the idea in Leff (1976) that the group structure mitigates capital market failures by forming internal capital market is supported by other studies. Chang and Choi (1988) point to the

[3] Brealey and Myers (2000) explain the concept of economic rent as profits in excess of the competitive level which when discounted give the Net Present Value of a project. It is explained that when an industry settles into long-run competitive equilibrium, its assets are expected to earn their opportunity cost of capital. Profits that more than cover the opportunity cost after the firm has settled into long-run competitive equilibrium, may arise if the firm has monopoly or market power.

[4] Guillen (2000) uses cross sectional OLS on data from the top ten business groups from nine markets (Argentina, Brazil, Colombia, India, Indonesia, South Korea, Mexico, Spain and Taiwan), for 1995. The importance of business groups is regressed on a constant, on the five-year lagged proxies for the various theories that explain business groups, and on group ranking dummies. The variables are: the dependent variable is the importance of business group (relative to size of the economy), measured as the ratio of total net sales of each group to the country's GDP; the financial market development variable, which is signed (-) and serves as a proxy for market failure theory, is measured as the ratio of stock market capitalisation to the country's GDP; the power distance variable, which is signed (+) and serves as a proxy for the social structure theory, is measured as the extent to which relationships in the society are based on autocratic and paternalistic assumptions; the state size and state autonomy variables, which are signed (+), are proxies for the state autonomy theory; the law and order variable, which is signed (-), is a proxy for the level of corruption; asymmetry in foreign direct investment variable, which is signed (+), is a proxy for the resource based view, measured as the absolute difference between z-scores for inward and outward stock of foreign direct investment; and dummy variables to indicate the group's place in the ranking of the top 10 business groups. Except the law and order variable, all variables are significant.

importance of the Korean business group, the chaebol, in improving the performance of affiliated firms. The chaebol structure typically consists of legally independent firms that are owned and controlled by a single family. Chang and Choi (1988) show that firms that are affiliated with well-diversified business groups can increase their profits. This is explained by the ability of the group structure to overcome market distortions, such as high government intervention policies. It is suggested that the diversified group can create a pool of funds from affiliated firms and reallocate these funds according to investment opportunities. This can be valuable when investment opportunities arise in an area considered by government to be of low priority, leading to difficulties in accessing formal capital markets.[5]

Claessens, Djankov, Fan and Lang (1999) propose that when external markets are distorted the combination of group-affiliation and firm-level diversification offers the lowest cost method of obtaining resources. They find that diversification, in high-income economies, has an adverse effect on excess value as the cost of diversification exceeds its benefit. This may be due to efficient intermediaries that reduce information and contracting problems thus reduce transaction costs for products, labour, and capital. However, it is found that diversification in low-income economies has a positive effect on excess value and this positive effect is particularly strong for group-affiliated firms.[6]

The benefits from diversification in emerging markets is also the subject of Khanna and Palepu (2000b), who look at the case of Chile over the period 1988 to 1996. In particular the study seeks to distinguish between benefits that are due to affiliation

[5] Chang and Choi (1988) utilise data on 182 Korean manufacturing firms, 1975-1984, using a Weighted Least Squares (WLS) cross sectional regression analysis with firm size (measured in terms of average total assets) used as weights. The model is of the form: profit = f(business group structure, control variables). Profit is measured as the ten-year average ratio of profit after tax but before interest to total assets. The group structure is represented by three dummy variables that reflect the level of the affiliated group's level of diversification. The control variables include proxies for firm's growth, market power, risk and size. Results show that D1, the dummy representing firms affiliated with the most diversified groups, has a significant and positive estimated coefficient with profit rate about 2% higher compared with other firms. D2 and D3, the dummies representing firms affiliated with less diversified groups, also have positive estimated coefficients but these are lower than in the D1 case and are not significant.

[6] Claessens, Djankov, Fan and Lang (1999) use data on 2,187 companies from nine Asian economies: Hong Kong, Indonesia, South Korea, Japan, Malaysia, Philippines, Singapore, Taiwan and Thailand, for 1991-1996, thus panel data with 9,326 firm-year observations, estimated using OLSQ and controlling for fixed time effects. Variable definitions are as follows. The variables used are: the natural logarithm of the ratio of the firm's actual value to its imputed value, where actual value is the market value of common equity plus the book value of debt and the imputed value is the sum of the products of the sales in each segment of a firm by the median market-to-sales ratio for each industry in each country; the high-income-country dummy variable equals one if the firm is from Hong Kong, Singapore, Taiwan, or Japan, and zero otherwise; the lower-middle-income-country dummy variable equals one if the firm is from Indonesia, Philippines, or Thailand, and zero otherwise; a dummy variable equals one if the firm is a member of a corporate group, and zero otherwise; a dummy variable equals one is the firm is non-group-affiliated, and zero otherwise; a dummy variable, which equals one if the firm has multiple segments, and zero otherwise; a control variable for the effects of short-term profitability, measured as operating income over sales; a control variable for leverage, measured as total debt to assets; and, a control variable for firm size, measured as the natural logarithm of firm assets.

with a diversified group, and benefits from group affiliation that are non-diversification-related. It is noted that non-diversification related benefits from group affiliation could be due to social links amongst member firms. Such links reduce transaction costs by encouraging information dissemination among group firms, and by providing low cost mechanism for resolving disputes and solving contracting problems. Indeed, after group-diversification is controlled for, Khanna and Palepu (2000b) find evidence of non-diversification related benefits from group affiliation.

Further, consistent with Claessens et al (1999), diversification is also found to be important, with a curvilinear relationship between firm performance and the level of group diversification. Khanna and Palepu (2000b) suggest that once group diversification exceeds a threshold level, the mainly fixed costs that are associated with diversification are more than offset by the benefits obtained. Particularly, once diversification exceeds a threshold level the group is able to enjoy a stable collective cash flow and an internal managerial labour market to meet the needs of the group. Alternatively the curvilinear relationship between firm performance and the level of group diversification is explained in terms of political economy or the ability of well diversified groups to accrue economic rents.

Khanna and Palepu (2000b) further assess the extent to which group affiliation effects change over time as the institutional context changes. It is hypothesised that liberalisation programmes and the introduction of democracy in Chile in 1990 should gradually bring about changes that reduce the benefits of group affiliation. These changes include more free flow of information, better enforcement of contracts and the gradual emergence of efficient intermediaries in the economy. Indeed it is found that the group diversification threshold above which firm performance increases, rises over time. Further, there is also evidence that non-diversification related benefits from group affiliation tend to diminish over time.[7]

In a paper reviewing theoretical and empirical work on the role of business groups in emerging markets, Khanna (2000) acknowledges that group affiliation enhances value due to the ability of the group structure to substitute for missing formal institutions.

[7] Khanna and Palepu (2000b) study 114 public firms in Chile, 1988-1996. 34 of the firms are group affiliated while 80 are unaffiliated. Year by year as well as panel analyses are undertaken where ROA is regressed on firm size, group membership, group

However, it is also acknowledged that the group structure can reduce value through the potential for minority shareholders' exploitation. In particular, even though group-affiliation may contribute to firm's efficiency, the risk for minority shareholders is that the gains will not accrue to them. Hence the presence of a controlling shareholder leads to conflicts of interests between controlling and minority shareholders and results in a discount in the value of the firm.

These two conflicting implications of group affiliation for firms are also investigated in Khanna and Palepu (2000a) in the special case of the Indian business houses. Khanna and Palepu (2000a) compare the performance of firms affiliated with diversified business houses with the performance of unaffiliated firms, but begin with a description of the Indian business houses. This description is relevant to this study and is therefore noted before looking at the Khanna and Palepu (2000a) comparison, because also this study focuses on Indian business houses.

Khanna and Palepu (2000a) note that the Indian business environment is characterised by containing several hundreds business houses but where firms are typically associated with only one group. Further, while Indian firms are commonly focused, the large business houses are usually well diversified. The link between member firms is typically the significant block of shares held by the family associated with the group, as well as common board members across the different firms in the group[8]. Granovetter (1995) further notes that the Indian business houses are characterised by multiple sources of social links among member firms including family, caste, religion, language ethnicity and region. Indeed, it is suggested that this multiple bases of solidarity are one of the sources of strength of the Indian business houses[9]. According to Khanna and Palepu (2000a) the structure of the Indian business

diversification and group diversification squared. The dependent variable, ROA, is measured as [net income + interest X (1-tax rate)] / total assets.

[8] Maman (1999) investigates the role of common directors across group-affiliated firms by looking at four of the most dominant business groups in Israel. The study carries a comparative analysis that spans the 14-year period (1974-1987), and includes 33 group-affiliated firms and 30 independent firms. Common to all 63 firms, however, is that each has at least one director that is also a board member in at least one other firm in the sample in every year of the study. Directorship ties within a group are measured as the proportion of internal ties out of all of the group's ties with other firms in the sample. Maman (1999) finds that substantial proportion of directorship ties is within business groups. In particular in the case of the industrial groups, Koor and ICI, on average 84% and 75% respectively of total directorship ties were within the group. In the case of the cross sector groups, IDB and Clal, internal directorship ties within the group were lower although still substantial at an average of 56% and 49% respectively. The study concludes that common directorship is one of the means to co-ordinate and control firms in the group.

[9] Granovetter (1995) suggests that the basis of solidarity of the group may also be its weakness. For example, business groups that are bound by immigrant ethnicity are always vulnerable to hostility from the native community. For that reason, business groups may try to link with powerful groups in the government or military, or to create multiple bases of solidarity.

environment and of the business houses are particularly suitable for investigating the conflicting implications of group affiliation.

On the benefits side, Khanna and Palepu (2000a) suggest that the Indian business house structure may help reducing labour market problems such as lack of skilled workforce, as well as achieve access to foreign technology. Further, group reputation can reduce information asymmetry between managers and the financial markets and enhance access to the investment community, and in particular to international investors.[10] Group's reputation can be created based on the group's track record for efficient allocation of capital. This may be due to the group having access to more information or being able to shift resources amongst firms. Reputation may also relate to the ability of the controlling entity to effectively monitor and influence the behaviour of the management teams of member firms (as in the context of Shleifer and Vishny, 1986). Further, reputation may also be linked to the group's preferential access to bureaucrats, which can make member firms attractive to domestic and international investors.

On the costs side, Khanna and Palepu (2000a) note that the potential for conflicts of interests between controlling and minority shareholders in group-affiliated firms may harm the reputation of these firms. Such conflicts may arise if the controlling entity pursue objectives other than shareholder wealth maximisation, such as investment in unprofitable projects due to family or group wide considerations. Similarly, the controlling family may push for management compensation schemes or management selection procedures that are inefficient[11]. Moreover, DeAngelo and DeAngelo (2000) question the value of a large shareholder in disciplining management.[12]

The empirical results in Khanna and Palepu (2000a) for India are consistent with the results in Khanna and Palepu (2000b) for Chile. In particular the results point to a quadratic relationship between firm performance and the diversification level of the

[10] Indeed, examining 1996 Indian data, Khanna and Palepu (2000a) find that international analysts collectively covered 180 group-affiliated firms but only 70 non-group affiliated fims. Further, a Tobit analysis of the number of analysts covering a given firm on firm size and group affiliation shows both to positively and significantly (at the 1% level) influence the dependent variable. Thus groups are relatively good at attracting international analysts and this in turn can further reduce information problems.

[11] Maman (1999) also points to possible conflicts of interest that may arise within business groups. Such conflicts can arise between the wish of member firms to maintain autonomy and the need of the controlling entity to monitor the separate firms, provide long-term planning for the group as a whole and allocate resources within the group.

[12] DeAngelo and DeAngelo (2000) study the case of a NYSE-listed firm, the Times Mirror Company (TM), which has been controlled by the Chandler family for 100 years. The study focuses on the period between 1980 and 1995, a period in which TM had experienced poor operating performance. It is concluded that the presence of a large block shareholder (the Chandler family) did not act as an effective device for disciplining management. A possible reason is stated as the personal ties that have developed between the management team at TM and the Chandler family.

group with which the firm is affiliated. At low level of group diversification, group affiliation has a negative effect on the performance of the firm. However, this relationship reverses once group diversification reaches a certain level. The findings suggest that affiliation with one of the most diversified Indian business houses add value. In accordance with the market failure theory, this value is achieved by substituting for missing institutions and overcoming informational inefficiencies. Alternatively, in line with political economy, highly diversified business groups can create value through superior access to bureaucrats in an economy characterises by high level of government intervention and corruption.[13]

Ghemawat and Khanna (1998) attempt to distinguish between these two theories by studying the reaction of two of India's largest business houses following the country's 1991 policy reforms. The Indian 1991 reforms were designed to move the economy from a planned to a market model. The idea is that an immediate and strong reaction by business groups to the introduction of the reforms implies that the original role of the group structure was to distort policy rather than to mitigate informational problems. The reasoning behind this idea is as follows.

The Indian economic reforms sought to address both the distortions caused by government intervention policies and the distortions caused by informational problems. However, while intervention policies can quickly be changed, informational problems require more time. Indeed, intervention policies such as the licensing system and price and competition controls were lifted, leading to an immediate downward impact on the ability of well connected groups to distort policy through preferential access to bureaucrats. This implies that if the reason for the presence of the group structure is to distort policy, the reaction by groups to the 1991 reforms should be immediate and radical. In contrast, the study notes that problems concerning enforcement of disclosure rules, liquidity and settlement of trades have not completely been eliminated immediately

[13] Khanna and Palepu (2000a) utilise data on 1,308 Indian private sector firms traded on the Bombay Stock Exchange for the year 1993, with OLS regression analysis of firm performance on group affiliation and control variables. Proxies for performance include Tobin's Q and Return On Assets. The variables used are: Tobin's Q, calculated as (market value of equity + book value of preferred stock + book value of debt) / (book value of assets); group diversification dummies, where group diversification is measured in terms of the number of industries in the group; the least diversified group dummy captures membership of groups with 1-4 industries; the intermediate diversified group dummy captures membership of groups with 5-7 industries; and the most diversified group dummy captures membership of groups with over 7 industries.

following the introduction of the reforms. This implies that if the reason, for the development of the group structure, is informational imperfections then groups would not react immediately to the introduction of the reforms.

Ghemawat and Khanna (1998) find evidence in support of the political economy theory, which they term the policy distortion explanation for the group structure. In particular the introduction of the Indian reforms resulted in the initiation of restructuring plans by Ballarpur Industries Limited (BILT) and RPG Enterprises, the two groups studied. The restructuring included reduction in group's diversity and entry into new sectors where access to bureaucrats could still offer value. These sectors include the power generation and telecommunications where permits requirements were not lifted.

Thus while the emphasis in the literature is on the market failure theory of business groups, Ghemawat and Khanna (1998) rule in favour of the political economy theory in the case of India. In this study no distinction is made between the various theories of business groups in emerging markets, but instead the focus is on these two theories. Explicitly, it is the market failure and political economy theories of business groups together that form the basis for the hypothesised affect of group affiliation on the firm's dividend decision. This hypothesis is now clarified.

The studies reviewed above suggest that using the capital market to obtain capital in an emerging market can be problematic due to various distortions. However, within emerging markets, group-affiliated firms may have better access to finance. The group may enhance profitability, ease information problems, create reputation, form internal markets, improve access to government grants or subsidies or distort other policies through preferential access to bureaucrats. The second hypothesis is therefore that the dividend policies of group-affiliated firms are less sensitive to the transaction cost of raising external finance in the formal capital market. Thus, as noted in the introduction, the main contribution of this study is the linking of the transaction cost theory of dividend with business group theory.

In short, the idea is to utilise the differences between independent and group affiliated firms in India to better understand the validity of the transaction cost theory of

dividends.[14] The next task is therefore to construct a model that links dependency on external finance, to the firm's payout ratio while allowing for a distinction between group affiliated and independent firms.

3. The model

The first hypothesis, as articulated above, is based on the idea that the gap between external and internal finance is typically high in emerging markets. Hence, the need for funds, access to and cost of raising external finance in the capital markets are particularly important determinants of the dividend policies of firms operating in these markets. The transaction cost model of dividends is formulated as follows:

$$PAYOUT_i = ? + ?_1 GROW_i + ?_2 REPUT_i + ?_3 FLOAT_i + ?_4 FCF_i + ?_i \qquad (1)$$

where PAYOUT is the dividend payout ratio; GROW is a measure of the rate of expansion; REPUT is a proxy for the ease of access to the capital market achieved through reputation; FLOAT is a proxy for flotation cost; and FCF is free cash flow. These variables are defined in Appendix A.

As described in Appendix A, the dependent variable, PAYOUT, is measured as the ratio of dividend to Profit Before Depreciation, Interest and Tax (PBDIT). The use of PBDIT in place of the more common measure of profit after tax is to ensure firms that pay dividend when their net profit is negative are not excluded. The RHS variables in equation (1) measure dependency on, access to and the cost of raising external finance in, the capital markets. The first three explanatory variables namely growth, reputation, and floatation cost, are measured by alternative proxies. The rate of growth of the firm is measured by four proxies denoted GROW1 to GROW4. GROW1 represents past growth and is defined as the average annual growth in sales over the previous five-year period. The remaining three growth proxies, GROW2 to GROW4 measure growth expectations

[14] This is in the spirit of Dewenter and Warther (1998), who assess the signalling theory of dividend by comparing the dividend policies of US firms with the policies of Japanese firms. The hypothesis there is that in Japan, and in particular within the Japanese keiretsu structure, there are less information problems hence less need for the dividend-signalling device. Instead, due to equity cross holding among members of a group, dividend policy can be used to distribute cash among member firms. Indeed using various methodologies, including an event study, logit analysis and the Lintner model, Dewenter and Warther (1998), find that keiretsu members experience smaller price reactions to dividend change announcements and that their dividends are more responsive to earnings changes.

in terms of R&D expenditure, PE ratio and the market to book ratio, respectively. Growing firms require more funds for investment, and as external finance is more expensive than internal finance, growing firms establish lower dividend policies. The nature of the relationship between the rate of growth and the payout ratio is therefore expected to be negative. Alternatively, it could be argued that for signalling purposes growing firms opt for high dividend to signal these opportunities, leading to a positive association between growth and payout.

The ease of access to the capital market is measured in terms of firm's reputation, which is represented by the firm size and age. REPUT1 and REPUT2 measure firm size in terms of book value of assets and market capitalisation respectively. REPUT3 measures reputation in terms of the age of the firm. A positive association between payout and reputation is predicted because firms with easy access to the capital market rely less on internal funds.

The flotation cost faced by a firm when raising funds in the capital market is measured by two proxies, FLOAT1 and FLOAT2. FLAOT1 is the standard deviation of the stock's daily rate of return over the year. In line with Crutchley and Hansen (1989) firms with larger standard deviation of returns are assumed to face higher flotation cost due to higher underwriting risk premiums.[15] FLOAT2 is an inverse measure of liquidity, which is based on relative trading days. It is defined as 1 minus the ratio of the days the company's stock traded on the Bombay Stock Exchange (BSE) to the number of days that trading took place on the exchange during the year. Both FLAOT1 and FLAOT2 are expected to be inversely related to the payout ratio because the cost of raising external finance is expected to have a negative impact on the payout ratio.

Free cash flow represents cash that is not required for operations or for investments. It is thus the surplus net cash flow available for dividends and is expected to be positively related to the payout ratio. The predictions in respect of this variable, as well as the other explanatory variables, are summarised in Table 1.

[15] Crutchley and Hansen (1989) assume that flotation cost have the following structure: (flotation cost) = ? + ? (rate of return standard deviation for the firm's common stock) + ? (the amount of capital raised). It is noted that there is economies of scale in flotation cost in the sense that underwriting fees per $1 raised decrease with the size of the issue. More relevant to the approach in this study, it is noted that firms with larger rate of return standard deviation pay higher floatation cost. Crutchley and Hansen (1989) interpret this as indicating that riskier firms pay higher underwriting risk premiums. Of course, how to proxy for firm's risk is a debatable issue, and as an alternative to the rate of return standard deviation other measure such as the average variance obtained from a GARCH model of volatility could have been used.

[Table 1 about here]

The predictions in Table 1 and the transaction cost model in equation (1) assume that the dividend decision can be expressed as a function of dependency on external finance. This is in line with the first hypothesis as stated at the end of sub-section 2.1. The second hypothesis, articulated at the end of sub-section 2.2, is that group affiliation mitigates formal markets' imperfections and makes dependency on external finance a less important determinant of the firm's dividend policy. To test the impact of group affiliation on the payout decision, the transaction cost dividend model of equation (1) is augmented with interaction terms as follows:

$$PAYOUT_i = ? + ?_1 GP_i + ?_1 GROW_i + ?_2 REPUT_i + ?_3 FLOAT_i + ?_4 FCF_i \quad (2)$$
$$+ ?_1 (GP\ GROW)_i + ?_2 (GP\ REPUT)_i + ?_3 (GP\ FLOAT)_i + ?_4 (GP\ FCF)_i + ?_i$$

where all variables are as defined above and GP is a dummy variable that equals 1 if the firm is group-affiliated and 0 otherwise (the variables are fully defined in Appendix A).

By including a group dummy, GP, the extended model of Equation (2) allows for the constant in the model to differ when the firm is group-affiliated. Furthermore, the extended model also allows for interaction terms between the group dummy variable and each of the other explanatory variables. In line with the second hypothesis, the expectation is that group-affiliation reduces reliance on formal markets. The estimated coefficients on all the interaction terms, excluding the free cash flow interaction term, are therefore predicted to have opposite signs to that on the explanatory variable on their own. These predictions are explained in more detail below.

The nature of the relationship between the rate of growth and the payout ratio is predicted in Table 1 to be negative. However, if groups are able to create internal markets, then the relationship between growth and payout in the case of group-affiliated firms should be weaker. This implies positive estimated coefficients on the interaction terms of the group-affiliation dummy and the growth variables, GROW1-GROW4.

Table 1 predicts a positive association between payout and the ease of access to the capital market as measured by REPUT1-REPUT3. However, in the case of group-

affiliated firms the association between the firm's reputation and its payout ratio is predicted to be weaker. The reason is that group-affiliated firms can rely on group reputation rather than on their own reputation. Hence negative signs are expected on the estimated coefficients of the interaction terms of the group-affiliated dummy and the reputation variables, REPUT1-REPUT3.

The flotation cost variables FLAOT1 and FLAOT2 are predicted in Table 1 to be inversely related to the payout ratio. In the case of group-affiliated firms this relationship is predicted to be weaker because the group may be able to enjoy lower flotation costs. For example, instead of the underwritten public offer, the firm may find it more attractive to raise funds by direct offering to its dominant shareholders being the group headquarters and member firms. This would result in substantial savings as noted in Smith (1977) and in Hansen and Pinkerton (1982)[16]. Thus with respect to the interaction terms of the group-affiliation dummy and the flotation variables, FLOAT1, and FLOAT2, the prediction is of positively signed estimated coefficients.

Free cash flow is expected to be positively related to the payout ratio. For group-affiliated firms, the free cash flow measure includes intra-group flows. If details of intra-group cash flows (such as dividend) were available separately, this could be deducted in arriving at the surplus cash figure. Such separation of group and non-group cash flows would facilitate testing of the extent to which the dividend decision of group-affiliated firms is insensitive to free cash availability due to cash provided by the group. However, this data is not available, thus there appears to be no strong justification for predicting that group-affiliated firms would be less sensitive to free cash flow. No prediction is therefore made regarding the nature of the relationship between the payout ratio and the interaction term of the free cash flow and the group-affiliation dummy.

[16] Hansen and Pinkerton (1982) note that the equity financing paradox, of why firms choose underwriting public offering over the cheaper method of non-underwritten direct offering, could be explained in terms of ownership control of the issuer. They identify all US direct offerings from the SEC Registered Offering Statistic tapes for the period January 1971 through December 1979, totalling 54 direct offers. It is then illustrated that the 13 largest direct offerings in their sample, are the equity issues of subsidiaries of American Telephone and Telegraph (ATT). It is noted that at levels of high control the direct offer amounts to passing a cheque from the dominant stockholder to the issuing firm, at very low flotation cost. If this observation is applied to the case of group-affiliated firms in India, then the conclusion is that these firms should use the direct offering route, saving underwriting fees and obtaining finance at competitive rates. (It may also be possible to argue that flotation expenses to various government agencies may be lower for group-affiliated firms if the group exercises its preferential access to bureaucrats. However, both the notion that group-affiliated firms will opt for non-underwritten direct offering, and the notion that these firms may enjoy lower flotation fees to government agencies are merely hypotheses that require further investigation.) In any event, for the purpose of this study, and based on these assumptions, the prediction is that flotation cost considerations are less likely to influence the dividend decision of group-affiliated firms.

Equation (2) includes the transaction cost variables, a group-affiliation dummy variable, and group-affiliation interaction terms. This extended model is applied to data from an emerging market, India, which is assumed to offer a good environment for testing the impact of business groups[17]. The next stage is the empirical procedure, which begins with a description of the sample and the construction of group size and diversification measures.

4. Data and measurement

4.1 The sample

The data are retrieved from PROWESS database provided by the Centre for Monitoring the Indian Economy (CMIE) and updated to 22 March 2001. The initial data set includes the universe of all quoted and unquoted Indian Private Sector firms available on PROWESS, totalling 6,548 firms, and comprising 4,506 independent firms and 2,042 group affiliated firms; the data are used to construct the group size and diversification measures as will be discussed below.[18]

The period studied is the year ending March 2000 which may be criticised as unrepresentative and arbitrary. However, group affiliation, which is at the centre of this study, is available on PROWESS only as a data variable at a given point in time. The use of one year is therefore rationalised by the wish to avoid making the assumption that group affiliation is stable over time.[19] The selection process involved dropping some firms as follows.

Firms, which were dropped, include unlisted firms, financial firms, firms without the required data, and firms with a year ending date other than March 2000. Also dropped were firms with non-positive PBDIT to ensure the dependent variable is always defined and positive. This procedure resulted in a sample of 1,412 firms, which is the basis for most of the empirical procedures. The sample includes 858 independent firms,

[17] The suitability of the Indian business houses structure to tests of business groups theories is consistent with Khanna and Palepu, (2000a).
[18] Thus the initial data set excludes firms from the Public Sector, the Foreign Sector, or any combination thereof.
[19] The choice of March as the year ending date is due to the fact that majority of Indian companies have a year ending date of March, which corresponds to the Indian tax year ending. It is also worth noting that, although as discussed in Sub Section 5.2.2 the assumption that group affiliation is stable over time may be reasonable in the case of India, also Khanna and Palepu (2000a) use a single year.

of which 533 did not pay dividend in the year 2000, and 554 group-affiliated firms, of which 232 did not pay dividend[20]. Table 2 presents the descriptive statistics for the sample.

[Table 2 about here]

Table 2 is divided into three Panels A to C. Panel A presents the mean, standard deviation minimum, maximum and coefficient of variation for the dependent and each of the independent variables. The coefficient of variation is the ratio of the standard deviation to the mean. A low value indicates that the variable in question does not vary much and might not exhibit any significance if used as an independent variable in the regression. However, as can be seen from Panel A of Table 2, the coefficient of variation is well over 5% for all the explanatory variables.

Panel B of Table 2 presents the correlation matrix. Excluding the growth variables, all the other explanatory variables bear the expected relationship with the payout ratio.[21] Correlation amongst the explanatory variables is generally low although the reputation variables, REPUT1 and REPUT2, measuring reputation in terms of log of assets and log of market capitalisation respectively, appear problematic. Specifically, the correlation between REPUT1 and REPUT2 is as high as 0.78. Similarly the correlation between FLOAT2, the inverse measure of liquidity, and both REPUT1 and REPUT2 are both above the absolute value of 0.60.

To assess the degree of multicollinearity in the sample, the variance inflation factors (VIF) for each of the explanatory variables is given in Panel C of Table 2.[22] As can be seen from the table, by dropping either REPUT1, REPUT2, or both, the VIF values reduce to below two. As both REPUT1 and REPUT2 measure reputation in terms of size, in the remaining empirical procedures, the former is excluded. Use of the variable REPUT1 is made later as the basis for the weights in the heteroskedastic Tobit.

[20] Appendix B presents further details on the sample selection procedure.
[21] Compare Table 2 with the predictions summarised in Table 1.
[22] We use the variance inflation factor (VIF) to assess the degree of multicollinearity present in the sample; the VIF is defined as: $VIF(?_j) = 1/(1-R^2_j)$, where R^2_j is the coefficient of determination from a regression of the explanatory variable, X_j, on a constant and the rest of the explanatory variables. The VIF represents the ratio of the actual variance of the estimated coefficient, $?_j$, to what it would have been in the absence of multicollinearity, where R^2_j is equal to zero. Hence the higher the VIF value, the higher is the degree of multicollinearity.

However, before turning to the multivariate analysis, the nature of the business groups represented in the sample, in terms of their size and level of diversification, is addressed. This facilitates the subsequent comparative analysis of the variable of interest, the payout ratio, across the various groups.

4.2 Group size and diversification measures

The conclusions from the review of selective literature on business groups (sub-section 2.2) suggest that the level of group diversification is important. In particular in the context of India, Khanna and Palepu (2000a) find a quadratic relationship between firm performance and the diversification level of the group with which the firm is affiliated. In the spirit of Khanna and Palepu (2000a) four measures of group size and diversification across industries are constructed. These measures are based on the entire Indian Private Sector group-affiliated firms including both quoted and unquoted firms and totalling 2,042 firms.[23] The comparative analysis of the variable of interest, the payout ratio, across these measures is then assessed.

The first group measurement is SIZE which measures the size of the group with which a firm is affiliated in terms of the number of firms in the group. The other three group measures are diversification measures including COUNT, FOCUS and HERFIND. These diversification measures are based on 13 industries and 41 sub-industries as classified by CMIE. COUNT measures diversification in terms of the number of industries represented in the group. FOCUS is an inverse measure of diversification, or a concentration measure. It is defined as the ratio of the group's sales from the industry with the highest sales to total group's sales. Similarly, HERFIND is also an inverse diversification measure or a concentration measure. It is based on the Herfindahl concentration value, defined as the ratio of the sum of the squares of each industry's sales, to the squared value of total group's sales. Appendix A gives more detailed definitions of each of the group size and diversification measures while Table 3 presents summary statistics for these four measures.

[Table 3 about here]

[23] Notes on sample constructions are given in Appendix B.

Table 3 is divided into three Panels and presents statistics on the group size and diversification measures. Panel A presents summary statistics for group-affiliated firms in the sample, while Panel B presents the correlation matrix. Just as a check, Panel C presents the group size and diversification values for the 858 independent firms. In the rest of the empirical procedures, the count of industries represented in the group, COUNT, is selected to represent the nature of the group with which a firm is affiliated. This is for the following reasons.

COUNT is the measure selected in Khanna and Palepu (2000a), and as can be seen from the correlation matrix of Panel B of Table 3, it is highly correlated with all the other measures. COUNT is also a superior measure of diversification compared with FOCUS and HERFIND because it is based on all member firms rather than only those with sales data and year ending March 2000. Further, the use of either FOCUS or HERFIND results in a loss of 48 group-affiliated firms due to lack of sufficient group sales data. With COUNT as a measure of firm diversification, the number of group affiliated firms in the sample is 554, and the next stage is a comparative analysis of the payout ratios across independent and group affiliated firms.

4.3 Comparative analysis of the payout ratios across groups

Based on the statistics of Table 3, two group affiliation dummies, DG and HD are precisely defined in Appendix A. DG is a group affiliation dummy that indicates affiliation with a diversified group, which is diversified over more than 4 industries. HD is a group affiliation dummy that indicates affiliation with a highly diversified group, which is diversified over more than 11 industries.[24] Table 4 presents the comparative analysis of the payout ratio across independent and group-affiliated firms at various levels of diversification. Panel A of Table 4 presents the mean and median payout values across the sub-samples of firms affiliated with the various groups. Panel B and Panel C

[24] The classification of groups into diversified and highly diversified is based partly on the descriptive statistics of Panel A, Table 3, and partly on the classification in Khanna and Palepu (2000a). The threshold of 4 industries after which the group is classified as diversified is consistent both with the median of COUNT (5) reported in Panel A, Table 3, and with the intermediate diversified category in Khanna and Palepu (2000a) of groups with between 5 and 7 industries. The threshold of 11 industries after which the group is classified as highly diversified is consistent with the 3rd quartile value (11) for the distribution of COUNT as reported in Panel A, Table 3. It is also similar to the categorisation in Khanna and Palepu (2000a) of groups with over 7 industries as most diversified groups.

of Table 4 present parametric and non-parametric tests of the difference in payout ratios across the sub samples.

[Table 4 about here]

Two important observations are noted when looking at Table 4. The first is that there appear to be a significant difference in the payout ratios of independent and group-affiliated firms. In particular, as can be seen from Panel A of Table 4, both the mean and the median payout ratios are higher for group-affiliated firms compared with independent firms. Further both the mean and median increase with the level of group-diversification. Panels B and C of Table 4 show these differences to be significant. This observation is consistent with the second hypothesis put forward at the end of sub-section 2.2. This is the hypothesis that group affiliation mitigates formal markets' imperfections thus creating a substantial difference between the dividend policies of independent and group-affiliated firms.

The second observation is that there is a high proportion of firms that did not pay any dividend during the year. Indeed the median payout ratio for the full sample is zero, which implies that about half of all firms did not pay dividend (as the payout ratio is never negative by construction). This is also evident from the sample description of Appendix B, where it is shown that over 62 percent of independent firms and nearly 42 percent of group-affiliated firms did not pay dividend. Further, because the overall median is zero, the median test of Table 4, Panel C is also a test for the association between group-affiliation and the decision of whether or not to pay dividends. The rejection of the test therefore also indicates that there is an association between this decision and whether or not the firm is group affiliated.

The implication of the observation, that high proportion of firms did not pay dividend during the year, is that the dividend decision may in practice consist of two separate decisions. The first decision being whether or not to pay dividend and, providing the decision was to pay, the second decision is regarding the payout level. Another implication of the observation that the probability of a zero payout is substantially greater than zero, is that the distribution that applies to the variable of

interest is a mixture of discrete and continuous distributions. The dependent variable, PAYOUT, should therefore be treated as a limited random variable.

In light of the above, the empirical procedure in the next Section will proceed as follows. In the first stage a binary choice model for the decision of whether or not to pay dividend will be considered. In the second and third stages dividend models that allow for a limited dependent variable will be tested. In all stages, however, the underlying model is the transaction cost dividend model as presented in Equations (1) and (2).

5. Econometric methodology and results

The empirical procedure is divided into three sub-sections. The first part consists of tests on the dividend decision using binary choice models, namely Probit and Logit models. The second and third parts address the payout level decision using limited dependent variable models. In the second sub-section the censored regression model, the Tobit model, is utilised while in the last sub-section a sample selection model is tested.

5.1 Binary choice models for the dividend decision

In the binary choice model the value of the dependent variable is limited to two values, 1 if the decision was to pay dividend and 0 if the decision was not to pay. Thus the dependent variable is the probability of the firm deciding to pay dividend conditional on the information set specified by the RHS variables. Panels A B and C of Table 5 present the results of the Probit estimations for the full sample, independent firms and group-affiliated firms respectively. The underlying model for the full sample of Panel A, Table 5 is that presented in Equation (2), which includes the group affiliation dummy and the interaction terms. For the independent and group-affiliated models of Panels B and C, Table 5, the underlying model is that presented in Equation (1). In all three cases, insignificant coefficients were dropped one by one to give the results presented.

[Table 5 about here]

A number of important points arise from Table 5. The probability of a dividend payment appears to be influenced by the variables suggested in the transaction cost model of Equation (1). Further, the direction of the relationship is, in general, consistent with the expectations of Table 1. For the full sample as well as for the independent and group-affiliated sub samples, the probability of a dividend payment increases with the level of free cash flow, FCF, and with ease of access to the capital market as represented by size (REPUT2) and by age (REPUT3). However, age appears to have a stronger affect for independent firms compared with group-affiliated firms. This is evident from the negative interaction term, (GP REPUT3), in the full sample of Panel A of Table 5. It is further apparent from the lower estimated coefficient on REPUT3 in the group-affiliated sample of Panel C (0.475) compared with that in the independent firms' sample of Panel B (0.626).

Similarly flotation costs enter all models with a negative estimated coefficients. The inverse liquidity measure, FLOAT2, drops out of the model fitted to the group-affiliation sample of Panel C, Table 5. However, the absolute value of the estimated coefficient on the volatility of returns variable, FLOAT1, is higher in the group affiliated model of Panel C compared with the independent firms model of Panel B.

The growth variable GROW2, which measures growth expectations in terms of R&D expenditure, enters the equation for the independent firms' sample of Panel B, Table 5, with large and negative estimated coefficient (-17.451). This is consistent with the predictions of Table 1. However, the past growth in sales measure, GROW1, enters all the models of Table 5 with positive estimated coefficients, which is contrary to expectations. Similarly, the price to earnings ratio, GROW3, has a positive affect on the probability that a group-affiliated firm will decide to pay dividend. This is apparent from the positive estimated coefficient on the interaction term, (GP GROW3), of Panel A, Table 5. It is also evident from the positive estimated coefficient on GROW3 in Panel C of Table 5. The positive impact of the rate of growth, GROW1 and GROW3, on the probability of a dividend payment is consistent with the prediction and findings in Redding (1997). Accordingly dividends signal unobservable financial strength by managers with superior information.

The estimated coefficients in column (2) of Panels A to C, Table 5, reflect the impact of changes in the explanatory variables on the probability of the decision to pay dividend. However, for the Probit model they are not quite the marginal effects. Instead, the marginal effects are given in column (6) of each of Panels A to C of Table 5.[25]

Column (7) of each of Panels A to C of Table 5 give the estimated coefficients obtained from the Logit model and adjusted so that they are comparable with the Probit estimated coefficients. The Probit model is appropriate when the error terms in the latent variable follow a normal distribution, while the Logit is the appropriate model when these errors follow a logistic distribution. In any case, as expected, once the Logit estimated coefficients are adjusted they give very similar results to the Probit model estimation. The full Logit models are therefore not reported, although the McFadden's R-squared for the corresponding Probit and Logit models are calculated and reported.[26]

To summarise the binary choice model estimations, it seems that the decision to pay dividend in the case of both independent and group-affiliated firms is greatly influenced by transaction cost considerations. There is also evidence to support the view that signalling considerations enter the dividend payment decisions of Indian firms. It appears that for both independent and group-affiliated firms, similar influences impact the probability of payment and there is no apparent distinction between the two types of firms. The next question is, therefore, whether any difference does exists with regards the decision of the dividend level between independent and group-affiliated firms.

5.2 Tobit analysis for the payout level decision

The transaction cost representation of equation (2) models the *desired* payout level as represented by the *actual* payout level. However, the actual payout ratio, PAYOUT, of Equation (2) is limited in its range to non-negative values while the desired payout level could take any value. Thus only part of the distribution of the desired payout level is

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[25] The marginal effect in the Probit model are calculated as: $dF(?'X)/dX = [dF(?'X)/d(?'X)] ? = f(?'X) ?$, where $f(?'X)$ is the density function that corresponds to the cumulative distribution $F(?'X)$. Thus, the probability derivatives, $f(?'X) ?$, will vary with the value of X, and for interpretation purposes the marginal effects are given by their means. In other words the density function, $f(?'X)$, is evaluated at every observation and the sample average is then used to compute the marginal effects. As the mean density function, [the average of $f(?'X)$] is a constant it is termed the scale factor.

[26] The MaFadden's R-squared is defined as 1 – (Log Lunrestricted / Log Lrestricted). The unrestricted log likelihood (Log Lunrestricted) is the log likelihood from the regression reported. The restricted log likelihood (Log Lrestricted) is the log likelihood when the restriction that all of the ? coefficients are zero, is imposed.

observed. The first stage is therefore to decide on the appropriate regression technique for this type of limited distribution. That is, to choose between a truncated regression model and a censored regression model.

The truncated regression is the appropriate model when the assumption is of a truncated distribution. This means that observations on the desired payout ratios are only available on part of the total distribution of desired payouts, which are (in this case) at or above the value of zero. In contrast the censored regression is the appropriate model when the assumption is that the desired payout level is observed when it is at or above the value of zero. When the desired payout level is below zero, the exact desired payout level is not observed and instead what is observed is an actual payout of zero.

Based on this difference between the truncated and censored regressions, the assumption in this study is of a censored distribution, which is justified as follows. If the underlying distribution of the desired payout level is assumed to be normal, there is no explanation for the observation of relatively high frequency of zero payouts.[27] This can only be explained by assuming that some of these zero actual payouts represent negative desired payout levels. This explanation is consistent with a censored distribution.

More formally, let PAYOUT* be the unobservable latent variable representing the desired payout ratio. The actual payout ratio, PAYOUT, which is observable, equals the latent variable, PAYOUT*, when the latter is greater than zero, and zero otherwise. This is the censored (Tobit) specification because some observations on the latent variable (typically when the desired payout ratio is non-positive) are not allowed in practice.

When the variable of interest is censored the Ordinary Least Squares (OLS) methodology is inappropriate because the error term is biased. The method used to estimate equation (2) is therefore the maximum likelihood Tobit model under the alternative assumptions of homoskedastic and heteroskedastic normal disturbances. The results, after dropping insignificant variables one by one from Equation (2), are given in Table 6.

[Table 6 about here]

[27] The relatively high frequency of actual zero payouts is evident from Appendix B, which gives details of the sample and the fraction of firms that did not pay dividends in the period studied. Also refer to the comparative analysis of the payout ratios across independent and group-affiliated firms.

The results presented in Table 6 require some clarification. For the heteroskedastic Tobit model, the nature of the heteroskedasticity is assumed to be of the form:

$$?^2_i = ?^2 (FIRM\ SIZE)_i^{?} \quad (3)$$

where FIRM SIZE is measured in terms of total assets. Taking the square root of both sides of (3), the equation can be expressed as:

$$?_i = ? (FIRM\ SIZE)_i^{?/2} = ? (FIRM\ SIZE)_i^{?} \quad (4)$$

The idea is to obtained starting values for $?$ and $?$ and to replace the constant sigma in the log likelihood function with the RHS of Equation (4). For this end the natural logs of the absolute residuals from the OLS regression are regressed on a constant and the natural log of FIRM SIZE.[28] From this auxiliary regression estimates of the natural log of $?$ and of $?$ are obtained and these form the starting values for the heteroskedastic Tobit.[29] The starting values for the rest of the coefficients in the heteroskedastic Tobit are obtained from the homoskedastic Tobit.

Table 6 reports the LR test results for heteroskedasticity. This test is based on the difference between the log likelihood from the homoskedastic Tobit (the restricted model) and the log likelihood from the heteroskedastic Tobit. The null is of homoskedasticity, which implies that $?$ in Equation (4) is insignificantly different from zero. As can be seen from Table 6, the null can be rejected at the 1 percent significant level. This implies that the heteroskedastic Tobit should be preferred, which is also reinforced by the lower Schwarz criterion reported in Table 6. Thus the following analysis is based on the results of the heteroskedastic Tobit.

According to the results in Table 6, the estimate of $?$ in equation (4) is 0.352 [exp(-1.044)], and the estimate of $?_i$ is given by $0.352\ (FIRM\ SIZE)_i^{-0.225}$. As in the Probit analysis the sign on the estimated coefficient of GROW1, the past growth measured in terms of sales, is positive. This positive sign, which is contrary to the prediction of Table 1, is interpreted also here in terms of dividend signalling theory.

[28] It is noted that the log of firm size, that is the log of total assets, is the variable REPUT1, described in Appendix B.

[29] Taking the natural logs from both sides of Equation (5.4): $LN(?_i) = LN[? (FIRM\ SIZE)_i^{?}] = LN? + ? LN(FIRM\ SIZE_i) = LN? + ? REPUT1_i$. Replacing $?_i$ by the absolute value of the residual from the OLS regression and running the regression on a constant and REPUT1, generates estimated coefficients for $LN?$ and for $?$. These provide the starting values for the heteroskedastic Tobit.

Also consistent with the results of the Probit analysis, free cash flow, FCF, and reputation, REPUT2 and REPUT3, are positively related to the payout level. Further, the flotation cost variables, FLOAT1 and FLAOT2, both enter the Tobit model with negative estimated coefficients. The growth expectation measures, GROW2, which represents R&D expenditure, and GROW4, which is the market to book ratio, are also shown to be negatively and significantly related to the payout level. All these signs match the predictions of Table 1, thus as hypothesised, dependency on external finance appears to be an important determinant of the dividend policy of firms. This is the case at least before the interaction terms are examined.

However, the Tobit analysis of Table 6 shows interesting results with regard group-affiliation. In particular, the estimated coefficients on all of the group-affiliation interaction terms are generally of the same magnitude but with the opposite sign of the estimated coefficients on the individual variables. This is supportive of the idea that while these explanatory variables are good in explaining the payout level in the case of independent firms, they do not enter the decision in the case of group-affiliated firms.

In particular, while the estimated coefficient on GROW2 is -1.948, that on the interaction term, (GP GROW2) is 2.689. For GROW4 the estimated coefficient is -0.003, while for the interaction term (GP GROW4) it is 0.002. For REPUT2 and REPUT3 the estimated coefficients are 0.027 and 0.057 respectively, while for the interaction terms (GP REPUT2) and (GP REPUT3) the estimates are -0.011 and -0.049 respectively. Even the constant, estimated at -0.181 is near enough cancelled by the group dummy variable, GP, estimated at 0.162. These results lend support to the idea that the group structure narrows the gap between the cost of external and internal finance thus making the payout level decision less sensitive to dependency on the former.

To summarise, a substantial difference between independent and group affiliated firms is evident from the Tobit analysis. While the payout level decision of independent firms appears to be sensitive to all the explanatory variables suggested in Equation (1), this is not the case for group-affiliated firms. Indeed, the payout level of group-affiliated firms appears insensitive to growth prospects, firm size and age, (GROW2, GROW4, REPUT2 and REPUT3). However, the dividend decision of group-affiliation firms still

appears to be positively influenced by free cash flows (FCF), and negatively influenced by volatility of returns and lack of liquidity (FLOAT1 and FLOAT2).[30]

Finally, also worth noting is the signalling function of dividend as represented by the significant and positive estimated coefficient on the growth variable, GROW1. To investigate the matter further, the next sub-section generalises the Tobit model to allow for selectivity bias. This is the Sample Selection model.

5.3 The Sample Selection model for the payout level decision

The results from the Probit analysis show that firms follow a decision process that results in them either paying or not paying dividend, so that there is self-selection by the firms being investigated. This implies that the observability of the desired payout ratios is non-random but is determined by factors that may be correlated with it.[31] Specifically, the desired payout ratio is observed only for firms for which the explanatory and unobserved variables in the binary choice model satisfy the threshold level. However, as shown in the previous sub-section, the payout level of independent and to lesser extent group-affiliated firms is also determined by the same explanatory variables and possibly by the same unobserved characteristics. Thus there is correlation between the disturbance terms of the binary choice and payout level models, and this correlation is measured by *rho (?)*.

When ? is non-zero, estimation of the payout level equation in the selected sample where the desired payout ratio is observed would result in biased coefficients. The sample selection model connects the binary choice and payout level models by estimating the correlation between their disturbances, ?. Thus in the sample selection model the binary choice model is referred to as the selection equation while the payout level model is termed the regression equation. The sample selection procedure also

[30] The opposite signs on the interaction terms of the group-affiliation dummy and the variables representing growth expectations (GP GROW2, GP GROW4), and ease of access to the capital market (GP REPUT2, GP REPUT3) have been predicted in Section 3. The impact of the interaction term between the group-affiliation dummy and the free cash flow (GP FCF) was not predicted in Section 3. Thus the fact that this interaction term proved to be unimportant is not inconsistent with predictions. Group-affiliated firms were also predicted in Section 3 to be insensitive to flotation cost but this is not supported by the Tobit results of Table 6. However, as noted in footnote 15, the prediction of insensitivity of group-affiliation firms to flotation cost is based on two assumptions. These include the assumption that group-affiliated firms will opt for non-underwritten direct offering, and the assumption that these firms may enjoy lower flotation fees to government agencies through preferential access. Thus the fact that the interaction terms between the group-affiliation dummy and the flotation cost variables drop out of the Tobit model casts doubt on the validity of these assumptions.

[31] The sample may also be non-random due to the decision to exclude firms with non-positive profit. However, as explained in Section 3, to reduce this selection bias, profit is defined before depreciation, interest and tax.

estimates sigma, ?, the standard deviation of the regression equation.[32] Table 7 presents the results of the sample selection estimation for the sub sample of independent firms and for the sub sample of firms affiliated with diversified groups. The selection and regression equations that enter the sample selection model are both based on the transaction cost specification of Equation (1). Insignificant explanatory variables are dropped one by one to give the tested down versions presented in Table 7.[33]

[Table 7 about here]

As can be seen from the LHS of Table 7, the results for the sub sample of independent firms are consistent with the Probit, the Tobit and the first hypothesis of this study, namely the applicability of the transaction cost model of dividend to firms in India. Indeed, all the explanatory variables in the transaction cost model of Equation (1) enter both the selection and regression equations with the predicted signs. Further, the null hypothesis of homoskedasticity is not rejected, and selectivity bias appears to be present as represented by the estimated value of ?. The logical next step is to apply the sample selection model to the sub-sample of group-affiliated firms.

The results from the application of the sample selection model to the sub sample of group-affiliated firms, however, are not because the sample selection model does not fit well to this sub sample firms. For example, the heteroskedasticity test rejects the null of homoskedasticity. Further, the estimated correlation between the disturbances of the selection and regression equations, ?, is given as 1, indicating that the selection equation is dominating the model. Indeed the tested down sample selection model for the group-affiliated firms includes 10 explanatory variables for the selection equation but only 3 for the regression equation.[34]

[32] The variance (and hence ?) from the selection equation is assumed to equal unity because only the sign of the latent variable is observed. The dependent is 1 if the decision is to pay dividend and 0 if the decision is not to pay.

[33] Although not reported, the sample selection model was also run on the sub sample of all 554 group-affiliated firms. Both the selection and regression equation in this case are given in Equation (1) with the addition of the two dummy variables for diversified groups (DG) and highly diversified groups (HD). As explained in the next footnote, both DG and HD drop out of the regression equation but remain in the selection equation.

[34] The variables that enter the selection equation include the following ten variables: the constant; the growth variables (GROW1, GROW3 and GROW4); the reputation variables (REPUT2 and REPUT3); the floatation cost variable (FLOAT1); the free cash flow variable (FCF); and the two group diversification dummies (DG and HD). The variables that enter the regression equation include the following three variables: the reputation variable (REPUT2); the floatation cost variable (FLOAT1); and the free cash flow variable (FCF).

If more variables are added to the regression equation, this may improve the fit of the sample selection model to the sub sample of group-affiliated firms. However, consistent with the Tobit results and with the hypothesis put forward transaction cost considerations are generally not important determinants of the payout ratios of group-affiliated firms. A search for other explanatory variables, that may explain the payout behaviour of group-affiliated firms, is required but this is left for another paper.

The RHS of Table 7 presents the results of fitting the sample selection model to the sub sample of firms affiliated with diversified groups. The LR test for the null hypothesis of homoskedasticity is rejected at the 10 percent significant level but not at the 5 percent level. The decision of firms affiliated with diversified groups of whether to pay dividend appears to be influenced positively by reputation and the availability of free cash and negatively by flotation cost. Further, the payout level decision of these firms appears to be influenced by all the explanatory variables in the transaction cost model of Equation (1). Indeed, the direction of influence is as predicted in Table 1.

The apparent good fit of the sample selection model to the sub sample of firms affiliated with diversified groups is puzzling. As discussed in the review of selective literature on business groups (sub-section 2.2) the results in a number of studies emphasise the importance of group-diversification in determining the value of group affiliation. Most relevant is the Khanna and Palepu (2000a) study, which concludes that group-affiliation initially has an adverse affect on firm's performance, until a certain threshold of group diversification level is achieved. If the value of the group is positively related to its diversification level, than the dividend decisions of firms affiliated with diversified groups should display less sensitivity to transaction cost considerations.

To summarise, implications of the results of the sample selection model are mixed. The results with respects to the sub samples of independent and group-affiliated firms appear consistent with expectations and with earlier models. However, the results for the sub sample of firms affiliated with diversified groups are puzzling. The conclusions from this and the rest of the study are summarised next.

6. Summary and concluding remarks

This study begins with a brief review of two strands of the corporate finance literature. The first strand focuses on the dividend policy puzzle and the theory of dividend, which seeks to explain the dividend decision of firms. The emphasis here is on the transaction cost theory of dividend, which explains the dividend decision in terms of pecking order and the gap between internal and external finance. The idea put forward is that dependency on external finance and the transaction cost model of dividend should fit particularly well to data from an emerging market.

The second strand relates to business groups and theories regarding their role, particularly in the context of emerging markets. A main school of thought here is the market failure theory pioneered by Leff (1976), which asserts that the role of business groups is to mitigate market imperfections. Another school of thought, which according to Ghemawat and Khanna (1998) appears to suit particularly well the Indian case, is the political economy theory of business groups. Based on these two business group theories it is hypothesised that the dividend decision of group-affiliated firms should display much less sensitivity to transaction cost considerations compared with non-affiliated firms. Instead the payout decision of group-affiliated firms is expected to be influenced by the preferences of the controlling entity and by group-wide considerations. Table 8 summarises the main conclusions from the empirical procedures.

[Table 8 about here]

As can be seen from Table 8, the comparative analysis points to a significant difference in the payout behaviour of independent and group-affiliated firms. Further, there appear to be a direct relationship between the level of diversification of the group and its payout decision. However, although the payout median test suggests that there is an association between the decision to pay dividend and whether the firm is group-affiliated, this is not supported in the binary choice models. Indeed, conclusions from the Probit analysis are that the decision to pay dividend in the case of both independent and group-affiliated firms is influenced by transaction cost considerations.

The conclusions from the regression models of the payout level decision are different to those from the binary choice models. In particular, the Tobit regression points to clear differences in the dividend behaviour of independent and group-affiliated firms. While the payout ratios of independent firms tend to decrease with growth prospects and increase with ease of access to the capital market, the payout ratios of group-affiliated firms appear insensitive to these factors. However, the payout ratios of all firms tend to decrease with flotation cost and increase with the availability of surplus cash. Similar conclusions also emerge from the sample selection model, although there the payout ratios of group-affiliated firms appear to increase with ease of access to the capital market as represented by firm size (REPUT2).

Overall, the study finds support for the hypothesis that group-affiliated firms enjoy smaller gap between the cost of external and internal finance and therefore their payout ratios are less responsive to dependency on the former. One puzzling result is the apparent good fit of the sample selection model to the sub sample of firms affiliated with diversified groups. Thus the question of why the payout ratios of firms affiliated with diversified groups appear sensitive to transaction cost considerations is left unanswered. Another issue, which is left unanswered, is how the dividend decisions of group-affiliated firms should be modelled. These two issues are yet to be explored.

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Table 1: The predicted association between the payout ratio and the explanatory variables

Name	Description	Predicted sign
GROW1	Past growth. Average annual growth in sales over past 5 years.	(-)
GROW2	Growth expectations. Ratio of R&D expenditure to sales.	(-)
GROW3	Growth expectations. Price to earnings ratio.	(-)
GROW4	Growth expectations. Market to book ratio.	(-)
REPUT1	Firm size. Log of total assets.	(+)
REPUT2	Firm size. Log of market capitalisation.	(+)
REPUT3	Firm age. Log of number of years since incorporation.	(+)
FLOAT1	Standard deviation of the stock's daily returns over the year.	(-)
FLOAT2	1 - the ratio of relative trading days of the stock on the stock exchange	(-)
FCF	Free cash flow after paying for future investments but before dividends	(+)

Note:
Variable definitions are given in Appendix A.

Table 2: Panel A - Summary statistics for the dependent and independent variables for the year ending March 2000
(Number of observations is 1412. Variable definitions are given in Appendix A)

Variable	Mean	Standard Deviation	Minimum	Maximum	Coefficient of Variation
PAYOUT	0.0594	0.0929	0.000	0.831	1.565
GROW1	0.208	0.407	-0.750	4.185	1.958
GROW2	0.00184	0.00732	0.000	0.138	3.972
GROW3	10.303	65.818	-709.780	1440.000	6.388
GROW4	1.516	8.498	-32.280	237.850	5.606
REPUT1	4.071	1.579	-0.357	10.288	0.388
REPUT2	2.427	1.987	-2.813	11.743	0.819
REPUT3	3.021	0.620	1.792	4.890	0.205
FLOAT1	0.146	0.467	0.000	15.948	3.204
FLOAT2	0.402	0.356	0.000	1.000	0.886
FCF	0.0373	0.0714	-0.700	0.757	1.911

Table 2: Panel B - Correlation matrix

	PAYOUT	GROW1	GROW2	GROW3	GROW4
PAYOUT	1.000				
GROW1	0.0243	1.000			
GROW2	0.0352	-0.0130	1.00		
GROW3	0.0293	0.0153	0.0683	1.00	
GROW4	0.0452	0.0732	0.0466	0.371	1.000
REPUT1	0.142	-0.0213	0.129	0.00144	0.111
REPUT2	0.332	0.0748	0.175	0.169	0.320
REPUT3	0.147	-0.320	0.0783	-0.0224	-0.00401
FLOAT1	-0.117	0.0239	-0.0401	-0.154	-0.0137
FLOAT2	-0.237	-0.0127	-0.165	-0.0329	-0.0858
FCF	0.295	0.0593	0.0415	0.0987	0.164
	REPUT1	**REPUT2**	**REPUT3**	**FLOAT1**	**FLOAT2**
REPUT1	1.000				
REPUT2	0.783	1.000			
REPUT3	0.374	0.237	1.00		
FLOAT1	-0.107	-0.0918	-0.0851	1.00	
FLOAT2	-0.605	-0.601	-0.124	0.171	1.000
FCF	0.0413	0.254	0.0262	-0.0502	-0.171

Table 2: Panel C - Variance Inflation Factors (VIF) for the explanatory variables

Note	GROW 1	GROW 2	GROW 3	GROW 4	REPUT 1	REPUT 2	REPUT 3	FLOAT 1	FLOAT 2	FCF
(a)	1.150	1.045	1.227	1.315	3.574	3.704	1.352	1.066	1.801	1.168
(b)	1.138	1.037	1.201	1.209	1.898		1.350	1.063	1.721	1.072
(c)	1.072	1.072	1.072	1.295		1.967	1.227	1.066	1.658	1.082
(d)	1.082	1.036	1.036	1.196			1.145	1.063	1.103	1.103

Note:
(a) Auxiliary regressions include all the explanatory variables; (b) Auxiliary regressions exclude REPUT2; (c) Auxiliary regressions exclude REPUT1; (d) Auxiliary regressions exclude REPUT1 and REPUT2.

Table 3: Panel A - Summary statistics for group size and diversification measures for the sample of group-affiliated firms
(Missing values for series: FOCUS: 48, HERFIND: 48 Number of observations: 554 – 48 = 506)

	Mean	Std. Dev	Min	Max	Median	1st Qrt	3rd Qrt	IQ range
SIZE	22.445	32.339	2.000	110.000	8.000	4.000	20.000	16.000
COUNT	8.142	7.296	1.000	24.000	5.000	3.000	11.000	8.000
FOCUS	0.669	0.254	0.227	1.000	0.691	0.463	0.931	0.468
HERFIND	0.574	0.288	0.131	1.000	0.532	0.355	0.871	0.516

Table 3: Panel B - Correlation Matrix between the group size and diversification measures for 506 group-affiliated firms

	SIZE	COUNT	FOCUS	HERFIND
SIZE	1.000			
COUNT	0.935	1.00		
FOCUS	-0.702	-0.786	1.000	
HERFIND	-0.674	-0.780	0.983	1.00

Table 3: Panel C - Descriptive statistics for group size and diversification measures
(Values for non-group affiliated firms; number of observations: 858)

	Mean	Std Dev	Minimum	Maximum
SIZE	1.000	0.000	1.000	1.000
COUNT	1.000	0.000	1.000	1.000
FOCUS	1.000	0.000	1.000	1.000
HERFIND	1.000	0.000	1.000	1.000

Note:
SIZE = Group size, measured in terms of the number of firms in the group.
COUNT = Group diversification, measured in terms of the number of industries represented in the group.
FOCUS = Group diversification, measured as the ratio of the sales generated from the industry with the highest sales to total group's sales.
HERFIND = Group diversification, measured as the ratio of the sum of squares of each industry's sales to the squared value of total group's sales.

Table 4: Panel A - Comparative analysis of the payout ratio across group-affiliation categories

	Full sample	Non-affiliated	Group-affiliated		
			All	Diversified (COUNT>4)	Highly diversified (COUNT>11)
Observations	1412	858	554	273	116
Mean	0.0594	0.0520	0.0707	0.0783	0.0934
Median	0.000	0.000	0.0447	0.0547	0.0828
Std. Dev.	0.0929	0.0892	0.0973	0.0951	0.0926
Variance	0.00863	0.00796	0.00946	0.00905	0.00857

Note:

COUNT = Group diversification, measured in terms of the number of industries represented in the group.

Table 4: Panel B - Tests for the difference in payout ratios between non-group affiliated firms and group-affiliated firms
(Tests which assume that the samples have been drawn from a normal population)

	Non-affiliated firms (858 observations) versus firms affiliated with:		
	All groups [554 firms]	**Diversified** [273 firms]	**Highly diversified** [116 firms]
H_0: $?^2_1=?^2_2=?^2$ H_1: $?^2_1 ? ?^2_2$	F (553,857)=1.188804** Upper tail area .01193	F (272,857)=1.137151 Upper tail area .09069	F (115,857)=1.076326 Upper tail area .28639
Assume: $?^2_1=?^2_2$ H_0: $?_1=?_2$ H_1: $?_1 ? ?_2$	t (1410)=3.708863*** Two-tailed area .00022	t (1129)=4.162722*** Two-tailed area .00003	t (972)=4.663449*** Two-tailed area .00000
Assume: $?^2_1 ? ?^2_2$ H_0: $?_1=?_2$ H_1: $?_1 ? ?_2$	t (1108)=3.640564*** Two-tailed area .00028	t (436)=4.026642*** Two-tailed area .00007	t (146)=4.534498*** Two-tailed area .00001

Note:

Significance levels based on two tail tests: **-significant at 5% level, ***-significant at 1% level. Degrees of freedom are given in parentheses. The subscript 1 denotes the group-affiliated sample while the subscript 2 denotes the non-group affiliated sample.

Table 4: Panel C - Non-parametric tests for the difference in payout ratios between non-group affiliated firms and group-affiliated firms

	Non-affiliated firms (858 observations) versus firms affiliated with:		
	All groups [554 observations[	**Diversified groups** (COUNT>4) **[273 observations]**	**Highly diversified** (COUNT>11) **[116 observations]**
Median test	$?^2$ = 55.57***	$?^2$ =48.60***	$?^2$ =40.65***
Mann-Whitney	Standardised U=-5.5970***	Standardised U=-5.6275***	Standardised U=-5.5695***

Note:

*** denotes significant at 1% level

Median test: Critical value for $?^2_{(1)}$ with upper tail area of 1% is 6.63. Therefore in all cases can reject the null of no association between group-affiliation and payout ratios in favour of some association.

Mann-Whitney U test: The rank sum is calculated for the group-affiliated sample. Critical value for Z with two tailed area of 1% is |2.575829|. Therefore in all cases can reject the null of no difference in the payout ratios of group-affiliated and non group-affiliated firms at the 1% significance level in favour of the alternative of a difference.

Table 5: Panel A - Probit analysis of dividend decision for the full sample

Probit Estimation: **All firms** R-squared = 0.421031
Dependent variable: PAYOUT Scaled R-squared = 0.457705
Number of observations = 1412 McFadden's R-squared = 0.35832 [For Logit = 0.36082]
Number of positive obs. = 647 Schwarz B.I.C. = 664.751
Mean of dep. var. =0 .458215 Log likelihood = -624.861
Sum of squared residuals = 202.989 LR (zero slopes) = 697.852 [.000]
Fraction of Correct Predictions = 0.790368 LR (omitted variables, $?^2_9$)[a] = 5.921508 [.74775]

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parameter	**Probit Estimate**	**Standard Error**	**t-statistic**	**P-value**	**Standardised coefficients** (marginal effects)	**Scaled Logit estimates** (multiplied by 0.625)
C	-2.279	0.285	-8.006	[.000]	-0.571	-2.414
GROW1	0.399	0.114	3.497	[.000]	0.100	0.438
GROW2	-13.321	6.498	-2.050	[.040]	-3.338	-14.905
REPUT2	0.313	0.035	8.945	[.000]	0.078	0.331
REPUT3	0.643	0.083	7.714	[.000]	0.161	0.688
FLOAT1	-4.175	0.588	-7.095	[.000]	-1.046	-4.734
FLOAT2	-0.411	0.140	-2.935	[.003]	-0.103	-0.466
FCF	3.593	0.656	5.476	[.000]	0.900	4.430
GP GROW1	0.750	0.312	2.403	[.016]	0.188	0.887
GP GROW3	0.008	0.003	3.045	[.002]	0.002	0.009
GP REPUT3	-0.141	0.033	-4.320	[.000]	-0.035	-0.158

Note:
Standard errors are computed from analytic second derivatives (Newton). In TSP4.5 this is the default method of calculating standard errors for PROBIT and LOGIT models.
The omitted variables include: GROW3, GROW4, GP, and the interaction terms: (GP GROW2), (GP GROW3), (GP REPUT2), (GP FLOAT1), (GP FLOAT2), (GP FCF).

Table 5: Panel B - Probit analysis of dividend decision for non group-affiliated firms

Probit estimation: **Independent firms** R-squared = 0.398278
Dependent variable: PAYOUT Scaled R-squared = 0.429300
Number of observations = 858 McFadden's R-squared = 0.34472 [For Logit = 0.34765]
Number of positive obs. = 325 Schwarz B.I.C. = 400.038
Mean of dep. Var. = 0.378788 Log likelihood = -373.020
Sum of squared residuals = 121.502 LR (zero slopes) = 392.471 [.000]
Fraction of Correct Predictions = 0.780886 LR (omitted variables, $?^2_2$)[a] = 2.248916 [.32483]

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parameter	**Probit Estimate**	**Standard Error**	**t-statistic**	**P-value**	**Standardised coefficients** (marginal effects)	**Scaled Logit estimates** (multiplied by 0.625)
C	-2.264	0.359	-6.312	[.000]	-0.557	-2.421
GROW1	0.379	0.118	3.223	[.001]	0.093	0.418
GROW2	-17.451	8.422	-2.072	[.038]	-4.289	-19.444
REPUT2	0.316	0.048	6.643	[.000]	0.078	0.333
REPUT3	0.626	0.101	6.184	[.000]	0.154	0.667
FLOAT1	-3.760	0.675	-5.573	[.000]	-0.924	-4.156
FLOAT2	-0.449	0.169	-2.657	[.008]	-0.110	-0.493
FCF	4.078	0.930	4.383	[.000]	1.002	5.498

Note:
Standard Errors computed from analytic second derivatives (Newton). In TSP4.5 this is the default method of calculating standard errors for PROBIT, and LOGIT. The omitted variables include: GROW3 and GROW4.

Table 5: Panel C - Probit analysis of dividend decision for group-affiliated firms

Probit estimation: **Group affiliated firms** R-squared = 0.400889
Dependent variable: PAYOUT Scaled R-squared = 0. .424851
Number of observations = 554 McFadden's R-squared = 0.33421 [For Logit = 0.33789]
Number of positive obs. = 322 Schwarz B.I.C. = 272.889
Mean of dep. var. = 0.581227 Log likelihood = -250.778
Sum of squared residuals = 80.8296 LR (zero slopes) = 251.764 [.000]
Fraction of Correct Predictions = 0.801444 LR (omitted variables, $?^2_3$)[a] =1.546920 [.67148]

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parameter	**Probit Estimate**	**Standard Error**	**t-statistic**	**P-value**	**Standardised coefficients** (marginal effects)	**Scaled Logit estimates** (multiplied by 0.625)
C	-2.250	0.474	-4.752	[.000]	-0.579	-2.302
GROW1	1.096	0.329	3.329	[.001]	0.282	1.263
GROW3	0.008	0.003	2.970	[.003]	0.002	0.009
REPUT2	0.326	0.047	6.975	[.000]	0.084	0.345
REPUT3	0.475	0.121	3.913	[.000]	0.122	0.493
FLOAT1	-5.427	1.173	-4.627	[.000]	-1.395	-6.736
FCF	3.112	0.957	3.253	[.001]	0.800	3.418

Note:
Standard Errors computed from analytic second derivatives (Newton). In TSP4.5 this is the default method of calculating standard errors for PROBIT, and LOGIT.
The omitted variables include: GROW2, GROW4 and FLOAT2.

Table 6: Tobit analysis of the payout level decision for the full sample

Dependent variable: PAYOUT — Number of positive obs. = 647
Number of observations = 1412 — Fraction of positive obs. = 0.458215
LR test for heteroskedasticity ($?^2_1$) = 191.7288, Upper tail area: .00000
LR test for omitted variables in the heteroskedastic Tobit ($?^2_6$)[a] = 3.668022, Upper tail area: .72150

	Homoskedastic Tobit			Heteroskedastic Tobit		
Parameter	**Estimate**	**t-statistic**	**P-value**	**Estimate**	**t-statistic**	**P-value**
C	-0.146	-3.768	[.000]	-0.181	-4.547	[.000]
GROW1	0.029	2.366	[.018]	0.024	1.879	[.060]
GROW2	-2.039	-2.132	[.033]	-1.948	-2.278	[.023]
GROW4	-0.003	-2.932	[.003]	-0.003	-4.683	[.000]
REPUT2	0.021	4.397	[.000]	0.027	6.173	[.000]
REPUT3	0.052	4.633	[.000]	0.057	4.979	[.000]
FLOAT1	-0.690	-9.259	[.000]	-0.780	-9.782	[.000]
FLOAT2	-0.043	-2.622	[.009]	-0.040	-2.514	[.012]
FCF	0.518	8.010	[.000]	0.424	7.129	[.000]
GP	0.074	1.427	[.154]	0.162	3.639	[.000]
GP GROW2	1.986	1.267	[.205]	2.689	2.289	[.022]
GP GROW4	0.002	1.805	[.071]	0.002	3.285	[.001]
GP REPUT2	-0.001	-0.189	[.850]	-0.011	-2.406	[.016]
GP REPUT3	-0.033	-2.141	[.032]	-0.049	-3.672	[.000]
SIGMA	0.140	33.048	[.000]			
LN (?)				-1.044	-12.985	[.000]
?				-0.225	-14.194	[.000]
Schwarz B.I.C.	41.1449			-47.4668		
Log likelihood	9.62446			105.489		

Note:
Standard Errors computed from analytic second derivatives (Newton). In TSP4.5 this is the default method of calculating standard errors for TOBIT.
Omitted variable include: GROW3 and the interaction terms: (GP GROW1), (GP GROW3), (GP FLOAT1), (GP FLOAT2) and (GP FCF)

Table 7: Sample Selection Estimation
(Probit Dependent variable: PAYOUT; Regression Dependent variable: PAYOUT)

Non Groups				**Diversified Groups**			
Convergence achieved after 5 iterations				convergence achieved after 5 iterations			
Number of observations = 858				Number of observations = 273			
Number of positive obs. = 325				Number of positive obs. = 169			
Fraction of positive obs. = 0.378788				Fraction of positive obs. = 0.619048			
Schwarz B.I.C. = 85.1252				Schwarz B.I.C. = -42.8173			
Log likelihood = -31.0883				Log likelihood = 76.4741			
LR test for omitted variables ($?^2_5$) = 5.992711				LR test for omitted variables ($?^2_9$) = 3.408465			
Upper tail area: .30693				Upper tail area: .94588			
LR test for heteroskedasticity ($?^2_{54}$) = 61.42171				LR test for heteroskedasticity ($?^2_{54}$) = 72.97816			
Upper tail area: .22743				Upper tail area: .04362			
Parameter	**Estimate**	**t-statistic**	**P-value**	**Parameter**	**Estimate**	**t-statistic**	**P-value**
Selection equation parameters:				Selection equation parameters:			
C	-1.595	-4.821	[.000]	**C**	-1.754	-3.555	[.000]
GROW1	0.284	2.929	[.003]				
GROW2	-11.325	-2.589	[.010]				
REPUT2	0.186	4.414	[.000]	**REPUT2**	0.213	3.727	[.000]
REPUT3	0.501	5.395	[.000]	**REPUT3**	0.429	3.951	[.000]
FLOAT1	-4.231	-6.639	[.000]	**FLOAT1**	-6.576	-3.425	[.001]
FLOAT2	-0.408	-2.691	[.007]				
FCF	2.901	3.815	[.000]	**FCF**	6.672	3.985	[.000]
Regression equation parameters:				Regression equation parameters:			
C	-0.033	-0.838	[.402]	**C**	0.047	1.811	[.070]
				GROW1	-0.098	-1.792	[.073]
GROW4	-0.002	-2.406	[.016]	**GROW4**	0.003	2.861	[.004]
REPUT2	0.012	2.541	[.011]	**REPUT2**	0.011	2.465	[.014]
REPUT3	0.025	2.266	[.023]				
FLOAT1	-0.494	-5.324	[.000]	**FLOAT1**	-0.872	-4.280	[.000]
FLOAT2	-0.034	-1.733	[.083]				
FCF	0.499	6.382	[.000]	**FCF**	0.872	5.541	[.000]
$?_{\text{(regression equation)}}$ & $?_{\text{(disturbances of selection \& regression equations)}}$				$?_{\text{(regression equation)}}$ & $?_{\text{(disturbances of selection \& regression equations)}}$			
SIGMA	0.127	20.079	[.000]	**SIGMA**	0.104	16.828	[.000]
RHO	0.981	99.563	[.000]	**RHO**	0.981	99.849	[.000]

Note:
Standard Errors computed from analytic second derivatives (Newton). In TSP4.5 this is the default method of calculating standard errors for SAMPSEL (Sample Selection command).

Table 8: Summary conclusions from the empirical procedures

Test	Conclusions
Comparative analysis for difference in average payout ratios across group affiliations.	1. Both the mean and the median payout ratios are higher for group-affiliated firms compared with independent firms. 2. Both the mean and median payout ratios increase with the level of group-diversification as measured by, COUNT, the number of industries represented in the group.
Binary choice (Probit/Logit) models of the dividend payment decision. Model applied to full sample and to sub samples of independent and group-affiliated firms.	The decision to pay dividend in the case of both independent and group-affiliated firms is influenced by transaction cost considerations. The probability of a dividend payment: 1. Decreases with growth expectations, GROW2 (R&D expenditure) 2. Increases with ease of access to the capital market as represented by size, REPUT2, and by age, REPUT3. 3. Decreases with flotation costs, FLOAT1 and FLOAT2. 4. Increases with the level of free cash flow, FCF. There is also evidence in support of signalling theory. The probability of a dividend payment increases with growth in sales measure, GROW1, and in the case of group-affiliated firms, also with the price to earnings ratio, GROW3.
Heteroskedastic Tobit model for the payout level decision. (The nature of heteroskedasticity is assumed to be a function of firm size as measured in terms of assets). Model applied to the full sample with interaction terms.	For independent firms dependency on external finance appears to be an important determinant of the payout level. The payout ratio: 1. Decreases with growth expectation measures, GROW2 (R&D expenditure), and GROW4, (market to book ratio) 2. Increases with reputation, REPUT2 (size in market value) and REPUT3 (age). 3. Decreases with flotation cost variables, FLOAT1 and FLAOT2. 4. Increases with free cash flow, FCF. For group-affiliated firms the estimated coefficients on the group-affiliation interaction terms cancel the effects of: 1. The growth variables, GROW2 and GROW4. 2. The reputation variables REPUT2 and REPUT3 However, the decision does seem to be influenced by free cash flows, volatility of returns and liquidity (FCF, FLOAT1 and FLOAT2) in the predicted direction. For all firms there is evidence in support of signalling theory as the payout ratio increases with the growth in sales measure, GROW1.
Sample selection model of the payout level decision with self-selection. Model applied to full sample and to sub samples of independent firms, group-affiliated firms, and firms affiliated with diversified groups	1. For independent firms there is evident of selectivity with all the explanatory variables entering both the regression equation and the selection equation with the expected signs. (GROW1 enters the selection equation with a positive sign) 2. For group-affiliated firms the selection equation appears to dominate the regression equation (the estimate of *?*, is 1). 3. For firms affiliated with diversified groups there is evident of selectivity with all but the growth variables represented in the selection equation with the predicted signs. All variables are also represented in the regression equation with the predicted signs apart from GROW4, which enters with a positive sign. The good fitness of the sample selection model to the sample of firms affiliated with diversified firms is puzzling. According to the hypothesis of Section 3, the expectation is that firms affiliated with diversified groups are less sensitive to transaction cost considerations. Hence proxies for these considerations are not expected to be good at explaining the payout ratio of these firms.

Appendix A: Variable Definitions

PAYOUT – A measure of dividend policy. It is calculated as: (Dividends) / (Profit Before Depreciation, Interest and Tax, PBDIT).

GROW – A measure of the rate of expansion. Alternative measures include:

- **GROW1** – A historic measures of growth. Defined as the average annual growth in sales over the previous five-year period. GROW1 = $(Sales_{2000} / Sales_{1995})^{1/5} - 1$
- **GROW2** – Measures growth expectations as the ratio of R&D expense to sales.
- **GROW3** – Measures growth expectations as the price to earnings (PE) ratio; hence, GROW3 = (Closing Price) / (Earnings Per Share, EPS).
- **GROW4** – Measures growth expectations as the market to book ratio, which is defined as closing price to book value per share. Book value per share is book equity divided by the number of outstanding equity shares.

REPUT – A measure of the ease of access to the capital market achieved through reputation. Alternative measures include the following:

- **REPUT1** – The size of the firm, measured as the log of the book value of total assets.
- **REPUT2** – The size of the firm, measured as the log of the market capitalisation.
- **REPUT3** – The age of the firm measured as log of the number of years since incorporation.

FLOAT – The flotation cost faced by a firm when raising capital in the capital market. We construct two alternative proxies:

- **FLOAT1** - Flotation costs as measured by the standard deviation of the stock's daily rate of return over the year. In line with Crutchley and Hansen (1989) firms with larger standard deviation of returns are assumed to pay higher flotation cost due to higher underwriting risk premiums. The rate of return on day t is defined as: $r_t = (p_t + g) / p_{t-1}$, where p_t is the closing price on day t, and g is the gains arising out of dividends or a bonus issue or a rights issue.
- **FLOAT2** – A proxy for flotation costs which is based on the relative trading days during the year ending 31 March 2000. Measured as 1 minus the ratio of the days the company's stock traded on the Bombay Stock Exchange (BSE) to the number of days that trading took place on the BSE in the period.

FCF – The Free Cash Flow is the net cash flow available for dividends after paying for future investment. FCF = (Closing cash balance + Cash outflow on account of dividend paid) / Total assets

GROUP AFFILIATION DUMMIES – The following three measures are used to capture the nature of the business group with which a firm is affiliated. Most of the empirical analysis is based on the first measure, while the second and third measures were constructed based on group diversification measures as detailed below:

- **GP** – Group affiliation dummy that is set to one if the firm is a member of a business group and zero otherwise. The classification of firms into groups is based on the classification system of the Centre for Monitoring the

Indian Economy (CMIE). The CMIE classification system is based on a continuous monitoring of the company's announcements and on qualitative understanding Indian business environment. A list of the names of all the Private Indian Business Houses (business groups) and their types is obtainable from the authors.

DG – Group affiliation dummy that indicates affiliation with a diversified group. A diversified group is defined as a group with above sample median diversification value. The diversification measure is the number of product lines represented in the group, COUNT. DG is set to 1 when the firm is affiliated with a group that is diversified over more than 4 product lines and 0 otherwise.

HD - Group affiliation dummy that indicates affiliation with a highly diversified group. A highly diversified group is defined as a group that falls in the 4th quartile of the sample diversification distribution. The diversification measure is the number of product lines represented in the group, COUNT. HD is set to 1 when the firm is affiliated with a group that is diversified over more than 11 product lines and 0 otherwise.

GROUP SIZE AND DIVERSIFICATION MEASURES - The following variables measure the size and diversification levels of the group with which a firm is associated. For non-affiliated firm each of the four following measures is set to unity. While the first measure is in terms of group's size, the remaining three measures are based on the level of group's diversification. The industry classification system, which determines the latter three variables, is based on CMIE industry classification system (obtainable from the authors).

SIZE – Group size in terms of number of member firms in the group. All firms that are listed on PROWESS as associated with the group are counted regardless of whether they are listed on the Bombay Stock Exchange.

COUNT – Group diversification in terms of number of industries represented in the group. All firms that are listed on PROWESS as associated with the group are counted regardless of whether they are listed on the Bombay Stock Exchange.

FOCUS – Group concentration level. Calculated as the ratio of group's sales from the industry with the highest sales to total group's sales. Thus FOCUS is defined as: $MAX\ S_{jg} / S_g$, where S_{jg} = Sales generated by group g from industry j; and S_g is total sales generated by group g. Only firms with year ending March 2000 and available sales data are included in the calculation. However, for groups where less than two such observations are available, FOCUS is set to a missing value.

HERFIND – The Herfindahl concentration value calculated as the ratio of the sum of the squares of each industry's sales to the squared value of total group's sales. Thus HERFIND is defined as: $?S^2_{jg} / S^2_g$, where S_{jg} = Sales generated by group g from industry j; and S_g is total sales generated by group g. Only firms with year ending March 2000 and available sales data are included in the calculation. However, for groups where less than two such observations are available, HERFIND is set to a missing value.

Appendix B: Sample Selection Procedure
Broad Sample of Indian Private Sector group affiliated firms

Full Sample (Indian Private Sector, BSE quoted and unquoted)[35]		6548
Less: Independent firms		(4506)
Group affiliated firms used to construct group size and diversification variables		2042
Distribution of affiliated firms across business group types:		
Firms affiliated with Top business houses (50 groups)	921	
Firms affiliated with large business houses (98 groups)	458	
Firms affiliated with other business houses (227 groups)	663	
Total firms affiliated with Indian Private business houses (375 groups)		2042

Narrow Sample

Indian Private Sector, non-financial, quoted firms with all required data		1412
Distribution of narrow sample across listing flags:[36]		
Flag A	61	
Flag B1	320	
Flag B2	992	
Flag Z	39	
		1412
Distribution of narrow sample across group affiliated and independent firms:		
Independent firms that paid dividends	325	
Independent firms that did not pay dividends	533	
Total independent firms		858
Group-affiliated firms that paid dividends	322	
Group-affiliated firms that did not paid dividends	232	
Total group-affiliated firms		554
		1412

[35] There are 2369 unquoted firms and 4179 quoted firms. Of the quoted firms 79 are in the Listing Flag A group, 586 in the B1 group, 2813 in the B2 group and 701 in the Z group. For listing flags definitions see footnote (2).

[36] The classification of a firm into listing flag groups is decided by the Bombay Stock Exchange. The listing flag denotes the volatility of the stock of the company on the Exchange. Stock in the A group has carry forward deals and weekly settlements. Those in B1 and B2 trade with weekly settlement without carry forward facility. Z is a relatively new category that denotes companies who have not complied with and are in breach of provisions of the Listing Agreement.