Diversification, Propping and Monitoring: Business Groups, Firm Performance and the Indian Economic Transition*

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Abstract

The industrial landscape of many emerging economies is characterized by diversified business groups. Given the well-known costs of diversification, their prevalence in emerging economies is a puzzle that has not been completely resolved. While there is evidence that business groups in emerging economies confer diversification benefits on group affiliated firms by substituting for missing institutions and markets, whether such benefits persist over the economic transition as institutions and markets develop is unclear. We investigate this issue in the context of the wide-ranging transformation of the Indian economy over the past decade. We find that business group affiliation continues to generate higher market valuation vis-à-vis standalone firms ten years into the transition, but diversification is not the source of these benefits. Instead, we find that propping through profit transfers among firms within a group and better monitoring through group level directorial interlocks explains the higher market valuation of business group affiliated firms. The effect of propping and directorial interlocks on firm value depends on the equity stakes of the controlling shareholders. Propping appears to be the source of group affiliation benefits in firms with below median cash flow rights of the controlling shareholders, while director interlocks are the primary source of the group effect for firms where the controlling shareholders have above median cash flow rights.

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1. Introduction

Recent interest in the industrial and financial organization of emerging and transition countries has led to a greater appreciation that the organizational landscape of many emerging economies is dominated by diversified business groups. Business groups dominate private-sector industrial activity in economies such as Brazil, Chile, Hong Kong, India, Indonesia, South Korea and Taiwan, among others[1]. In India for example, groups have accounted for nearly sixty per cent of manufacturing sector assets during the last decade. Given the prominence of business groups in many emerging economies, does business group affiliation improve firm performance? If there is a beneficial effect, what is the source? How does this relationship change as an emerging economy develops? In this paper we investigate these questions in the context of the dramatic and wide-ranging transition of the Indian economy over the last decade.

There are a number of reasons why these are important questions and India presents a good laboratory for examining them. Among the most notable features of emerging economy business groups is the fact that they are widely diversified into disparate industrial areas[2]. Consequently, business groups provide further grist for the corporate diversification debate.

Despite active research in the area, there continues to be disagreement over whether diversification is value destroying or value enhancing for firms. While a number of papers (Lang and Stulz, 1994, Berger and Ofek, 1995, Servaes, 1996, Lins and Servaes, 1999) have argued that corporate diversification has not enhanced the value of firms in the developed world (U.S., U.K., Germany and Japan), a recent paper by Campa and Kedia (2002) has questioned these results by arguing that previous studies do not account for the endogeneity of firms that choose to diversify. Using U.S. data they find that once the presence of self-selection in the decision to diversify is accounted for, the diversification discount drops and sometimes becomes a premium.

In the context of emerging economies, Khanna and Palepu (2000a) have argued that diversification can be valuable. In their pioneering study, they use data from 1993 to examine the performance of firms belonging to diversified Indian business groups relative to unaffiliated firms, and find evidence that firm performance initially declines with group diversification but subsequently improves once group diversification exceeds a certain threshold. In other words, there is a threshold in the extent of diversification before group affiliation becomes profitable.

[1] See Ghemawat and Khanna (1998) for extensive multi-country references.

[2] For example, the House of Tata in India has interests in steel, watches, detergents, tea, automobiles, and computer software. Grupo Luksic of Chile has interests in banks, hotels, mining, beer and pasta. Grupo Carso of Mexico has firms in telecoms, internet services, retail and finance. See "When eight arms are better than one," *The Economist*, Sept. 12, 1998, pp. 67-68.

They suggest that the most diversified business groups add value by replicating the functions of institutions (legal and financial) and intermediaries (product market, labor market and capital market) that are missing or inadequate in an emerging market. Business groups are better able to cope with such inadequacies than smaller firms because their scale and scope enables them to spread the fixed costs associated with performing the functions that stand-alone institutions usually perform in advanced economies.

While Khanna and Palepu's (2000a) analysis uses data on Indian business groups from 1993, this study uses data from 2001. This difference is particularly significant because the Indian economy has experienced a decade of dramatic liberalization and wide-ranging transformation of its competitive and institutional environment. Many of the institutional inadequacies and market imperfections that underlie Khanna and Palepu's rationale for group benefits have experienced considerable improvement[3]. The fact that the institutional context of India in 2001 is dramatically different from what it was in 1993 facilitates an assessment of whether and how the benefits and costs of group affiliation have evolved with the institutional environment.

Our empirical inquiry therefore begins by comparing the performance of group affiliates with the performance of unaffiliated firms. Using a measure of current (accounting) performance, return on assets (ROA), as well as a forward-looking measure of performance, Tobin's q, we find no evidence for the existence of a threshold level of diversification beyond which group diversification becomes beneficial. Instead, with respect to both measures, and after controlling for group affiliation, we find that group diversification has a negative effect on the performance of group affiliates. Moreover, we find that after controlling for group diversification, while group affiliation itself has a positive and significant effect on Tobin's q, it has a negative impact on performance using ROA. The absence of diversification benefits and threshold effects are robust to the sub-sample of only group affiliated firms. In other words, while there are benefits to group affiliation reflected in Tobin's q, diversification does not appear to be the source of the positive group effect.

Taken together, these results -- the negative group effect with respect to ROA but positive group effect with respect to Tobin's q, the negative effect of diversification with respect to both ROA and Tobin's q, and the absence of any quadratic-threshold effect once group affiliation is accounted for -- suggest considerable differences in the role of business group affiliation between 1993, the time period for Khanna and Palepu's study, and that of 2001. This could be because the institutional environment of India has evolved to the extent that the

[3] We provide an overview of the changes that the Indian economy has experienced in section 2.

"institutional voids" that business groups bridged and augmented through diversification are no longer as critical. However, while diversification does not appear to be the continuing source of group benefits, we are still left with the puzzle of where the group affiliation benefits, as reflected in Tobin's q, are continuing to come from. This is what we try to pin down in the subsequent analysis of the paper.

Recent studies of other emerging economies do not find beneficial effects of diversification either. In a study of Korean business groups, Joh (2003) finds that large *chaebols* under-perform unaffiliated firms and this is attributable to expropriation of firm resources (tunneling[4]) by controlling shareholders. In a cross-country study of seven emerging markets[5], Lins and Servaes (2002) find that diversified firms trade at a considerable discount compared to single-segment firms and the discount is most severe when management control rights exceed cash-flow rights, also suggesting expropriation in diversified firms. A recent paper by Claessens, Fan and Lang (2002) investigating the benefits and agency costs of using internal capital markets through affiliating with groups in nine east Asian economies[6] finds the value benefits associated with group affiliation accrue to more mature, slower-growing and financially-constrained firms. These gains are especially large for group-affiliated firms with more agency problems, as indicated by the divergence between ownership and control stakes of the largest ultimate owner. They suggest this as evidence for a perverse rather than useful role for groups.

While tunneling has been associated with business groups in several emerging markets, including India (Bertrand, Mehta and Mullianathan, 2002; Cheung, Rau and Stouraitis, 2004), it is however difficult to see how it could explain the positive effect that group affiliation has on a forward looking performance measure such as Tobin's q. For this we turn to its mirror image, propping, and investigate whether this could be the source of group benefits that we observe in our sample. A recent paper by Friedman, Johnson, and Mitton (2003) (henceforth FJM) argues that in many countries with weak legal environments, controlling shareholders sometimes clandestinely use private resources to provide temporary support to firms that are in trouble, i.e., prop up firms. Propping today can be beneficial because it preserves the option to expropriate and obtain a legitimate share of profits tomorrow. The propensity to prop is thus correlated with the propensity to tunnel and both are associated with firms that have minority shareholders.

FJM suggest that propping helps explain why many firms in emerging markets rely heavily on debt finance. Normally a weak legal system would seem to make debt unappealing

[4] Johnson, La Porta, Lopez-de-Silanes and Shleifer (2000) explain tunneling in detail.
[5] Hong Kong, India, Indonesia, Malaysia, Singapore, South Korea and Thailand.
[6] Hong Kong, Indonesia, South Korea, Japan, Malaysia, the Phillipines, Singapore, Taiwan and Thailand.

because creditors can never effectively take control of collateral. In this context, debt is a commitment by the entrepreneur to bail out a firm when there is a moderately bad shock[7]. The direct effect of debt is to increase the potential for propping and make it more likely that outside investors will participate in financing the firm. Propping thus makes issuing debt attractive to investors when courts cannot enforce contracts[8].

Using the debt ratio of a firm as a measure for propping as in FJM (2003), we find that the group effect disappears in the Tobin's q regression and is weakened in the ROA regression once propping through debt is accounted for. The debt ratio is statistically significant in both performance regressions and has a positive effect on Tobin's q. The positive effect on Tobin's q is consistent with the theory that propping through debt commits the controlling shareholder of the business group to bail out an affiliated firm in the event of future shocks and is valued by the market. We expecting the likelihood of propping to increase in firms with lower ownership concentration since the divergence between ownership and control is usually greater in such firms (Claessens, Djankov, and Lang, 2000). Accordingly, we divide our sample into two sub-samples split by the median level of the stake of controlling shareholders, known in India as the "promoter's share". We run both the ROA and Tobin's q performance regression with debt as a control variable separately for each sub-sample and examine whether propping is a source of group benefits.

With regard to both Tobin's q and ROA, we find an asymmetry in the effect of group affiliation between the two sub-samples. While the effects of group affiliation on Tobin's q and ROA for the above median sub-sample closely mirror the results with respect to the pooled sample, positive in the first case and negative in the latter, there are no significant differences between group affiliated and standalone firms in the below median sub-sample with respect to both performance measures. Once we incorporate debt, we find that debt has a positive and significant effect on Tobin's q for both the above and below median firms, whereas it has a negative and significant effect with respect to ROA for both sub-samples. What is particularly noteworthy is that while positive group effects with respect to Tobin's q continue to persist once debt is controlled for in the above median firms, group effects for the below-median firms become negative and significant once debt ratio is controlled for. The latter result, we argue is

[7] However, this debt also creates a potential cost in that it makes it more likely that the entrepreneur will abandon the firm, i.e., take the money and run, when there is a very bad shock.

[8] FJM (2003) find evidence from the Asian financial crisis of 1997-98 to be broadly supportive of propping. They find that pyramid firms (more prone to tunneling and propping) with more debt experienced smaller stock price declines during the crisis.

indicative of the presence of propping; once propping through debt is accounted for by investors, group affiliates are worse off relative to standalones.

The evidence that propping could be a source of the higher market value of group affiliated firms where promoter stakes are lower and where the divergence between cash flow and control rights are expected to be higher, is however, not directly apparent with respect to ROA in the below median sample. To probe further, we devise an alternative test for propping that is in effect the mirror image of Bertrand *et. al's* (2002) methodology to detect tunneling in Indian business groups. Bertrand *et al.* argue that if the controlling shareholder tunnels, he will transfer profits from firms where he has low cash flow rights to firms where he has high cash flow rights. As a result, group firms will be more sensitive to shocks affecting low-cash-flow-right firms in their group than to shocks affecting high-cash-flow-right firms. The mirror image of this is that if the controlling shareholder engages in propping, there will be transfers from high-cash-flow-right firms to low-cash-flow-right firms and thus group firms will be more sensitive to shocks affecting high-cash-flow-right firms than shocks affecting low-cash-flow-right firms. We devise a version of this test that fits our sample and find strong evidence for this interpretation of propping on ROA.

Turning to our results obtained with respect to the above median firms, while we narrow down the positive group affiliation effect after controlling for debt, propping does not appear to be the whole story and we therefore probe the issue further. A large literature (Richardson, 1987; Mizruchi, 1996; Haunschild and Beckman, 1998) suggests the importance of monitoring and information flows that are facilitated through interlocks at the board of directors' level. We therefore examine whether greater monitoring of subsidiaries by the core firm of a business group through interlocks at the corporate board of directors level can explain the positive effect of group affiliation for the firms with more concentrated shareholding. We find that indeed, once interlocks are accounted for, the positive group effect disappears. However, the positive effect of the debt ratio continues to be significant though its magnitude is dwarfed by that of interlocks. In other words, in firms with more concentrated shareholding, the benefits of business group affiliation appear to stem primarily from better monitoring of managers and better information flows, though propping through debt plays a role too. No such benefits of managerial interlocks with respect to market value are apparent with respect to the below- median firms, nor with respect to ROA for both below and above-median firms.

To summarize, our analysis suggests that in the context of India in 2001, the benefits from business group affiliation are associated with expected future performance but not current performance. Diversification does not confer benefits, nor is there evidence for a threshold effect

for diversification. Propping appears to be the source of group affiliation benefits for firms with less concentrated ownership while for firms with more concentrated ownership monitoring and information flows through director interlocks are the primary source of group effect. All of this taken together suggests that the evolution of the institutional context can bring in significant changes in the role and function of business groups.

The paper is organized as follows. In section 2 we provide a brief overview of the wide ranging reforms the Indian economy has experienced since 1991 and the impact this has had on the institutional framework. In section 3 we describe our data and empirical strategy. Section 4 describes our results on the relationship between group affiliation and firm performance. Section 5 investigates the effects of diversification. In section 6 we explore propping and managerial integration as alternative explanations for group affiliation benefits. We summarize and conclude with Section 7.

2. The Indian Economy in Transition

Industrial policy in independent India[9] can be traced back to the Industries (Development and Regulation) Act of 1951 and the Industrial Policy Resolution of 1956. These blueprints of planned economic development accorded the "commanding heights" of the economy to the public sector and emphasized extensive state regulation of private sector activity to ensure that it "necessarily fit into the framework of the social and economic policy of the State." The private sector was expected to play only a residual role in the country's developmental process. Numerous restrictions were placed on private sector activity. These included industrial licensing to direct resources into priority areas, reservation of production activities to encourage the growth of the small-scale sector, location restrictions to promote the development of backward areas, size restrictions to prevent the concentration of economic power (Monopolies and Restrictive Trade Practices (MRTP) Act, 1969), and import licensing through import quotas and tariffs to create entry barriers for foreign investors (Foreign Exchange and Regulation (FERA) Act, 1973).

This resulting morass of rules, bureaucracy and distorted incentives discouraged entrepreneurship, fostered corruption and political influence, and retarded economic growth and development. India's average rate of growth over the period 1960-1985 was 3.9% with high year-to-year volatility attributable to the vagaries of rainfall and agricultural output. The situation reached a crossroads in 1991 when India faced a severe foreign exchange crisis and the

[9] India achieved Independence from colonial rule by the British on August 15, 1947.

possibility of defaulting on payments. As a result, the Indian government had to turn to the IMF and the World Bank for financial assistance. Circumstances combined to compel the government to commit to a comprehensive and sustained structural reforms program that had at its core the liberalization of the industrial and trade policy regime.

The "New Economic Policy" was formalized in the detailed Statement on Industrial Policy of 1991. External and internal liberalization were integral parts of the reform agenda. With respect to the private sector, licensing for almost all industries[10] was abolished. The MRTP Act was completely overhauled to focus on unfair and restrictive trade practices rather than size and concentration of economic power. International competition was encouraged through a more liberal policy toward foreign direct investment (FDI), reduction of trade barriers, and a decisive shift away from import substitution. Foreign competition was encouraged with the view that this would force the Indian private sector to become more efficient and spur innovation in management, technology and capital formation. Majority foreign ownership was permitted and foreign exchange restrictions were eased through an overhaul of the FERA Act.

Along with industrial and trade policy reforms, financial sector liberalization took place together with tax reform. Corporate tax rates were reduced and harmonized to create a level playing field across different types of firms and industries. Financial sector reforms, particularly capital market liberalization, made credit easier and cheaper for Indian companies, both in the domestic and international capital markets. Changes in merger and acquisition regulations reduced distinctions between domestic and foreign firms.

Deregulation of the stock market formed an important component of the financial sector reforms program. An important measure in this respect was the repeal in May 1992 of the Controller of Capital Issues Act (CCI Act) of 1947, after which companies became free to price their primary issues in accordance with market forces. The Securities and Exchange Board of India (SEBI) Act of 1992 established and gave the SEBI statutory powers to foster and regulate the securities market. The functions of the Securities and Exchange Board of India are similar in scope to the Securities Exchange Commission (SEC) in the US.

The cumulative effect of these deep and wide-ranging reforms has been to substantially transform the functioning of the Indian economy. Appendix 1 summarizes the major policy reforms of Indian economy over the last decade.

[10] A short-list of seven industries of strategic and security importance were still subject to licensing.

3. Sample, Empirical Estimation and Variables

3.1 Sample

The data for our study of the performance effects of business group affiliation is drawn from the *Prowess* database published by the Center for Monitoring the Indian Economy (CMIE). The Prowess database contains detailed information on the financial performance of companies in India compiled from their profit and loss accounts, balance sheet, and stock price data. The database also contains background information on ownership pattern, product profile, and board of directors of the companies. This database has formed the basis of several recent empirical studies on the Indian corporate sector (see for example, Bertrand, Mehta and Mullainathan, 2002; Khanna and Palepu, 2000a; Sarkar and Sarkar, 2000).

The sample for our analysis covers a total of 2,298 Indian private sector companies listed on the Bombay Stock Exchange as of 2000-01 for which all the relevant data were available. Of the sample companies, 741 are affiliated with business groups and 1,557 are stand-alones or unaffiliated companies. The 741 group affiliated firms belong to 393 business groups. The year 2000-01, for which we conduct the analysis, marks the completion of a decade of structural reforms that were initiated in India in July 1991, a period possibly long enough to capture some of the effects of the reforms on the characteristics and functioning of business groups.

The companies in our sample belong to both the manufacturing and service sectors. Each company's activity in the Prowess database has been assigned a standardized National Industrial Classification (NIC) code both at the two digit and three digit levels. The NIC is largely in line with the International Standard Industrial Classification (ISIC) developed by the United Nations. It should be noted that a large majority of Indian private sector firms are predominantly focused on a single activity and hence are coded as single segment firms in the Prowess database, with the remaining being classified as diversified.

3.2 Empirical Estimation

We set up our empirical analysis in a sequential way that is consistent with the line of inquiry as set out in the introduction. We first focus on the question of whether group affiliated firms necessarily outperform their stand-alone counterparts in an emerging economy.

Second, we address the question of whether group diversification is one of the potential sources of benefits for group affiliated firms in emerging economies like India. Here, we use the

findings of a study by Khanna and Palepu (2000a) (henceforth K&P) as a benchmark for our results. The K&P study addressed this question using Indian data pertaining to 1993, two years into the reforms process. A comparative assessment of the results obtained in the earlier study with that of our study can help to decipher shifts, if any, that may have occurred in the relationship between group diversification and the performance of group affiliates as the institutional landscape changed over time. To this end, we apply the basic empirical framework of Khanna and Palepu (2000a) and test whether the U-shaped relationship between diversification and performance, whereby firms affiliated to groups beyond a threshold level of diversification outperform focused stand-alones, continues to hold in 2001.

Thus, we estimate the following model:

Performance variable = log(firmsize) + age + group diversification measure
+ group size + group dummy + industry dummies + error (Model 1)

Model 1 is estimated over the entire sample of stand-alone and group affiliated firms. We estimate three specifications of Model 1. The first two specifications are akin to those estimated in Khanna and Palepu (2000a), namely, estimating the presence of a group effect by incorporating only a group dummy along with the control variables of size and age (Specification 1), and the second specification (Specification 2) estimating the model without the group dummy, but with the diversification measures and group size variable along with the control variables. We introduce an additional third specification of Model 1 (Specification 3) by extending this model to explicitly re-incorporate effects of group affiliation along with the diversification measures, control variables and group size measure. Thus, under Specification 3, we analyze whether the relationship between diversification and performance, if any, holds after controlling for the effects of group affiliation not incorporated in Specification 2. If group diversification captures all the effects of group affiliation, we would expect group effects to be statistically insignificant after controlling for group diversification, but diversification effects to persist. If instead, group effects continue even after controlling for diversification, then it is important to understand what could be the source of such effects.

To gain insight into the question of how group diversification impacts the performance of only group affiliated firms, we also estimate the relationship laid out in Specification 2 for the sub-sample of group affiliated firms (Model 2). This exercise also serves as a robustness check for Model 1 in the sense that one can check whether the relationship between diversification and

performance obtained in Model 1 by pooling standalones and group affiliates also holds good for the sub-sample of group affiliated firms with respect to which most of the variation in group diversification arises.

Thus, we re-estimate Model 1 for group-affiliated firms only:

Performance variable = log(firmsize) + age + group diversification measure
+ group size + industry dummies + error (Model 2)

The third step in our empirical analysis focuses on explaining the sources of group effects that remain after controlling for group diversification and group size in Model (1). Here, as explained earlier, we focus on an important source of benefit for firms affiliated to groups, namely those stemming from propping via debt as in FJM(2003). To examine the effect of propping on firm performance, we incorporate in Model 1 an indicator of propping at the firm level, namely the debt ratio defined as the ratio of total firm borrowings to total firm assets. We thus estimate the following model (Model 3):

Performance variable = log(firmsize) + age + debt ratio + group diversification measure
+ group size + group dummy + industry dummies + error (Model 3)

We estimate two specifications of Model 3. Under Specification (i) we estimate Model 3 for the pooled sample of standalones and group affiliated firms. Given that the propensity to prop is generally stronger for firms with lower ownership concentration, we estimate Specification (ii) under which we separate the sample into two parts by median promoter shareholding, one with firms equal to or above the median, the other with ownership below the median and estimate Model 3 separately for each sub-sample.

Finally, to account for any residual group benefits that remain in the sub-samples after accounting for propping, we incorporate a group level measure of managerial integration in Model 3 for each of the sub-sample of firms and estimate the model separately for these sub-samples.

3.3 Variables

We consider two performance variables, one an accounting measure, the other a market measure. The accounting measure of performance is a firm's return on assets that is defined as (profit after taxes + interest * (1 – tax rate)) / (total assets), ROA, in line with a similar measure

applied by K&P.[11] We carry out a robustness check also with earnings before depreciation, interest and taxes (PBDIT) which has been used as a standard measure of performance for many studies including those with respect to India. The market measure of performance that we choose is a proxy for Tobin's q. Tobin's q is defined as the ratio of the market value of equity and market value of debt to the replacement cost of assets. However, in India as in many developing countries, the calculation of Tobin's q is difficult primarily because a large proportion of the corporate debt is institutional debt which is not actively traded in the debt market. Also, most companies report asset values to historical costs rather than at replacement costs. We therefore calculate the proxy for Tobin's q, an adjusted Tobin' s q used in other published studies on India (see for example, Khanna and Palepu, 2000a, Sarkar and Sarkar, 2000) by taking the book value of debt and the book value of assets in place of market values.

Our main diversification measure is the count measure of diversification which has been used in several diversification-performance studies including K&P. We perform robustness checks with respect to two other important diversification measures, namely the Herfindahl index and the weighted diversification index (WDI) (Caves *et al.*, 1980). The count measure at the group level (n_act) is the number of distinct NIC two-digit industries in which group firms operate. Since more than one firm in a group can operate in the same industry, the number of activities in which a group engages may be smaller than the number of firms. The value of n_act for standalone companies is taken as one. The Herfindahl index (herf_ind) is measured as the sum of the squares of the each industry's sales as a proportion of total group sales and takes the value of one for the most focused group engaged in only one activity with value decreasing with increased diversification. The value of herf_ind for the focused standalones is taken as one. Finally, the weighted diversification index (WDI) (Caves et al., 1980) is adapted from the firm level and computed at the group level to capture the diversity of a multi-product group in terms of the distance of its different activities from its primary or core activity which accounts for the largest proportion of the group's sales.[12] The WDI for standalone firms is taken as zero given

[11] While Khanna and Palepu (2000a), in calculating ROA, apply an average tax rate for each firm, we apply the uniform corporate tax rate of 39.55 (KPMG, 2002), prevailing in 2000-01, across all firms. While tax rates can differ across companies and across industries, we use a uniform tax rate because interest expense is treated symmetrically for all firms.

[12] The distance in WDI is measured in terms of the NIC codes. If a group affiliate belongs to the same three-digit NIC code as the activity of the core firm, then distance is taken as zero; if a group affiliate has the same two-digit NIC code but a different three digit code as the core firm activity, then distance is taken as one and if the NIC codes of the core firm and the group affiliate are different at the three digit level, then the distance is measured as two. Given the distances so computed for each group affiliate, the distance of each firm is weighted by the proportion of the firm's assets out of total group assets. The WDI is then derived as a sum of the weighted distances across all firms within a group. Thus, by construction, WDI

that the distance from its own activity would be zero. Group size in our model is measured by the number of firms in the group and is taken as one for standalones.

In estimating all model specifications, we check for the possibility that the observations within a group may be correlated (see for example, Moulton, 1986; Khanna and Palepu, 2000a). Ignoring such correlation, to the extent they are present, would lead to inconsistent estimates of the standard errors and hence to inconsistent test statistics. We conduct the specification test by estimating a variance components model wherein all observations within a group share a common variance component and then check if this variance component is statistically significant. The chi-square statistics does not detect any significant presence of within-group correlations. This is perhaps not unexpected because common group characteristics which are the potential cause of such correlations may have been adequately captured by the control variables. Following this specification test, we estimate all our models by OLS and compute robust heteroskedasticity-consistent errors following White's method.

4. Group Affiliation and Firm Performance

4.1 Summary Statistics

Table 1 presents summary statistics for group affiliated and standalone firms in our sample. As is evident from the Table, group affiliated firms on the average are around ten times larger than standalones, both in terms of assets and sales. The mean sales and assets of group affiliated firms are Rs. 3,957 million and Rs. 6,045 million respectively, whereas the corresponding values for standalones are Rs. 359 million and Rs. 563 million. Group affiliated firms are on the average older than standalones: 26 years compared to around 16 years. Group affiliated firms are also found to be more leveraged than standalones. Further, simple means tests shows that group affiliated firms have significantly higher return on assets, and higher Tobin's q.

Table 2 presents summary statistics for the major group level variables, namely diversification measures, group size and the proportion of listed firms in a group. Although our sample consists of only listed firms, group level measures have been calculated by considering both listed and unlisted firms as reported for each group in the Prowess database. As Table 2 shows, groups on the average are engaged in five distinct 2-digit industries, and the most diversified group is engaged in twenty-six distinct activities. Comparative estimates of n_act for 1993 (Khanna and Palepu, 2000a) show that the average number of activities has increased

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ranges between zero and two and assigns special significance to a group's primary or core activity by considering the distances of secondary activities from the primary activity.

between 1993 and 2001; whereas the mean value of n_act in 1993 was 3.76, the corresponding value for 2000-01 is 5.11. Also, the maximum number of activities in which a group has been engaged has increased from the 13 reported for 1993 to 26 reported in 2000-01. The maximum size of a group in terms of the number of firms is 96, and on the average 65 per cent of group firms are listed. The mean value of the managerial integration measure, group_interlock is 0.64. We explain the director interlock measure in detail in section 6.

[Tables 1 & 2 here]

4.2 Effect of Group Affiliation

As stated in Section 3, the relationship between diversification and performance is estimated in a multivariate regression framework as laid out in Model 1. Table 3 reports the results for the two performance indicators, ROA and Tobin's q. In the case of both sets of regressions, we estimate three specifications of Model 1, specifications 1, 2 and 3 as outlined in the previous section.

Under Specification 1, we incorporate only a group effect along with the control variable, where the dummy variable group equals one if a firm belongs to a business group and zero otherwise. The estimates with respect to the effect of group affiliation on accounting and market measures of performance are shown in columns (i) and (iv) of Table 3, respectively. The estimates show that the group dummy is negative and significant at 1 per cent for ROA. In contrast to this, the estimate of the group dummy with respect to Tobin's q, as shown in column (iv) of Table 3, reveals that group effect is positive and statistically significant with a p-value of 0.0151. Thus, vis-à-vis the stand-alone firms, group affiliation has an adverse effect on current measure of performance as captured by ROA, but leads to better expected future performance as captured by the forward looking market measure, Tobin's q.

Since Specification 1 mirrors the one estimated by Khanna and Palepu (2000a) with regard to Indian corporates, a comparison of our results with that obtained in the earlier study is instructive. While both studies, conducted with data seven years apart, find group affiliation to have a negative and significant effect on accounting rates of return, the results with respect to the market measure differs. While the earlier study finds group affiliation to have no significant impact on Tobin's q, our study finds that group affiliation has a positive and significant effect on Tobin's q after controlling for age and size of the firms.

[Table 3 here]

5. Group Diversification and Firm Performance

5.1 Full Sample

The estimates with respect to the effect of diversification in terms of the count measure n_act on firm performance is shown in columns (ii) and (v) of Table 3. Benchmarking our specification with that in K&P, we first test whether group diversification and firm performance have a quadratic relationship. As is evident from Table 3, the existence of a quadratic relationship is supported with regard to ROA. The coefficient of n_act with respect to ROA is negative and significant at 1 per cent and that of n_act^2 is positive and significant at around 4 per cent. This is consistent with the results of K&P obtained with 1993 data. The negative coefficient on n_act and a positive coefficient on n_act^2 suggest that the relationship between firm performance and group diversification is U-shaped, with firm performance declining initially as diversification increases, reaching a minimum, and then increasing with group diversification. Such a relationship in turn suggests the existence of a threshold level of group diversification beyond which group affiliated firms reap the benefits of such diversification.

With respect to the effect of group diversification on market value of firms, as column (v) of Table 3 shows, the effect of diversification on market measures seems to be at odds with results obtained with respect to profitability and those obtained in K&P. As the estimates show, while n_act has a negative but insignificant effect on Tobin's q, the coefficient of n_act^2 is negative and highly significant with a p-value of 0.0018 in the case of Tobin's q. The coefficient estimates with respect to diversification thus do not suggest the existence of a quadratic relationship with market measures unlike the one obtained with respect to the accounting measures. Instead, one finds that the coefficient of n_act is not significantly different from zero, while that of the square term is a negative suggesting a negative and concave relationship between group diversification and Tobin's q.

As discussed in Section 3.2, in order to examine whether the diversification effects in columns (ii) and (v) of Table 3 continue to hold even after controlling for the effects of group affiliation, we control for a group effect in the regressions that include diversification effects by re-introducing the group dummy (Specification 3). The estimates under specification 3 are presented in columns (iii) and (vi) and Table 3.

As can be seen from the relevant columns in Table 3, while the coefficient of n_act remains negative and highly significant for ROA with a p-value of 0.0355, the coefficient of

n_act^2 becomes statistically insignificant, so that the quadratic relationship between diversification and performance found earlier under Specification 2 ceases to hold. Instead, the relationship between group diversification and firm performance becomes negative and monotonic. However, as judged by the coefficient estimates of the group dummy, the group effect continues to remain negative and statistically significant after controlling for diversification but the magnitude of the group effect decreases relative to that obtained in Specification 1. These results together suggest that the quadratic effect obtained under Specification 2 could have misleadingly incorporated omitted non-diversification related group effects. The results under Specification 3 therefore do not indicate any beneficial effects of increased group diversification on firm performance; instead, we find that firms belonging to more diversified groups perform worse than more focused counterparts, including stand-alones.

With regard to the market measure, as column (vi) of Table 3 reveals, once group affiliation is controlled for under Specification 3, the coefficient of n_act continues to remain insignificant, and the coefficient of n_act^2, while continuing to be negative, becomes insignificant at conventional levels, with a p-value of 0.1115. Thus, the effect of group diversification on Tobin's q disappears at conventional levels of significance once we control for group effects in Specification 3. What is of special interest is that as in the case of ROA, the group effect in the case of Tobin's q continues to be significant at around 10 per cent, but is positive, suggesting that group covariates, namely group diversification and group size do not entirely capture the effects of group affiliation on firm performance. In order to check whether a linear relationship between diversification and Tobin's q is a better fit than the quadratic specification, after controlling for group effect, we estimate Specification 3 with respect to Tobin's q but incorporating only n_act. We find that diversification has a statistically significant negative effect on Tobin's q with a p-value of 0.0553 (not reported in Table 3). The positive group effect still persists and is significant at around 1 per cent.

5.2 Group-Affiliated Firms

To further probe whether increased group diversification indeed affects firm performance adversely and check the robustness of the results obtained in the pooled sample of stand-alone and group affiliated firms, we estimate this relationship for group affiliated firms alone (Model 2). This will eliminate the effect that non-diversified standalone firms had on the coefficient estimates and provide insight into the question of whether firms affiliated to more diversified groups perform better than their more focused counterparts. Additionally, we address the

question of whether there is a threshold level of diversification beyond which such group benefits accrue to affiliated firms.

Table 4 presents the estimation results for the accounting measure ROA and market measure, Tobin's q. For each measure, we run two specifications, first the quadratic one that we estimated for the pooled model, and the second a linear one, in order to decipher the exact nature of the relationship between group diversification and performance of group affiliated firms. With respect to ROA, going by the coefficient estimates of n_act and n_act^2, one does not find any evidence of the existence of a quadratic relationship of firm performance with group diversification. Neither the coefficient of n_act which is negative, nor the coefficient of n_act^2 which is also negative, are significant at conventional levels. Introducing a linear specification of diversification, as is shown in column (ii) of Table 4 shows that the coefficient of n_act is negative and significant with a p-value of 0.0871. These results are similar to the results obtained for ROA under Specification 3 of Model 1 where we controlled for group affiliation while estimating the effects of diversification and found diversification to have a linear negative effect.

[Table 4 here]

Columns (iii) and (iv) of Table 4 presents the estimation results for Tobin's q for the sub-sample of group affiliated firms. As is evident from the columns, the performance of group affiliated firms is inversely related to group diversification. This result, and the absence of a quadratic effect are consistent with the results obtained under a linear specification for the pooled sample with respect to Tobin's q.

5.3 Control Variables

With regard to the importance of the key firm level control variables, i.e., sales and age, we find from Table 3 that larger sized firms, with size measured as log of sales, have higher accounting rates of return indicating the existence of scale economies. This is however not the case with respect to the effect of size on market measures; size has no statistically significant impact on the market valuation of firms. Older firms are found to be less profitable as measured by ROA and have lower market valuation as measured by Tobin's q. With respect to only group affiliated firms, as is evident from Table 4, larger firm size is associated both with higher profitability and higher valuation. Older group affiliated firms do worse in terms of both profitability and market value. Finally, firms belonging to larger groups do consistently better in terms of market measures as also with respect to ROA; for the sub-sample of group affiliated firms, larger group size leads to higher performance with respect to both accounting and market measures at conventional levels of statistical significance.

5.4. Robustness of Diversification Findings

We check the robustness of our findings on the effect of group diversification on the relative performance of group affiliate and standalone firms in several ways that are largely in line with those done in K&P (2000). First, we estimate the effect of group diversification on ROA and Tobin's q using two alternative measures of diversification, namely the Herfindahl index (herf_ind) and the Weighted Diversification Index (WDI). Second, we use an alternative measure of group size, namely, total group assets/sales other than the assets/sales of the firm in question, and check whether the relationship between diversification and performance that was obtained under the simplest measure of group size, namely the number of firms, continues to hold. Finally, we undertake a group level analysis where we regress aggregate group level performance measures on group diversification and group size.

With regard to the robustness of the diversification effect, when herf_ind is used as a diversification measure, we find evidence of a positive (negative) relationship between the herf_ind (1 – herf_ind) and ROA which implies that as group focus increases, ROA also increases. This result ceases to be significant once we control for group affiliation. As in the case of the count measure, we do not find evidence of a quadratic relationship between diversification and ROA. The absence of any diversification benefits and the absence of a threshold effect under herf_ind is also the case when Tobin's q is used as the performance measure. Similar qualitative results hold when we conduct robustness checks with the WDI measure. While we find evidence of a quadratic effect of WDI on ROA, this effect disappears when group affiliation is controlled for. There is also no evidence of any relationship between WDI and Tobin's q.

With regard to the second robustness test, we consider total group assets(sales) rather than the assets(sales)of the firm in question as an alternative measure of group size and estimate the relationship between diversification and firm performance using the count measure of diversification. Using the alternative group size measure, the same qualitative results with respect to diversification and performance hold with respect to Tobin's q. However the nature of the relationship changes with respect to ROA. When group size is measured by group assets or group sales, we find evidence of a quadratic relationship between diversification and ROA, with the relationship holding up even after explicitly controlling for group effect. The latter result is different from that obtained with respect to n_act, where the threshold effect disappeared once group effect was controlled for (Column (iii) in Panel A of Table 3). The relationship between alternative measures of group size and firm performance is however robust. As in the case of

n_act, group size as measured by total group assets(sales) has no significant effect on ROA, but has a positive and significant effect with respect to Tobin's q.

Finally, estimations at the group level, with group performance being regressed on group diversification and group size, support the finding of the absence of any beneficial or threshold effect of diversification on ROA and Tobin's q, as were obtained at the firm level. Closely following the group level analysis of K&P, we construct an industry-adjusted group Tobin's q as well as group ROA by subtracting from each of the group performance measures a weighted average of industry Tobin's q and ROA, where the weights are given by the ratio of assets of group firms in that industry to the total group assets. The Tobin's q and ROA for a particular industry is taken as the median Tobin's q and ROA of standalone firms in that industry.

There are 324 groups in our sample. The mean industry adjusted ROA across groups is 1.76 per cent with a standard deviation of 7.72, with the corresponding estimates for Tobin's q being 0.24 and 0.38. Of the 324 groups, a large majority of groups, i.e., 226 out-perform comparable portfolios of standalone firms with respect to ROA, and the remaining 98 do worse than their standalone counterparts. A still larger number of groups, i.e., 262, outperform comparable portfolios of standalones with respect to the market measure Tobin's q.

The mean group diversification, respectively, of the outperforming and underperforming groups (relative to stand-alones) with regard to ROA are 3.23 and 3.03, the difference being not statistically significant. Nor are groups in the former category significantly larger in size on the average compared to the latter. Multivariate analysis, regressing industry adjusted group ROA on group size and group diversification measure confirms the firm level finding of an absence of any benefits from group diversification. Instead, as in the case of the firm level analysis, group diversification is found to negatively affect group ROA.

Summary statistics with respect to the groups that outperform with respect to Tobin's q show that these are on the average more diversified in terms of the number of activities (3.36) as compared to the mean diversification of the underperforming groups (2.42) and this difference is significant at one per cent. However, multivariate analysis of the relationship between group diversification and industry adjusted group Tobin's q after controlling for group size do not provide any evidence that group diversification creates group value. Instead, consistent with firm level analysis, group diversification is found to adversely affect group value with the coefficient of n_act^2 turning out to be negative and significant.

5.5 Key Observations

Several robust conclusions can be arrived at from the empirical results presented with respect to group diversification and firm performance. First, there is no evidence that increased group diversification benefits the performance of affiliated firms. At best, under some specifications, we find diversification to have no effect on firm performance and at worst, it has a negative effect. The initial U-shaped relationship that we obtained under Specification 2 of Model 1 with respect to ROA suggesting that increasing diversification beyond a threshold may benefit firms, similar to that found in the 1993 study of Indian firms by Khanna and Palepu (2000), disappears once we control for group affiliation in the pooled sample. That the U-shaped relationship in the pooled sample may be driven by unaccounted-for group effects is evident from the fact that such a relationship ceases to hold once we account for group affiliation, and once we estimate the relationship only for group-affiliated firms. If the U-relationship was robust, it should have also prevailed for the sub-sample of group affiliated firms belonging to diversified groups. Similar evidence of a robust relationship is found in Khanna and Palepu (2000b) with respect to Chile in the early years of its reforms, where the U-shaped relationship between diversification and ROA persisted even after accounting for group effects (which were significant too). Further, in the same study, while group effects disappeared as reforms progressed, positive diversification effects seem to have persisted. This is not the case for our study. While we find that group effects persist after controlling for diversification, diversification effects themselves are either negative or insignificant once group effects are controlled for.

Second, estimation results with respect to market measures also suggest that group diversification does not confer statistically significant benefits in terms of company value. Like in the case of the accounting measure, at best, group diversification has no effect on company value under the quadratic specification when group affiliation is controlled for and is negative under a linear specification of the relationship between diversification and Tobin's q. Unlike the results obtained in K&P, there is no evidence of a U-shaped relationship between diversification and performance, either in the pooled sample or for the separate sub-sample of group affiliated firms.

The third key observation that one can make from the estimation results under Specification 3 of Model 1 is that statistically significant group effects persist even after controlling for key group attributes, i.e., group diversification and group size, in the regressions. This is especially the case with respect to our key performance measures, ROA and Tobin's q, where group effects remain significant at one per cent and 10 per cent, respectively. Further, it is of interest to note that group affiliation affects accounting measures of performance and market measures in opposite ways. While one would expect current profitability and market valuation to

move in the same direction, our results show that while group affiliation lowers current performance vis-à-vis stand-alones, such affiliation leads to higher market valuation compared to stand-alones. Taken together, these results suggest the presence of group specific factor(s) other than group size and diversification that might lead to higher market valuation of group affiliated firms despite lower accounting performance relative to standalones.

Thus we are still left with the puzzle of the positive effect of group affiliation on Tobin's q despite poorer current performance of group affiliates relative to standalone firms and of such effects persisting after controlling for diversification. The latter in turn suggests that the sources of costs of benefits and costs of group affiliation do not necessarily arise from, nor are confined to, group diversification.

6. Propping, Concentrated Ownership and Managerial Integration

To investigate the reasons behind the apparent mismatch between current and future measures of performance that our analysis suggests as well as to identify additional sources of group benefits and costs, we delve into the existing literature on business groups for potential clues. While K&P (2000a) argue that accounting conventions in India with regard to inter-corporate investments may potentially lead to a downward bias in ROA and a corresponding upward bias in Tobin's q, we look beyond accounting biases for other relevant explanations in this regard. Our finding that diversification is not the source of the higher value of group affiliated firms relative to standalones, despite lower current profitability, suggests it might be useful to focus on other characteristics of business groups that may generate value for their affiliates. Primary among these and highlighted in the literature are the benefits that may flow from ownership, control and management structure of group affiliated firms. Such benefits can flow from better monitoring by promoters of group firms with concentrated ownership, from propping of group affiliated firms through debt commitments or intra-group transfers made by controlling shareholders, and finally from higher managerial integration among group firms through, among other mechanisms, interlocking directorships that can facilitate intra-group monitoring and communication.

6.1 Full Sample

In order to examine whether benefits of group affiliated firms flow from propping, we first analyze whether this can account for unexplained group benefits that are present with respect to Tobin's q after taking into account group diversification and group size. As is evident from column (vi) of Table 3, these group benefits are significant at the 10 per cent level under a

quadratic specification of the diversification relationship, and at around one per cent under a linear specification of the relationship (not reported in the Table).

If propping explains some of the positive group effects, this should be manifested in the debt ratio having a positive and significant effect on market value after controlling for group affiliation and diversification, and the effect of group affiliation being reduced or possibly eliminated.

As discussed in the introduction, we first follow Friedman, Johnson and Mitton's (2003) approach to propping. According to them, propping helps explain why many firms in emerging markets rely heavily on debt finance. Normally a weak legal system would seem to make debt unappealing because creditors can never effectively take control of collateral. In this context, debt is a commitment by the entrepreneur to bail out a firm when there is a moderately bad shock. The direct effect of debt is to increase the potential for propping and make it more likely that outside investors will participate in financing the firm. Propping thus makes issuing debt attractive to investors when courts cannot enforce contracts. We therefore consider the debt ratio of a firm, measured as the ratio of total borrowings to total assets, as a measure for propping.

Table 5 presents the results of the estimation that includes a firm's debt-ratio, denoted by the variable debt-ratio, in Model 1. The estimates, shown in columns (ii) and (iv) are provided with respect to ROA and Tobin's q for the case in which group effects persist after accounting for diversification. Columns (i) and (iii) of Table 5 are the same as columns (iii) and (vi) of Table 3.

The existing literature on the effect of debt on profitability show mixed results (Joh, 2003), with debt having in some instances a positive effect (Hurdle, 1974) and in some instances a negative effect (Hall and Weiss, 1967; Gale, 1972). The estimates in Table 5 reveal that the debt ratio has a negative and significant effect on ROA. After we control for debt, we find that the negative group effect continues to remain statistically significant. In contrast to the results obtained with respect to ROA, the point estimate of the debt ratio with respect to Tobin's q is the opposite. The debt ratio has a positive effect on the market value of the firm and is statistically significant with a p-value of less than 0.0001. The positive group effect that was present earlier becomes insignificant (column (iv) of Table 5). The positive effect of debt on market value that we find is consistent with Jensen's (1986) theory that highlights the strategic role of debt in mitigating agency costs by curbing managerial incentives for overinvestment.

As is evident from Columns (ii) and (iv) of Table 5, while the debt ratio seems to negatively impact the current profitability of firms, the fact that positive group effects with respect to Tobin's q disappear once debt is controlled for suggests that debt is a valued attribute

with respect to market valuation and is a source of group benefits not explained by diversification.

[Table 5 here]

To find out whether the marginal effect of debt is different for group firms, we interact the group dummy with the debt ratio, but the coefficient of the interaction term turns out to be insignificant for both ROA and Tobin's q. Thus, the effect of debt ratio on both ROA and Tobin's q are not found to be different for group affiliated and standalone firms, but essentially stems from the higher debt ratio of group affiliated firms.[13]

If propping through debt is a source of group benefits, one would expect such benefits to be more pronounced in firms where the ownership stake of the controlling shareholder is lower. It can also be expected that if propping is the main source of group benefits in firms with lower ownership concentration, the positive group effects would not persist once propping is accounted for. On the other hand, in firms where the ownership stake is relatively high and where the propensity to prop is likely to be lower, group effects can be expected to persist even after debt is controlled for. Further, the effect of debt on performance for firms with higher ownership stakes is likely to be lower.

To investigate this issue, we split the sample of firms into two groups: (i) firms with the promoter (controlling shareholder) ownership below the median level of promoter ownership for the entire sample, and (ii) firms with promoter ownership above the median level.

6.2 Sub-samples

The pooled sample of 2,298 firms is divided into two sub-samples by median promoter ownership. Given that data on promoter ownership is missing for 509 firms, we divide the remaining 1,789 firms into two sub-samples, one with 894 firms with promoter ownership below the median ownership level of 48.32 per cent, and the second with 895 firms with firms equal to or above the median level.

Table 6 presents the summary statistics for the main variables of interest for the two sub-samples. As can be seen from the Table (columns (iii) and (vi)), firms with below-median promoter holdings are firms that are larger in size. This is to be expected as promoters are likely to have lower cash flow stakes in larger sized firms that are also likely to be the firms where the divergence between cash flow and control rights is the highest. Above-median firms have higher profitability and Tobin's q compared to below-median firms. For the above-median firms, a

[13] Since the coefficient of the interaction terms are not significant for either ROA and Tobin's q and the results with respect to the other variables do not qualitatively change, we do not report these in Table 5.

simple means test shows that there is a significant difference between the market value of group affiliated firms vis-à-vis stand-alones; no such difference exists for the below-median firms. With regard to profitability, group affiliates are shown to have higher ROA for both below-median and above-median firms. Further, with respect to both the below median and above median firms, group affiliated firms are found to be more leveraged than stand-alones, as well as of larger size.

[Table 6 here]

Estimates from multivariate analysis with respect to the two sub-samples are reported in Tables 7.1 and 7.2. Table 7.1 shows the effect of the debt ratio on ROA separately for below-median and above-median firms, whereas Table 7.2 shows the effect of debt ratio on Tobin's q by sub-samples. Columns (i) and (iii) of both Tables 7.1 and 7.2 show the effect of diversification when group effect is controlled for but prior to the inclusion of debt. As is evident from Table 7.1, and similar to the results obtained in the pooled sample, diversification has a negative and significant effect on ROA for both sub-samples. However, similar to the pooled sample, negative group effects persist with respect to the below-median firms, but no such group effects are apparent with respect to the above-median firms. Thus, negative group effects with respect to profitability that we find in the pooled sample seem to be emanating from firms with below-median promoter ownership.

[Table 7.1 & 7.2 here]

Once we introduce the debt ratio, we find from Columns (ii) and (v) of Table 7.1 that debt is negatively related to ROA and significant at one per cent. Further, the group effect becomes insignificant at the conventional levels in the below-median firms once debt is controlled for. For the above median firms, the group effect continues to remain insignificant after the inclusion of the debt ratio. To find out whether the marginal effect of debt on ROA is different for group affiliated firms, we interact, as in the pooled model, the debt ratio and the group dummy for both the below median and above median firms. Once we do so, we find a difference in the effect of the interaction term for the two sub-samples (Columns (iii) and (vi) of Table 7.1). While for the below median firms, the debt ratio continues to remain negative and significant after introducing the interaction term, the coefficient of the interaction term itself is insignificant indicating that there is no marginal effect for group affiliated firms. This result is in line with that obtained in the pooled model. For the above median firms, however, we find that the coefficient of the interaction term is negative and significant but the negative effect of debt ratio on ROA becomes insignificant once the interaction term is introduced.

With regard to the effect of debt ratio on Tobin's q in the two sub-samples, we find similar asymmetries in the group effect (Table 7.2). As in the case of ROA, we estimate the effect of diversification on Tobin's q after controlling for group effect but before introducing the debt ratio. For the above-median sample, as in the case of the pooled sample, there are no statistically significant effects of diversification after controlling for the group affiliation. In contrast, diversification has a negative and significant effect with respect to the below-median sample as the coefficient of n_act^2 is highly significant with a p-value of 0.0188. Further, while no group effect persists after controlling for diversification in the below-median sample, group effects remain positive and significant with a p-value of 0.0192 for the above-median sample.

Once we introduce the debt ratio to investigate the presence of propping, we find that debt has a positive and significant effect on Tobin's q for both below and above-median firms. However, once we introduce debt in the below-median firms, the coefficient of the group dummy which was insignificant earlier, turns significant with a negative sign. That is, after controlling for debt, group affiliated firms belonging to the below-median firms do worse as is evident from the negative and statistically significant coefficient (p-value of 0.0952) of the group dummy, whereas there was no significant difference in their performance vis-à-vis standalones when debt was not separately controlled for. This suggests that debt is a source of group benefits for below median firms and is instrumental in "propping" the market value of group affiliates to the same level as stand-alones. Once debt is separately accounted for, the benefits of group affiliation disappear and group affiliated firms are found to do worse than standalones (columns (i) and (ii) of Table 7.2). [14]

With regard to the above-median sample, group firms do better than standalones despite the negative effect of diversification, and these benefits while marginally accounted for by debt, continue to persist significantly with a p-value of 0.0274.

As in the case of ROA, we interact the group dummy with debt for both below and above median firms, but none turn out to be significant with respect to Tobin's q. The effect of debt ratio continues to be positive and significant in both the sub-samples independent of the inclusion of the interaction term.

Considering the results obtained with respect to ROA and Tobin's q for the two sub-samples, while it is found that the debt ratio explains the negative group effect that persisted with

[14] The argument that we are trying to make is the following. Suppose the group core firm gives its affiliate Rs.100 as debt and if we do not control for it, its benefit shows up in standalones and group affiliates being valued at par. However, if shareholders control for that Rs.100 in their calculations and factor out possible propping by the core, group affiliated firms are valued less in the market.

respect to ROA in below median firms after controlling for diversification, the debt ratio can be seen as acting as a propping mechanism for these group of firms with respect to Tobin's q. Thus, had debt ratio not been separately controlled for in the estimations for the below median sub-sample, group affiliates would have performed worse than standalones with respect to the current measure of performance, ROA, yet such differences would not have been reflected in any significant differences in market value between standalones and group affiliates. For the above median firms, while there is no significant difference in ROA between group affiliates and standalones irrespective of whether the debt ratio is controlled for, positive group effects continue with respect to Tobin's q despite the inclusion of debt.

Given the above, it may reasonably be concluded that the debt ratio plays a more critical role for the below median firms in explaining the source of group benefits and costs. The debt ratio while lowering current profitability of group affiliated firms vis-à-vis standalones, act as a leveler for the below median firms with respect to the forward looking market measure, Tobin's q, strongly suggesting the incidence of propping. While the positive effect of the debt ratio on market value and on group affiliation for the below median firms can be interpreted from an agency theoretic perspective of debt helping to ameliorate agency costs and align the incentives of managers and shareholders (Jensen, 1986), as FJM (2003) remark, high levels of debt that can induce greater effort by managers can be interpreted as a "non-cash variety of propping."

6.3 Additional Test for Propping

While our results with respect to Tobin's q, after incorporating debt ratio in the below median sample is strongly suggestive of propping, the results with respect to ROA do not directly suggest so. We investigate this apparent anomaly further by undertaking a more direct test of propping with respect to the ROA measure. While the basic idea of such a test is taken from the test of tunneling proposed in Bertrand *et. al.* (2002), our test is modified in light of our cross-section analysis. Time series data, as used in Bertrand *et al.*(2002) allows one to measure industry shocks and a firm's sensitivity to such shocks. This is not a meaningful concept with regard to cross-section data as such data will not capture any year to year variation in industry adjusted returns and therefore the sensitivity of a firm to changes in such returns.

Bertrand *et al.* (2002) argue that if the controlling shareholder tunnels, he will transfer profits from firms where he has low cash flow rights to firms where he has high cash flow rights. As a result, group firms will be more sensitive to shocks affecting low-cash-flow-right firms in their group than to shocks affecting high-cash-flow-right firms. The mirror image of this is that if the controlling shareholder engages in propping, there will be transfers from high-cash-flow-right

firms to low-cash-flow-right firms and thus group firms will be more sensitive to shocks affecting high-cash-flow-right firms than shocks affecting low-cash-flow-right firms. In other words, if propping exists, a group firm should benefit from the excess returns of firms high up in the pyramid rather than from firms low in the pyramid. If tunneling exists, one would expect just the reverse. This is because firms where promoter stakes are higher and are cash rich are likely to prop up firms where there is greater divergence between cash flow and control rights.

For each firm, we consider two measures. The first is the actual operating profits of firm *k* in industry *I*, $perf_{kI}$. Second, we compute the industry-adjusted return for this firm, $pred_{kI} = A_{kI} * r_I$ *where* r_I equals the asset weighted average returns for all firms in industry *I*. We now compute the difference between the actual profits $perf_{kI}$. *a*nd $pred_{kI}$. and regress this measure, *ret_diff*, on a host of firm specific variables. Our main interest is in finding out the extent to which the excess return of a firm belonging to a particular ownership group is "sensitive" to the excess returns earned by other firms in the group, and particularly, with respect to that earned by firms in the group higher up in the pyramid with higher promoter's share and to that earned by firms lower down in the pyramid with lower promoter's stake and hence with a greater divergence between cash flow and control rights. We use the median promoter ownership of group firms (used to create our sub-samples) to divide firms into those high in the pyramid and low in the pyramid.

To test our hypothesis, we run two sets of estimations on our sample of 910 group affiliated firms.[15] For this purpose, we construct our three variables of interest. The first, *o_ret_diff* is the sum of excess returns (as defined above for each firm) of all firms belonging to an ownership group excluding the firm in question. We find out whether the excess return earned by the k^{th} firm in the g^{th} group is sensitive to the excess returns earned by all other firms in the group.

We thus estimate the following relationships:

$$ret\_diff_{kg} = a + b(o\_ret\_diff_g) + c(firm\ controls) + + d(group\ covariates) + error$$

$$\text{where } o\_ret\_diff_g = \Sigma_{i \neq k}\ ret\_diff_{ig,} \quad i \in g \qquad \text{(Model 4)}$$

[15] We include in this sample, besides the 741 group affiliated listed firms in our sample, unlisted group affiliates to get a more complete picture of pyramidal ownership within a group.

A value of b > 0 will imply that the extent to which a group firm performs better over and above the industry adjusted return depends directly on the extent of excess returns earned by other group firms.

Second, we seek to find out whether there is any difference in the effect of the excess returns earned by other firms in the group depending on whether these firms are high cash flow right firms or low cash flow right firms *within a group*. Hence, we define h_ret_diff for any group as the sum of excess returns of firms (excluding the firm in question) with above median promoter ownership in that group. Similarly, we define l_ret_diff for any group, as the sum of excess returns of firms (excluding the firm in question) with below median promoter ownership in that group. In the specification below (Model 5), if the excess return of a firm is sensitive to other firms in its group, we will expect the coefficient of o_ret_diff to be significant. If firms with higher cash flow rights prop up firms with lower cash flow rights, we will expect the coefficient of h_ret_diff to be positive and significant and the coefficient of l_ret_diff to be insignificant. If on the other hand, tunneling prevails, then one would expect just the opposite effects to hold.

$$ret\_diff_{kg} = a + b_L\,(l\_ret\_diff_g) + b_H\,(h\_ret\_diff_g) + c(\text{firm controls}) + d(\text{group covariates}) + error \quad \text{(Model 5)}$$

where $l\_ret\_diff_g = \Sigma_{i \neq k}\ ret\_diff_{ig,}\ ,\ i \in g$ and $i \in$ firms with low cash flow rights.

$h\_ret\_diff_g = \Sigma_{i \neq k}\ ret\_diff_{ig,}\ ,\ i \in g$ and $i \in$ firms with high cash flow rights.

Also, $l\_ret\_diff_g + h\_ret\_diff_g = o\_ret\_diff_g$

Under propping, we would expect $b_H > b_L$ and under tunneling we would expect $b_H < b_L$

Among the firm level controls, we control for size, age and the debt ratio and among group level covariates, we control for group diversification and group size. The results of the estimations of Models (4) and (5) are presented in columns (i) and (ii) of Table 7.3. As is evident from Column (i) of the Table, the excess return of a group firm is positively affected by the excess returns earned by all other group firms taken together. Thus, the extent to which a group firm earns above industry adjusted returns is found to depend on the extent to which its cohorts in the group together earn such returns. Further, as column (ii) of Table 3 shows, the excess return of a firm is found to depend positively on firms within its group with higher than median promoter ownership, i.e., firms with high cash flow rights. Thus, if firms with high cash flow

rights earn excess returns, this is found to influence the industry-adjusted return of a group firm. The coefficient estimates suggest that when the excess returns of high cash flow rights firms within a group increases by rupee one, the excess return of a group firm increases by around 49 paise. On the other hand, such a spillover effect is absent with respect to firms with below median promoter ownership. We interpret this result as indicative of propping.

[Table 7.3 here]

Since the notion of propping essentially refers to activities entrepreneurs take to further the continued survival of poorly performing firms and therefore need not necessarily be related only to debt as a device to achieve this as in FJM's (2003) study, this test suggests a new approach to identify propping. In this sense, it adds to the robustness of our findings regarding propping with respect to Tobin's q described earlier in this section.

6.4. Managerial Integration

To examine the potential sources of positive group effects with respect to Tobin's q for the above median firms, we next consider whether managerial integration through interlocking among affiliated firms within a particular group could be the source of the persisting positive group effects. The rationale for including managerial integration within groups comes from the agency cost literature; greater interlocks enable better monitoring and hence can lead to higher market value.

To measure the extent of managerial integration at the group level, which we hypothesize could be a source of benefits for affiliated firms, we take into account the practice that group head offices often follow the practice of placing directors of the main company or the holding company of the group in the boards of its subsidiaries[16]. Such directorial interlocks between the main or core company and a subsidiary serve as a mechanism for monitoring and better communications, and the higher the extent of such interlocks, the more can a subsidiary be considered to be integrated within the group. To capture the extent to which a core company has managerial ties with its subsidiary, we define the core company within a group as the one with the highest proportion of group assets. We identify the directors of the board of this core company as well as the directors of the board of each subsidiary. We then match the identity of the directors of the board of the core company with that of each subsidiary in the group. Finally, we calculate

[16] Anecdotal evidence to this effect is found in Khanna and Palepu's (1999) study of Indian and Chilean business groups. The authors mention the case of a "dramatic attempt at strengthening group identity" by the Tata Group in India where one of the ways by which the Tata Group became a more "coherent" group was through increasing directorial overlaps across companies, with the CEO of the group acting as the CEO of several of the major group companies.

for each subsidiary the proportion of its company board accounted for by members of the core firm, which gives us our required measure of managerial integration for each firm within a group. The minimum value of the firm level interlock measure is zero and the maximum is one. The group level measure, group_interlock, which we use in our estimation is a weighted measure calculated as firm interlock weighted by the proportion of firm assets to total group assets, summed over all group firms. This is akin to the WDI discussed above wherein monitoring through the presence of core firm directors in group affiliates is given more importance for larger firms in the group as compared to the smaller ones.

Table 8 presents the regression estimates with regard to Tobin's q for the above median firms group_interlock. We first estimate the model by incorporating the promoter's share in order to examine whether concentrated ownership in the above median firms confers additional benefits to group affiliated firms and explain the persistence of positive group effects even after controlling for debt. The rationale for including for promoter's share comes from the corporate governance literature where concentrated ownership may lead to higher market value through better monitoring (Shleifer and Vishny, 1997). Second, we incorporate our managerial integration variable, group_interlock, to examine its effect on firm value after controlling for promoter's shareholding.

As is evident from Column (i) of Table 8, as expected, promoter's share has a positive and significant effect on Tobin's q, suggesting that more ownership concentration enables more effective monitoring. The effect of debt continues to be positive and significant, but the diversification effect, while being negative, is insignificant. Interestingly, benefits of group affiliation persist even after controlling for promoter's share. To explain the persisting group effect, we introduce our variable of interest, the measure of managerial integration, group_interlock. As Column (ii) of Table 8 shows, managerial integration has a positive and significant effect on Tobin's q and group effects become insignificant. This indicates that higher managerial integration between core firms and subsidiaries for firms where ownership concentration is higher is one of the key sources of higher market valuation for group affiliated firms relative to stand-alones.

[Table 8 here]

To check whether the positive effects of promoter's share and managerial integration on Tobin's q are necessarily confined to above median firms, we estimated the effect of these variables on Tobin's q for the below median firms also. None of the variables are statistically significant in explaining market value for the latter group of firms. Finally, for the sake of completeness of the analysis, we also estimated the effect of promoter's share and managerial

integration on ROA separately for the below median and above median firms. In the case of both sub-samples, neither variable is found to be statistically significant.

6.5 Control Variables

The inclusion of the debt ratio in our estimation largely preserves the results that we obtained with respect to the control variables when we considered only diversification as our variable of interest (Section 5.3). The earlier finding that size measured by the log of sales are associated with higher ROA holds once we include debt (Table 5) as also when we split the sample by below and above median promoter ownership (Tables 7.1 and 7.2). In the case of Tobin's q too, consistent with the earlier findings, size has no significant effect on market value. Further, older firms by and large perform consistently worse with respect to both ROA and Tobin's q. Finally, while group size continues to have no effect on ROA, by and large, it has a positive and significant effect on Tobin's q.

7. Conclusion

The industrial landscape of many emerging economies is characterized by business groups diversified across a wide range of activities. Given the well-known costs of diversification, their continued prevalence presents a puzzle that has not yet been satisfactorily resolved. The wide-ranging transformation of the Indian economy over the past decade presents a unique laboratory for studying the changing role of this organizational form.

We study the benefits of business group affiliation in the context of the Indian economy in 2001. Since India embarked upon the path of economic liberalization in 1991, and the first pioneering study of the benefits of business group affiliation (Khanna and Palepu, 2000a) was conducted in the context of 1993, this provides us with a window long enough to examine how the role of business groups has evolved since the beginning of the transition.

We find group affiliation is associated with poorer current accounting performance (Return on Assets) but better expected future performance (Tobins q). In contrast to the findings for 1993, diversification is no longer the source of group benefits. Firms affiliated with more focused groups do better both in terms of accounting profits and the market measure of performance. We therefore explore two alternative explanations which seem likely in the context of an emerging market such as India.

We first examine the possibility of "propping" (Friedman, Johnson Mitton, 2003) as measured by the debt-ratio of a firm as a possible explanation of the benefits displayed through Tobin's q. We find this variable completely absorbs the positive group effect. In order to

understand this better we split our sample of firms according to ownership concentration. For the sub-sample with low ownership concentration (below-median) there is no positive group effect with respect to Tobin's q; in fact the group effect becomes negative when we account for propping. But for firms with high ownership concentration (above-median) the positive group effect continues to persist. This suggests that the positive group effect with respect to Tobin's q in the full sample is being driven by the firms with high ownership concentration.

Our findings are strengthened by an alternative test for propping we devise that is in effect the mirror image of Bertrand et. al's (2002) methodology to detect tunneling in Indian business groups. We invert the logic of their test and argue that if the controlling shareholder engages in propping, there will be transfers from high-cash-flow-right firms to low-cash-flow-right firms and thus group firms will be more sensitive to shocks affecting high-cash-flow-right firms than shocks affecting low-cash-flow-right firms. We devise a version of this test that fits our sample and find strong evidence for this interpretation of propping on ROA.

In order to explain the persistence of group affiliation benefits in firms with high ownership concentration, we consider the possibility of monitoring and information flows proxied by interlocks at the level of the board of directors. We find that once we account for this kind of group level managerial integration the group effect is dissipated.

Thus, the positive effects of group affiliation accrue to firms with more ownership concentration belonging to less diversified, more interlocked and smaller groups. For firms with less ownership concentration, though firms belonging to more focused groups also perform better, group affiliated firms perform at par with stand-alones only when propped by debt.

Our results suggest considerable evolution in the source of group affiliation benefits over the Indian economic transition. The findings suggest that the benefits associated with business groups are accruing to a narrower set of firms and that the sources of such benefits are primarily non-diversification related. This could be because the institutional environment of India has evolved to the extent that the "institutional voids" that business groups bridged and augmented through diversification (Khanna and Palepu, 1999, 2000a, b) are no longer as critical. Yet one finds no noticeable decrease in the extent of group level diversification over the years. In fact, group diversification as measured by the number of activities in which a group is involved, has been found to increase on an average compared to the earlier level. Thus, the results pose another puzzle. If the performance benefits of diversified business groups are becoming attenuated, what drives the diversified structure of these organizations which are still ubiquitous in emerging markets? This is an important question for future research.

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Appendix 1

Description of Major Policy Reforms in the Indian Economy, 1990-2000

Financial Market Regulations:

Summary: Financial sector reforms are at the centre of stage of the economics liberalization that was initiated in India in mid 1991.

Exchange Control and Convertibility:

- Foreign Institutional Investors were allowed to invest in Indian equities subject to restrictions on maximum holdings in individual companies.
- In February 1992, the government began moves to make the rupee convertible, and in March 1993 a single floating exchange rate was implemented.
- Indian companies were allowed to raise equity in international markets subject to various restrictions.
- Indian mutual funds were allowed to invest a small portion of their assets abroad.
- Indian companies were given access to long dated forward contracts and to cross currency options.

Subsequently, the opening up of the economy to capital inflows helped to strengthen the balance of payments position.

Banking and credit policy:

- Capital base of the banks were strengthened by recapitalization, public equity issues and subordinated debt.
- New private sector banks were licensed and branch licensing restrictions were relaxed.
- Detailed regulations relating to Maximum Permissible Bank Finance were abolished.
- Credit delivery was shifted away from cash credit to loan method.

In the process, institutions have been exposed to competition from the banks who are able to mobilize deposits at lower cost.

Capital Markets:

- Regulations were framed and code of conduct laid down for merchant bankers, underwriters, mutual funds, bankers to public issues and other intermediaries.
- Entry norms for capital issues were tightened.
- In the area of corporate governance, regulations were framed for insider trading and regulatory framework for takeovers was revamped.

The major reform in the capital market was the abolition of capital issues controls and the introduction of free pricing of equity issues in 1992. Simultaneously the Securities and Exchange Board of India (SEBI) was set up as the apex regulator of the Indian capital markets.

Monetary policy and debt markets:

- The government reduced its pre-emption of bank funds and moved to market determined interest rates on its borrowings. Simultaneously, substantial deregulation of interest rates took place.
- Automatic monetization of the government's deficit by the central bank was limited and then eliminated by abolishing the system of ad hoc treasury bills.
- Opening up of the Indian debt market including government securities to Foreign Institutional Investors.
- Withdraw of tax deduction at source on interest from government securities and provision of tax benefits to individuals investing in them.
- Introduction of indexed bonds where the principle repayment would be indexed to the inflation rate.

Reforms have eliminated financial repression and created the pre-conditions for the development of an active debt market.

International Trade Environment

Exit Barriers:

- In a major policy shift, import licensing for all products—except those on the banned, restricted, and state monopoly lists—was abolished so that any item not on the lists could be freely imported.
- Maximum tariff rates were brought down in steps from 300 percent to about 40 percent for most products, and countervailing duties were reduced. The average trade-weighted tariffs were reduced from 87 percent in 1991 to 27 percent in 1997.
- Import duties are reduced for items needed by a processing industry if the processed products will be exported.
- Firms are permitted to set up private bonded warehouses in domestic tariff arrears to import, stock, and even sell restricted list items to holders of advance licenses.
- Export restrictions on most products have been lifted, and some commodities are provided subsidies allowed by the World Trade Organization on domestic transport and marketing costs.
- Agro-processing zones are being set up with government support for infrastructure and finance, as well as concessionary duties for imported inputs for exported products.

India introduced fundamental reform of domestic and trade policies in1991-1993. Trade reforms were aimed at eliminating restrictive licensing arrangements and reducing other quantitative restrictions on imports and exports, and substantially reducing basic tariffs.

Foreign Investment & Ownership

Incentives:

- **Automatic approval route and FIPB route**

  Foreign investment into India is governed by the Foreign Direct Investment policy of the Government of India and Foreign Exchange Management Act, 1999. There is no need to obtain prior approval of the Government of India for fresh investment to be made into an Indian company. This investment procedure is commonly known as the "automatic approval route".

  Foreign Investment Promotion Board (FIPB) of the government of India is constituted mainly to promote inflows of FDI into the country, as also to provide appropriate institutional arrangements, transparent procedures and guidelines for investment promotion and to consider and approve/recommend proposals for foreign investment.

- **State Level Project Implementation**

  Several state government have set up single window services (SWS) and investor escort services (ES). SWS aim at providing the investors a single point of contact to meet all regulatory requirements and get the required approvals. ES is targeted at large and medium size projects.

- **Power Tariff Incentives**

  Power tariff incentives are extended by state governments is different ways, such as exemption from the payment of electricity duty, freeze on the tariff charged for new units for a few years after commencement of production, assurance of uninterrupted electricity supply.

- **Other Incentives**

  Some states extend other incentives to small-scale units. Such incentives include concessional loans granted by State Financial Corporations, price preference on goods made by Small Scale Industries (SSIs) in purchases made by government, exemption from the payment of entry tax for a certain specified period.

- **Other modes of Foreign Direct Investments**

  Indian companies are allowed to raise equity capital in the market through the issue of Global Depository Receipts (GDRs) / American Deposit Receipts (ADRs) / Foreign Currency Convertible Bonds(FCCBs). These are not subject to any ceilings on investment and there is no restriction on the number of GDRs/ADRs/FCCBs to be floated by a company or a group of companies in a financial year.

  The Indian Government aims to eliminate the industrial licensing requirements except for certain select sectors, remove restrictions on investment and expansion and facilitate easy access to foreign technology and direct investment.

Ownership:

- After 1991, India increases ability of foreign firms to repatriate profits overseas, and removed bureaucratic red-tape associated with foreign equity ownership in domestic firms of up to 51%.

Competition Regulation

Competition Bill:

- The restriction of monopoly implied that no firm could expand beyond a certain limit of investments, and artificial efforts at raising prices or restricting supply in a market such a way so as to get a price above the one that the market would be prepared to pay under normal circumstances.
- The act judges anti-competitiveness of any company on the basis of its action, rather than simply by its potential to behave in that way.
- Combinations have been brought within the purview of the competition bill. Any person entering into any combination having specified financial implications must give notice of the same to the Competition Commission of India.

Competition Commission of India:

The hall mark of the Competition law is the establishment of the Competition Commission of India (CCI). The formation of CCI is necessary with the formulation of the law. The commission consists of people from various occupations, so that the commission is well versed with the nitty gritty of the business and able to discharge its duty properly.

The competition policy could be beneficial to the poor is by mitigating the adverse effect of strong intellectual property rights regime. Two sectors viz. pharmaceuticals and agriculture are very important in this regard.

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- **India: Trade** http://www.ers.usda.gov/Briefing/India/trade.htm
- **India: Policy** http://www.ers.usda.gov/Briefing/India/policy.htm

Foreign Investment & Ownership:

- **Investing in India**

http://meaindia.nic.in/indiapublication/investing%20in%20india.htm

Competition Regulation:

- **Contours of Competition Bill**

http://www.indiainfoline.com/nevi/coof.html

Table 1: Descriptive Statistics

	Mean		Median	
	Group Affiliates	Nongroup Firms	Group Affiliates	Nongroup firms
Number of firms in sample	741	1557	741	1557
Sales in (Rs. millions)	3957.10	358.80***	1270.00	103.50***
Assets (Rs. millions)	6044.90	562.50***	1666.20	164.50***
Age (years)	26.55	15.72***	19.00	12.00***
Debt ratio (%)	36.31	26.07***	37.52	23.61***
Promoter's share (%)	48.18	47.36	49.14	47.32
ROA (%)	4.23	1.86***	5.30	2.73***
Tobin's Q	0.64	0.61**	0.57	0.52**

*** denotes significance at the 1 per cent level.
** denotes significance at the 5 per cent level.

Table 2: Group Level Measures (listed and unlisted firms)

Group Measures	Mean	Median	Min	Max
Number of different industries in group: **n_act**	5.11	3.00	1.00	26
Herfindahl measure of diversification: **herf_ind**	0.64	0.60	0.14	1.00
Weighted measure of diversification: **WDI**	0.62	0.60	0	1.53
Weighted Group interlock: **group_interlock**	0.66	0.64	0	1
Average Number of firms in group: **n_firms**	11.3	5.00	2	96
Proportion of listed firms in group: **n_firms_list**	0.65	0.67	0.12	1.00

Table 3: The Effects of Group Diversification (Count Measure) and Group Size on Firm Performance

	Panel A: ROA			**Panel B: Tobin's Q**		
	Coefficient					
	Specification			Specification		
Variable	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Constant	-2.0887	-1.4327	-1.7122	0.5721	0.5732	0.5827
	(0.0174)	(0.1062)	(0.0550)	(<0.0001)	(<0.0001)	(<0.0001)
Log of Sales	1.8524	1.7773	1.8475	0.0065	0.0083	0.0051
	(<0.0001)	(<0.0001)	(<0.0001)	(0.2604)	(0.1228)	(0.3017)
Age	-0.0186	-0.0184	-0.0179	-0.0009	-0.0008	-0.0008
	(0.0382)	(0.0414)	(0.0471)	(0.0782)	(0.0934)	(0.0871)
Group Dummy	-1.8371		-1.4980	0.0560		0.0512
	(<0.0001)		(0.0083)	(0.0151)		(0.1026)
Number of industries (n_act)		-0.5727	-0.3406		-0.0029	-0.010
		(<0.0001)	(0.0355)		(0.6513)	(0.1591)
Number of industries squared (n_act^2)		0.0180	0.0014		-0.0013	-0.0007
		(0.0427)	(0.8850)		(0.0018)	(0.1115)
Number of firms in a group (n_firms)		0.0300	0.0947		0.0111	0.0089
		(0.6927)	(0.2150)		(0.0010)	(0.0089)
Industry dummies	(included)	(included)	(included)	(included)	(included)	(included)
Number of observations	2298	2298	2298	2298	2298	2298
F-statistic	11.94	11.35	11.28	2.98	2.87	2.87
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
R^2	0.19	0.19	0.19	0.06	0.06	0.06

p-values reported within brackets

Table 4 : The Effects of Group Diversification (Count Measure) on Accounting Measures of Performance of Group Affiliates

Variable	ROA		Tobin's Q	
	(i)	(ii)	(iii)	(iv)
Constant	-0.5430	0.4177	0.4741	0.4815
	(0.7915)	(0.8416)	(<0.0001)	(<0.0001)
Log of Sales	1.2473	1.2567	0.0406	0.0411
	(<0.0001)	(<0.0001)	(0.0002)	(0.0001)
Age	-0.0286	-0.0283	-0.0015	-0.0015
	(0.0302)	(0.0319)	(0.0324)	(0.0344)
Number of industries (n_act)	-0.2600	-0.2832	-0.013	-0.1525
	(0.1165)	(0.0871)	(0.0760)	(0.0436)
Number of industries squared	-0.0059		-0.0003	
(n_act^2)	(0.5581)		(0.4368)	
Number of firms in a group	0.1378	0.1022	0.0061	0.0040
(n_firms)	(0.0829)	(0.0228)	(0.0766)	(0.0976)
Industry dummies	(included)	(included)	(included)	(included)
Number of observations	741	741	741	741
F-statistic	3.45	3.54	1.37	1.41
	(<0.0001)	(<0.0001)	(0.0627)	(0.0528)
R^2	0.17	0.17	0.07	0.07

p-values reported within brackets

Table 5: The Effects of Propping on Firm Performance

	ROA		Tobin's q	
	(i)	(ii)	(iii)	(iv)
Constant	-1.7122	0.5631	0.5827	0.4393
	(0.0550)	(0.5410)	(<0.0001)	(<0.0001)
Log of Sales	1.8475	2.0826	0.0051	-0.0089
	(<0.0001)	(<0.0001)	(0.3017)	(0.1330)
Age	-0.0179	-0.0237	-0.0008	-0.0005
	(0.0471)	(0.0077)	(0.0871)	(0.3047)
Number of industries (n_act)	-0.3406	-0.0331	-0.0100	-0.0126
	(0.0355)	(0.0475)	(0.1591)	(0.0952)
Number of industries squared	0.0014	0.0011	-0.0007	-0.0006
(n_act^2)	(0.8850)	(0.9073)	(0.1115)	(0.2042)
Number of firms in a group	0.0947	0.0941	0.0089	0.0089
(n_firms)	(0.2150)	(0.2015)	(0.0089)	(0.0095)
Group dummy	-1.4980	-1.3740	0.0512	0.0434
	(0.0083)	(0.0147)	(0.1026)	(0.1641)
Debt_ratio		-0.0756		0.0048
		(<0.0001)		(<0.0001)
Industry dummies	(included)	(included)	(included)	(included)
Number of observations	2298	2298	2298	2298
F-statistic	11.28	12.76	2.87	4.87
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
R^2	0.19	0.21	0.06	0.09

p-values reported within brackets

Table 6: Summary Statistics for Sub-Samples

	Below Median			Above Median		
	Group firms (i)	Stand Alones (ii)	All (iii)	Group Firms (iv)	Stand Alones (v)	All (vi)
Number of firms	341	553	894	366	529	895
Sales in (Rs. millions)	5957.00	293.20***	2453.50	2401.90	519.70***	289.4^^^
Assets (Rs. millions)	9395.10	540.60***	3918.00	3323.00	521.80***	1667.30^^^
Debt ratio (%)	36.91	24.16***	29.03	35.53	27.16***	30.58
Promoter's share (%)	32.09	31.81	31.91	63.17	63.63	63.44^^^
Group interlock	0.65	0***	0.25	0.66	0***	0.27
ROA	3.83	1.48***	2.38	5.20	3.91***	4.44^^^
Tobin's Q	0.60	0.60	0.60	0.67	0.60***	0.63^^^

*** denotes significance at the 1 per cent level.
** denotes significance at the 5 per cent
^^^denotes significance level at the 1 per cent level when comparing the overall means of below median and above median firms (columns iii and vi).

Table 7.1: Effect of Debt Ratio on Profitability : Below Median and Above Median Promoter Ownership

	Below Median Promoter Ownership			Above Median Promoter Ownership		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Constant	-1.2683	1.6857	1.4913	-1.0825	0.0854	-0.9579
	(0.3749)	(0.2561)	(0.3346)	(0.4627)	(0.9543)	(0.5181)
Log of Sales	1.7558	2.0395	2.0324	1.5628	1.6959	1.6749
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
Age	-0.0367	-0.0384	-0.0384	-0.0065	-0.0119	-0.0124
	(0.0363)	(0.0273)	(0.0274)	(0.4769)	(0.1824)	(0.1508)
Number of industries (n_act)	-0.4645	-0.4384	-0.4279	-0.4076	-0.3908	-0.3751
	(0.0332)	(0.0427)	(0.0447)	(0.0404)	(0.0458)	(0.0528)
Number of industries squared	-0.0037	-0.0037	-0.0044	-0.0179	0.0153	0.0101
(n_act^2)	(0.8066)	(0.8027)	(0.7643)	(0.1275)	(0.1789)	(0.3656)
Number of firms in a group	0.1615	0.1424	0.1442	0.0082	0.0163	0.4159
(n_firms)	(0.1719)	(0.2190)	(0.2113)	(0.9259)	(0.8495)	(0.6215)
Group dummy	-1.4874	-1.3909	-0.7851	-0.9074	-0.8411	1.4224
	(0.0937)	(0.1137)	(0.5719)	(0.2108)	(0.2439)	(0.2885)
Debt_ratio		-0.0882	-0.0810		-0.0410	-0.0122
		(<0.0001)	(0.0001)		(0.0035)	(0.5447)
Debt*group			-0.0189			-0.0700
			(0.5027)			(0.0105)
Industry dummies	(included)	(included)	(included)	(included)	(included)	(included)
Number of observations	894	894	894	895	895	895
F-statistic	5.40	6.09	5.97	4.18	4.33	4.46
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
R^2	0.23	0.25	0.25	0.18	0.19	0.20

p-values reported within brackets

Table 7.2: Effect of Debt Ratio on Tobin's Q :
Below Median and Above Median Promoter Ownership

	Below Median Promoter Ownership			**Above Median Promoter Ownership**		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Constant	0.5626	0.4094	0.4163	0.5609	0.4784	0.4713
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
Log of Sales	0.0137	-0.0010	-0.0007	0.0057	-0.0053	-0.0055
	(0.1119)	(0.9134)	(0.9345)	(0.6111)	(0.6358)	(0.6230)
Age	0.0006	0.0007	0.0007	-0.0022	-0.0017	-0.0017
	(0.4813)	(0.4189)	(0.4190)	(0.0003)	(0.0036)	(0.0037)
Number of industries (n_act)	-0.0067	-0.0080	-0.0084	-0.0063	-0.0077	-0.0076
	(0.4832)	(0.3936)	(0.3605)	(0.5642)	(0.4673)	(0.4766)
Number of industries squared	-0.0016	-0.0016	-0.0015	-0.0006	-0.0004	-0.0004
(n_act^2)	(0.0188)	(0.0191)	(0.0214)	(0.3762)	(0.5744)	(0.5361)
Number of firms in a group	0.0145	0.0155	0.0155	0.0050	0.0044	0.0046
(n_firms)	(0.0012)	(0.0006)	(0.0154)	(0.3438)	(0.4110)	(0.3883)
Group dummy	-0.0572	-0.0622	-0.0836	0.0927	0.0873	0.1058
	(0.1342)	(0.0952)	(0.2137)	(0.0192)	(0.0274)	(0.2174)
Debt_ratio		0.0046	0.0043		0.0034	0.0036
		(<0.0001)	(<0.0001)		(<0.0001)	(<0.0001)
Debt*group			0.0006			-0.0006
			(0.6139)			(0.7410)
Industry dummies	(included)	(included)	(included)	(included)	(included)	(included)
Number of observations	894	894	894	894	894	894
F-statistic	2.98	3.80	3.73	1.79	2.23	2.18
	(<0.0001)	(<0.0001)	(<0.0001)	(0.0012)	(<0.0001)	(<0.0001)
R^2	0.14	0.17	0.17	0.09	0.11	0.11

p-values reported within brackets

Table 7.3 : Sensitivity of Excess Returns of Group Firms to Group and Sub-Group Excess Returns

	(i)	(ii)
Constant	-12.5758	-14.3378
	(0.3929)	(0.3182)
o_ret_diff	0.0735	
	(0.0753)	
l_ret_diff		-0.1615
		(0.2021)
h_ret_diff		0.4859
		(0.0807)
Log of Sales	6.7173	7.7431
	(0.0150)	(0.0059)
Age	-0.0281	-0.0586
	(0.8160)	(0.6007)
Number of industries (n_act)	0.2468	-3.1621
	(0.9333)	(0.2197)
Number of industries squared (n_act^2)	-0.2078	-0.1813
	(0.1497)	(0.1130)
Number of firms in a group (n_firms)	1.1476	2.5357
	(0.1483)	(0.0238)
Debt_ratio	-0.2858	-0.2465
	(<0.0001)	(0.0016)
Industry dummies	(included)	(included)
Number of observations	910	910
F-statistic	2.79	6.75
	(<0.0001)	(<0.0001)
R^2	0.12	0.25

p-values reported within brackets

Table 8 : Sources of Market Value of Group Affiliates with Above Median Promoter Ownership:
Effect of Promoter Ownership and Managerial Integration on Tobin's Q

Variable	(i)	(ii)
Constant	0.0798	0.0621
	(0.4839)	(0.5922)
Log of Sales	-0.0024	-0.0033
	(0.8307)	(0.7654)
Age	-0.0020	-0.0020
	(0.0010)	(0.0012)
Number of industries (n_act)	-0.0108	0.0003
	(0.2940)	(0.9773)
Number of industries squared (n_act^2)	-0.0003	-0.0011
	(0.6156)	(0.0787)
Number of firms in a group (n_firms)	0.0052	0.0095
	(0.3253)	(0.0541)
Group dummy	0.0877	-0.1498
	(0.0251)	(0.1463)
Debt_ratio	0.0033	0.0034
	(<0.0001)	(<0.0001)
Prom_share	0.0062	0.0061
	(<0.0001)	(<0.0001)
Group_interlock		0.2909
		(0.0253)
Industry dummies	(included)	(included)
Number of observations	894	894
F-statistic	2.82	2.86
	(<0.0001)	(<0.0001)
R^2	0.11	0.14

p-values reported within brackets