

# Does Ownership Structure Influence Firm Value?

## Evidence from India

Jayesh Kumar\*

*Indira Gandhi Institute of Development Research,*

*Gen. A. K. Vaidya Marg, Goregaon (East), Mumbai 400 065, India.*

*Tel: +9198 1941 4866, Fax: +9122 2840 2752, E-mail : jayesh@igidr.ac.in.*

### Abstract

This paper examines the effect of ownership structure on the firm performance for an unbalanced panel of 2478 Indian corporate firms from 1994 to 2000. We examine the effect of interactions between corporate, foreign, institutional, and managerial ownership on firm performance. Using panel data framework, we show that a large fraction of cross-sectional variation, in firm performance can be explained by unobserved firm heterogeneity. We provide evidence that the shareholding by institutional investors and managers affect firm performance non-linearly, after controlling for observed firm characteristics and unobserved firm heterogeneity. We also find that the equity ownership by foreign and corporate shareholders do not influence firm performance. We find no evidence in favor of endogeneity of ownership structure.

*JEL Classification:* G32; G34.

*Keywords:* Corporate Governance, Ownership Structure, Firm performance, Panel Data, India.

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### ABSTRACT

This paper examines the effect of ownership structure on the firm performance for an unbalanced panel of 2478 Indian corporate firms from 1994 to 2000. We examine the effect of interactions between corporate, foreign, institutional, and managerial ownership on firm performance. Using panel data framework, we show that a large fraction of cross-sectional variation, in firm performance can be explained by unobserved firm heterogeneity. We provide evidence that the shareholding by institutional investors and managers affect firm performance non-linearly, after controlling for observed firm characteristics and unobserved firm heterogeneity. We also find that the equity ownership by foreign and corporate shareholders do not influence firm performance. We find no evidence in favor of endogeneity of ownership structure.

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In this paper, we examine whether differences in ownership structure across firms can explain their performance differences in an emerging economy like India. Using detailed ownership structure of 2478 Indian corporate firms over the period 1994-2000, we provide answer to some of the questions raised herewith. Does ownership matter? If it does, then, whether government ownership is more effective than private (including foreign) ownership in maximizing firm value? Does the identity of shareholder matter? What is the comparative efficiency of several forms of ownership structure? What is the preferred ownership structure for privately held firms? Should unobserved firm heterogeneity be controlled while analyzing the effect of ownership structure on firm performance? Is ownership structure really endogenous? Can ownership be a tool to control agency cost?

These are some of the important questions, which researchers are trying to explore in the recent literature of corporate finance. In this context, we investigate Indian corporate firms in order to provide new evidence on how ownership structure influence firm value.

Corporate Governance is the system of control mechanisms, through which “*the supplier of finance to corporations assure themselves of getting a return on their investment,*” (Shleifer and Vishny (1997)). The classical problem of corporate governance lies within the separation of ownership and control, i.e. the agency cost resulting from a divergence of interest between the owners and the managers of the firm (Jensen and Meckling (1976)).

Researchers have extensively studied the conflict between managers and owners regarding the functioning of the firm, although, the research on understanding the differences in behavior of different shareholder identities is limited. Berle and Means (1932) indicates that with an increase in professionalism of management, firms might be operating for the manager’s benefit rather than that of the owners. The principal-agent framework is used by Jensen and Meckling (1976) to explain the conflict of interests between managers and shareholders. The agency problem (developed by Coase (1960), Jensen and Meckling (1976) and Fama and Jensen (1983)) is an essential part of the contractual view of the firm. A rich empirical literature has investigated the efficacy of alternative mechanisms in terms of the relationship between

takeovers, performance, managerial pay structure and performance of the firm. A rather small literature has attempted to test directly Berle and Means hypothesis. The empirical evidence on this point is mixed. Morck, Shleifer, and Vishny (1988), McConnell and Servaes (1990) provided evidence in favor of significant effect of managerial and institutional shareholding on firm performance. However, Demsetz and Lenn (1985) find no relation between ownership structure and firm performance. Recently a growing amount of empirical work has been done for emerging economies including India: Majumdar (1998), Chibber and Majumdar (1999), Khanna and Palepu (2000), Sarkar and Sarkar (2000), Qi, Wu, and Zhang (2000), Claessens, Djankov, and Lang (2000), Wiwattanakantang (2001) and Patibandla (2002). Claessens and Fan (2003) provide an excellent survey on Corporate Governance in Asia.

The relationship between ownership structure and firm performance can also be evaluated by examining firm performance with change in ownership structure over the years. Himmelberg, Hubbard, and Palia (1999) use panel data structure in their analysis and conclude that changes in managerial ownership do not affect firm performance. They did not find any evidence for the relationship between firm value and managerial stock-holdings except after controlling for unobserved firm heterogeneity, and thus concluded that managerial shareholding are optimally chosen over the long run. Chen, Guo, and Mande (2003) document that managerial shareholding has a linear significant impact on Japanese firm performance, even after controlling for firm fixed effects. However they find that the fixed effect is significant.

Our work continues along these lines of enquiry. It examines the link between firm performance and ownership structure for a panel of 2478 publicly traded Indian corporate firms over the years 1994 to 2000. We have contributed in three ways to the existing literature. First, we employ an econometric framework that specifically controls for firm specific unobserved heterogeneity and aggregate macroeconomic shocks. Our econometric methodology allows us to control for the unobserved firm heterogeneity caused by the ownership structure and other observed variables separately as well as jointly. This approach also provides an opportunity to examine the significance of firm fixed effect. Secondly, this is the very first study in case

of India, which examines the effect of ownership structure on firm performance using a fixed-effect estimation technique to control for unobserved firm heterogeneity. Thirdly, it uses exact shareholding by different groups of owners, controlling for change in firm value due to small change in shareholding pattern (not exactly changing the dominance of a group), as in most of the cases shareholders dominance does not change dramatically. We also provide the evidence that the ownership structure does change significantly over time in case of emerging economy, India. We document that institutional shareholders including the government (institutional) and in some cases directors are the group of owners, which influence firm performance significantly after controlling for firm specific fixed effects and some observed firm-specific factors that may also influence firm's economic performance. We however do not find evidence in favor of ownership effect on firm performance in case of foreign and corporate shareholders.

Our paper now proceeds as follows: Section I briefly reviews the existing literature. Data, institutional details and variable constructions are presented in Section II. The methodology used and the obtained results are presented in Section III. Finally, some concluding remarks are presented in Section IV .

## **I. Literature Review**

The nature of relation between the ownership structure and firm performance, have been the core issue in the corporate governance literature. From a firms' point of view, firms' profitability, enjoyed by agents, is affected by ownership structure. In particular, ownership structure is an incentive device for reducing the agency costs associated with the separation of ownership and management, which can be used to protect property rights of the firm (Barbosa and Louri (2002)).

The theoretical literature on corporate governance proposes six main different mechanisms to control the agency costs. i.e. *Ownership Structure* : Jensen and Meckling (1976) and Shleifer and Vishny (1986), *Capital Structure and Board Structure* : Jensen (1986), *Manage-*

*rial Remuneration* : Jensen and Mourphy (1990), *Product Market Competition* : Hart (1983), *Takeover Market* : Fama and Jensen (1983), Jensen and Warner (1988) <sup>1</sup>.

While theoretical analysis of corporate governance deliver counteracting mechanisms of control, the empirical literature sheds light on the role of these counteracting mechanisms, suggesting firm value is an outcome of these mechanisms. As large share holdings are common in the world, except the US and the UK (Porta, Lopez-De-Silanes, and Shleifer (1999)), it is argued that large share-holders' incentive and ability to collect information and to monitor management reduces agency costs (Shleifer and Vishny (1986)).<sup>2</sup> Most of the works in literature have evolved against the backdrop of capitalist economies and very little is known (empirically) about such issues in emerging market economies, specially for India.

In the literature, along with agency cost approach, some other mechanisms are also proposed to explain the differences (relationship) in ownership structure and firm performance. In general, agency theory is used to analyze the relationship between principals and agents. But there is an increasing need to understand the conflict between the different classes of principals. As some owners might have different incentives/strategies to monitor. They may also have better know-how of the market resulting in increased firm performance. The different class of owners may have different 'network effect', for example: group vs. stand-alone firms. There may be 'spillover effect' resulting from diversified owners. Some owners can have holdings in firms that provide inputs for other firms at lower cost than the market, reducing the costs incurred for the 'middle man'.

If complete contracts could be written and enforced, ownership structure should not be a matter of concern (Coase (1960), Hart (1983)). In general, public sector firms are argued to be less efficient than private sector firms (in relatively competitive markets) due to low-powered managerial incentives and interest alignment. There could be "political" reasons, as government pursues multiple objectives, some of which, unlike profit maximization, are hard

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<sup>1</sup>For a detailed survey see Shleifer and Vishny (1997) and Megginson and Netter (2001).

<sup>2</sup>For a survey of empirical studies on the impact of ownership structure on corporate performance (see Short (1994)).

to be contracted upon. Ownership structure in such cases can make a difference in terms of firms' performance.

In 1990s, with the onset of liberalization process, the monitoring of corporations became one of the important issues addressed in corporate governance literature in India. Majumdar (1998), using industry level survey data for 1973-89, compared performance of state-owned enterprises, mixed-enterprises, and private corporations. They find that the enterprises owned by the central government and state government are less efficient than mixed or private sector enterprises, while mixed enterprises are less efficient than those in the private sector. Chibber and Majumdar (1999) examine the influence of foreign ownership on performance of firms operating in India using accounting measures of performance in cross sectional data analysis. Rather than capturing ownership variation through looking at categories such as domestic versus state ownership or joint ventures versus solely owned subsidiaries, they look only at ownership variations that have a legal basis in Indian Companies Act of 1956. They find foreign ownership to have a positive and significant influence on firm performance, but it does so, only when it crosses a certain threshold limit, which is defined by the property rights regime.

Sarkar and Sarkar (2000), using firm level balance sheet data for 1995-96, provide evidence on the role of large shareholders in monitoring firm value (Market to Book Value Ratio). They find that block-holdings by directors' increases firm value after a certain level of holdings. However, they do not obtain any evidence of active governance from institutional investors. They also highlight that foreign equity ownership has a beneficial effect on company value. By adopting a spline methodology,<sup>3</sup> they documented that for each type of large shareholder, the incentives for monitoring, changes significantly when ownership stakes rise beyond a particular threshold. The use of Market to Book Value Ratio, as a performance measure may not be desirable in analyzing such case, as the denominator does not include the investments a firm may have made in its intangible assets. If a firm has a higher ratio of its

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<sup>3</sup>They have found that linear specification is not able to detect any evidence in favor of relationship between firm performance and ownership structure.

investment in the total assets as in intangibles, and if the monitoring of intangible assets is more difficult, then the stake-holders are likely to require a higher fraction of managerial ownership to align the incentives. The firm with higher level on intangible assets will also have a higher performance (measured as a ratio of market value to book value), since the numerator will impound the present value of the cash flows generated by the intangible assets, but the denominator, under current accounting conventions (where book value of assets and debt are reported rather than the current value of assets and debt), will not include replacement cost of these intangible assets. These intangible assets will generate a positive correlation between ownership variables and performance, but this relation is spurious not causal. The market moods may also affect this measure. As for measurement of the market value researcher uses last trading days, closing price for the year, which may be different than the actual value. As during the end of financial year stock market gets more volatile due to certain other factors such as Budget announcement, which may have nothing to do with the specific firm.

Khanna and Palepu (2000), using business group level Indian data from 1993, find that firm performance initially declines with group diversification and subsequently increase once group diversification exceeds a certain level. Patibandla (2002), using firm level data from 1989 to 1999, show that foreign ownership is positively related with the firm performance, without accounting for unobserved firm heterogeneity.

Douma, George, and Kabir (2003), examine how ownership structure, namely the differential role played by foreign individual investors and foreign corporate shareholders affect the firm performance, using Indian firm level data for 2002. They find foreign corporations attribute to positive effect on firm performance. They also document positive influence of domestic corporate shareholding on firm performance. However, all the above-mentioned studies have tried to look into the question using a cross-section of data except Patibandla (2002), which uses firm level panel data for 11 industries chosen for the noticeable level of foreign equity presence in the industries. The study uses industry dummies in a Pooled OLS framework, to capture the fixed effects of the panel data. The study uses only one ownership

variable at a time in the regression analysis to avoid multicollinearity, which may fail to detect any interaction effect between two groups of owners. He uses only one group of owners in regression analysis at a time and argues that using all the six major groups of owners may lead to problem of multicollinearity, as the six major group of owners account for 100% of shareholding. However, the problem of multicollinearity may be taken care of by using four major group of owners in the regression study, which does not necessarily add to 100%.

Our study differs from the above mentioned study in the following aspects: first we try to utilize the panel structure of our data accounting for unobserved firm heterogeneity and provide evidence that unobserved firm heterogeneity does exist. Second, we also model the endogeneity that may exist in terms of ownership variables. Finally, we use an extensive set of empirical specifications to examine the relationship between ownership structure and firms' performance. Hence, the obtained results are more robust than the earlier studies have documented.

## **II. Data and Institutional Details**

### **A. Data sources and Sample selection**

For our study of effects of ownership structure (shareholding pattern) on firm performance, in emerging economy, we focus our attention on Indian corporate sector. We choose this as an experimental setting since Indian corporate sector offers the following advantages over other emerging market economies. The Indian Corporate Sector has large number of corporate firms, lending itself to large sample statistical analysis. It is large by emerging market standards and the contribution of the industrial and manufacturing sectors (value added) is close to that in several advanced economies (Khanna and Palepu (2000)). Unlike several other emerging markets, firms in India, typically maintain their shareholding pattern over the period of study (Patibandla (2002)), making it possible to identify the ownership affiliation of each

sample firm with clarity. It is by and large a hybrid of the “*outsider systems*”<sup>4</sup> and the “*insider systems*”<sup>5</sup> of corporate governance (Sarkar and Sarkar (2000)). The legal framework for all corporate activities including governance and administration of companies, disclosures, share-holders rights, has been in place since the enactment of the Companies Act in 1956 and has been fairly stable. The listing agreement of stock exchanges have also been prescribing on-going conditions and continuous obligations for companies.<sup>6</sup> India has had a well established regulatory framework for more than four decades, which forms the foundation of the corporate governance system in India. Numerous initiatives have been taken by Securities Exchange Board of India (SEBI) to enhance corporate governance practice, in fulfillment of the twin objectives: investor protection and market development, for example: streamlining of the disclosure, investor protection guidelines, book building, entry norms, listing agreement, preferential allotment disclosures and lot more. Although the Indian Corporate Sector is a mix of government and private firms (which are again a mix of firms owned by business groups and multinational firms, and stand alone firms), it has not suffered from the cronyism that has dominated some of the developing economies. Accounting system in India is well established and accounting standards are similar to those followed in most of the advanced economies (Khanna and Palepu (2000)).

This increases our confidence in the reliability of our data. The firm level panel data for our study is primarily obtained from the corporate database PROWESS maintained by CMIE, the Center for Monitoring the Indian Economy. The data used in the analysis consists of all manufacturing firms listed on the Bombay Stock Exchange (BSE), for which we could get their historical share holding pattern. Public Sector firms are not included in the analysis as their performance is influenced by a large number of social obligations, which may be difficult to account for. Firms within financial services segments are removed from consideration.

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<sup>4</sup>Where the management of the firm have nil or minimal shareholding.

<sup>5</sup>Management of the firm have significant shareholding.

<sup>6</sup>For more discussion on this see Kar (2001), pg. 249.

We confine our analysis to BSE listed firms only because all the listed firms are required to follow the norms set by SEBI for announcing the financial accounts. The BSE also has the second largest number of domestic quoted companies on any stock exchange in the world after NYSE, and more quoted companies than either the London or the Tokyo stock exchange.

We analyze data from 1994 to 2000.<sup>7</sup> We also restrict our analysis to firms which have no missing data (on sales, age, ownership structure, return and assets) for at least 2 consecutive years.<sup>8</sup> There are 2575 firms (5224 firm years) in our sample, for which there is data required for at least 2 consecutive years.<sup>9</sup> For this unbalanced panel of 5,224 observations, we collect the following additional data for each firm observation: advertising, distribution, depreciation, marketing, imports, exports, excise, capital and research and development (R&D) expenditure. Despite the problem of attrition and missing data, our sample provides several distinct advantages over the samples used in earlier studies. We perform our analysis after restricting the performance measure to lie between 1<sup>st</sup> and 99<sup>th</sup> percentile to tackle the problem of outliers, which may be influential.<sup>10</sup> This leaves us with 5017 observations for 2478 firms.

## B. Key Variables

We include four ownership variables: the managerial shareholding (director),<sup>11</sup> institutional investors shareholding (institutional), foreign investors shareholding (foreign), and corporate shareholding (corporate) and their squares to examine the presence of ownership effect. The squares of the ownership variables are included to distinguish the change in their effect after a

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<sup>7</sup>We could not use data beyond year 2000, as the definitions of the ownership variables underwent a dramatic change following the new disclosure pattern since March 2001 according to SEBI circulation (Circulation number SMDRP/POLICY/CIR-7/01) on February 1, 2001 to amend the Clause 35 of the Listing Agreement. The details of this change is available on request.

<sup>8</sup>We can not avoid these conditioning because we can not use firms with observations less than two continuous years of data in our methodology.

<sup>9</sup>We drop observations, where values reported for capital stock, sales and age are missing, zero or negative.

<sup>10</sup>We have also used a formal procedure (DFFITS Statistics) suggested by Belsley, Kuh, and Welsch (1980) to identify influential observations.

<sup>11</sup>A number of studies, for example, Morck et al. (1988) have used board of directors' equity holdings as a proxy for managerial ownership.

certain threshold. Year dummies are also included to control for contemporaneous macroeconomic shocks. We use accounting measure of performance such as Return on Assets (ROA) and Return on equity (ROE).

It is argued in the literature that the accounting measures do not take into account the future prospects of firm performance, whereas market values can be observed currently and that it reflects the information of market agents as well as their judgment about the firm's future prospects. Market value can serve the purpose under the assumption that the market is informationally efficient in a strict sense. Unfortunately this is not the case. If management has more information than the shareholders and other investors, then this information will not necessarily be contained in the market price. As the market reacts to the new information, better informed agent can use their knowledge to influence market value. If we object to accounting profit as a measure of performance that it can be manipulated by management, we must not overlook that the same is true for market value. Moreover, the high volatility of the stock-market prices gives reason to doubt the informational efficiency of the market. The share market measures of firm performance may also run into such problems, especially in emerging market context, as most of the firms, go for debt-financing in these economies rather than using finance from the share market. Therefore, share market measures do not reflect the actual profits made by the investors on their investments. However, as a robustness check, we also use some market based measures: such as Market to Book Value Ratio (MBVR) and proxy for Tobin's average Q Ratio (PQ\_A).<sup>12</sup>

### **C. Control Variables**

In order to control for the other possible determinants of firm performance not captured by the ownership variables, we also include some observed firm characteristics as control variables. The control variables used in the study have been selected with reference to those employed in earlier empirical studies (for example: Himmelberg et al. (1999)). We use age, size (as

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<sup>12</sup>See Table 1 for description of the variables.

measured by the logarithm of sales) and its square, export intensity, import intensity, advertising intensity, R&D intensity, distribution intensity, marketing intensity, tax intensity, capital intensity and debt intensity as the control variables. We also try to provide a brief justification for these sets of control variables below, and in Table 1 we provide list of the variables used in the study with their definitions (construction).

*Size:* Firm size has an ambiguous effect a priori on the firm performance. Larger firms can be less efficient than smaller ones because of the loss of control by top managers over strategic and operational activities within the firm (Himmelberg et al. (1999), Sarkar and Sarkar (2000)). Lang and Stulz (1994) suggests a decrease in firm value as firm becomes larger and more diversified. On the other hand, large firms may turn out to be more efficient as they are likely to exploit economies of scale, employ more skilled managers and the formalization of procedures that may lead to better performance. It also measures a firm's market power or the level of concentration in the industries in which the firm operates. Such characteristics make the implementation of operations more effective, allowing large firms to generate greater returns on assets and sales as well as to capture more value as a proportion of the value of the production, leading to a higher firm performance. We use the logarithm of sales ( $\ln Sale$ ), and its square ( $\ln Sale^2$ ), to control for firm size.

*Age:* Age of the firm has an ambiguous effect a priori on firm performance. As older firms gain experience-based economies of scale based on learning, they can enjoy superior performance compared to new comers and can avoid the liabilities of newness. However, older firms are prone to inertia, and rigidities in adaptability, which may lead to lower performance. We measure age as the number of years since inception to the date of observation.

*Capital Intensity:* Firms with higher concentration on "hard" capital <sup>13</sup> in their inputs will have better performance. The firms operating with higher capital-to-sales ratio impose entry barrier and enjoy better control over the market, than it would have been otherwise. We use

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<sup>13</sup>"Hard" capital refers to installed capital.

the firms' capital-to-sales ratio as a measure of the relative importance of hard capital in the firm's technology.

*R&D Intensity, Advertising Intensity, Distribution Intensity and Marketing Intensity:* These expenditures of a firm may yield positive returns in future, improving firm performance. These variables also control for opportunities of discretionary expenditure by management. It is measured as ratio of respective expenditures to sales. These variables are used to control the operational aspects, based on empirical performance studies and literature reviewed in (Cui and Mak (2002)).

*Export Intensity:* Exposure to foreign trade exerts pressure on firms to attain superior performance, lower cost and improved quality, and thereby raising competitive intensity and reducing inefficiencies in firms (Chibber and Majumdar (1999)). We use exports to sales ratio as a measure of export intensity.

*Import Intensity:* Firms with higher level of imported capital in their capital structure may outperform firms with lower share of imported capital goods. We use imports to sales ratio as a measure of import intensity.

*Tax Intensity:* Firms with higher level of net output will be required to pay higher excise tax. This suggests that the tax Intensity would be higher for the firms with higher output level. Due to unavailability of data on actual tax paid, we measure tax Intensity, by the provisions made for the payment of taxes.

*Debt Intensity:* For the firms with higher level of debt, cost of capital would be higher. In such scenario firm will have to perform better than it would have been otherwise. We measure debt Intensity as the ratio of long-term borrowings to total assets.

### III. Empirical Analysis

This section is divided in five sub-sections: sub-section 1 presents the empirical model. The descriptive statistics are presented in sub-section 2. Sub-section 3 presents the regression results. The result from our robustness exercise is being reported in sub-section 4, while sub-section 5 deals with the endogeneity issues regarding the ownership variables. Finally in sub-section 6, we examine the relationship between dominant group shareholding and firm performance.

#### A. Empirical Model

Himmelberg et al. (1999) have argued that regression of firm performance on ownership variables is potentially misspecified because of the presence of the firm heterogeneity. Specifically, if some of the unobserved determinants of firm performance are also determinants of ownership, then ownership might spuriously appear to be a determinant of firm performance. Zhou (2001) have argued that the firm-fixed effects is not necessary in terms of ownership, as the ownership structure in general does not vary over time for a specific firm. We provided an explicit test to justify the inclusion of firm-fixed effects in both forms, namely, in terms of our control variables as well as in terms of ownership structures. This leads us to the estimation of the following equation:

$$\begin{aligned} Performance_{it} = f ( & Foreign_{it}, Institutional_{it}, Corporate_{it}, Director_{it}, lnSale_{it}, Age_{it}, \\ & Debt Int_{.it}, Exp.Int_{.it}, Imp.Int_{.it}, R\&DInt_{.it}, Adv.Int_{.it}, Dis.Int_{.it}, \\ & Cap.Int_{.it}, Mkt.Int_{.it} ) + \delta_i + \gamma_t + \varepsilon_{it} \end{aligned} \quad (1)$$

where  $i$  and  $t$  represent the firm and periods, respectively,  $\delta_i$  is the firm-specific effect, and  $\varepsilon_{it}$  is the error term.

$$Performance_{it} = \alpha + \beta(Ownership)_{it} + \gamma X_{it} + \theta_t + \delta_{i1}(\overline{Ownership})_i + \delta_{i2}\bar{X}_i + \varepsilon_{it} \quad (2)$$

where  $(Ownership)_{it}$  variables measures the fraction of the equity of firm  $i$ , lying between 0 and 100, that is owned by different group of owners in period  $t$ . The  $X_{it}$  variables are firm-specific factors. This specification allows for a firm specific fixed effect  $\delta_i(\delta_{i1} + \delta_{i2})$ , time effects which are common to firms captured by year dummies ( $\theta_t$ ), and a random unobserved component  $\varepsilon_{it}$ . The main advantage of a fixed effect estimation model is that it would control for the selection biases (see Gupta (2004)). Percentage shareholding of different investors (Foreign, Institutional, Corporate and Director) are correlated, because, these shares, along with the shares of ‘other top 50 shareholders’ and ‘others not included above’ adds upto ‘100’ percent. In order to avoid the problem of multi- collinearity, we use only four main shareholders, i.e. foreign, institutional, corporate, and director. We also use 1-digit and 2-digit level industry dummies, based on industrial classification of Annual Survey of Industries: National Industrial Classification (NIC:1998) by NSSO (National Sample Survey Organization), which has similar classification as of Standard Industrial Classification (SIC).

## B. Descriptive Statistics

We present a detailed structure of our sample in Table 2, which clearly reflects the unbalanced nature of the panel. Table 2 also depicts that most of the firms included in our sample belongs to NIC 1, 2 or 3 according to 1-digit industrial classification. Summary statistics relating to the variables used in the analysis is given in Table 3. Inspection of Table 3 reveals that the mean (median) *director* ownership level for the whole sample is 17.29 (10.64) percent, which is much larger than ownership of Japanese board members (2.01 percent as reported in Chen et al. (2003)) US board members (10.6 (3.4) percent as reported in Moreck et al. (1988)) and of the UK (13.34 (5.26) percent as reported in Short and Keasey (1999)). With Indian

sample for 1995-96 Sarkar and Sarkar (2000) reports mean ownership level of director as 15.4 percent. The mean percentage shareholding of *corporate*, in the whole sample is 26.12 percent. *Institutional* ownership has an average value of 1.7 percent with a very high standard deviation of 5.19 percent, this mean level of holding is much lower than those of in Japanese firms (43.3 percent with a very small standard deviation of 1.42 percent as reported in Chen et al. (2003)). Foreign ownership average is 10.84(3.51) percent with a standard deviation of 16.64 percent. Furthermore, differences in the ownership of director between Japan, US and the UK sample and the present Indian sample are apparent.

Our sample includes large as well as small firms with respect to sales and assets. Sales (mean Rs. 179.66 crore) vary between Rs. 40.91 to Rs. 20,301.39 crore, with the median level at Rs. 4,075 Crore. The mean ROA is 10.57(11.10) percent with a maximum of 38.36 percent and a minimum of 25.19 percent, which is higher than of the Thailand (7.18 percent as reported in Wiwattanakantang (2001)) and China (6.6 percent as reported in Qi et al. (2000)). This once again reinforces wide variation that exists within our sample and with other earlier studies examining the effect of ownership structure on firm value, using sample from US, UK and other emerging economies. Zhou (2001) has argued that fixed effect estimation should not be used in such analysis because of less variation in ownership structure. We provide results from the t-test for the change in ownership structure during the sample period for the common firms, providing evidence in favor of the hypothesis that change in ownership structure is significant.<sup>14</sup> Table 4 can be read as follows: let us take 1994 – 1995 as an example. The p-values for t-test for foreign is 0.011 implying that foreign ownership significantly changes between 1994 and 1995 for the common set of firms. Taking 1998 – 2000 as another example, we obtain that ownership of all categories change significantly for the common set of firms during this period. In sum, we find that ownership does change significantly over time if not between consecutive years, thus enabling us to use Fixed Effect Panel Data Models.<sup>15</sup> We

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<sup>14</sup>Common firms are those, which exists in both periods.

<sup>15</sup>Later, we also provide more support for using Fixed Effect Panel Data Models.

believe that this change could be more significant if we observe large time series or large number of cross-sections.

### **C. Regression Results**

In this paper, we use ‘ROA’ as the measure of firm performance in all regression analysis, if not otherwise stated. First we show the results from the regression of ROA on the governance and control variables on the year-by-year basis. For each year of the sample period, we regress ROA on governance and control variables using OLS. Table 5 reports the results from cross-sectional regressions with 1-digit industry dummy to mitigate the findings of previous studies in Indian context.<sup>16</sup> Each column in the table corresponds to each annual regression respectively. F-statistics for the industry dummies are highly significant for each year throughout the sample except for the year 1994 and 1999. We find that results vary across years in case of ownership variables. Foreign ownership has linear and positive impact on firm performance in 1994, 1997 and in 1998. The institutional investors’ share has negative effect in levels and positive effect in squares in 1994. This trend reverses in year 1996 and continues till 1998. We also find that industry dummies are significant at 1% level for all the years except for 1994 and 1999. In sum, our cross-sectional results indicate that none of the ownership variables effect is consistent over the years. This result may be explained with the help of unobserved firm heterogeneity.

Since year-by-year cross-sectional regressions do not use any time-series information, we use the pooled time-series cross-section regression to test the significance of each explanatory variable. We report results of pooled OLS without any firm, time dummy in Table 6 (column 1). In pooled regression without any time or industry dummy, we find that ‘foreign’ and ‘director’ have significant role to play in the firm’s performance and the impact is non-linear.<sup>17</sup>

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<sup>16</sup>We do not report coefficient estimates on Industry, Time and Firm dummies in order to save space. We however do provide the p-value for the F-statistics of their joint significance in all the Tables.

<sup>17</sup>The coefficients reported in the tables are multiplied by  $10^3$ , as most of the major variable’s coefficients are very less in value and non-zero values come after third digit in the decimals.

Column 2 of Table 6 reports the results with two-digit industry dummy (NIC-2) and time dummies. The results in terms of foreign ownership are same as in Column 1, but the coefficient of the square of directors' ownership becomes insignificant. We also document the evidence that industry and time dummies are significant.<sup>18</sup>

The mixed results of the OLS regression suggests to proceed with firm-fixed effect model (results reported in column 3 of Table 6). As the unobserved firm characteristics could be correlated with the ownership structure, which in turn could produce spurious regression results. We also present the results whether the fixed effect is at all required in such cases or not. To do this, we include fixed effect control for the ownership variable and for the other firm specific control variables, separately. We test their effect separately and jointly as well.<sup>19</sup> We document that controlling for unobserved firm heterogeneity (the firm fixed effect) is important (the firm fixed effect is significant) in all cases in terms of both: ownership as well as control variables, along with time effect.<sup>20</sup> Column 3 of Table 6 documents that both the institutional investors' and directors' holding have significant impact on firm performance even after controlling for unobserved firm heterogeneity. The impact is also non-linear in nature (the square of director (*director*<sup>2</sup>) and that of institutional investors (*institutional*<sup>2</sup>) is significant). The estimated threshold point occurs at around 15% for the institutional investors while for directors' it occurs at 24%.<sup>21</sup> This implies that ROA declines as institutional's (director's) share increases by 1% starting from 0 to 15% (24%) and then increases.<sup>22</sup> Our result is in sharp contrast with previous studies using Indian data: we do not obtain any significant relationship

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<sup>18</sup>Results from the F-Test at the end of the Table 6 indicates this.

<sup>19</sup>We define fixed effect control as mean value of the variable at the firm level for full sample. For example: if firm A has observations for 4 years and the mean value of 'foreign' of 4 years is 10%, then we use 10% as the fixed effect control for 'foreign'.

<sup>20</sup>We have provided four different tests in this regard. The term Control Group Effect gives the p-value from an F-Test whether the fixed-effect is required to control for unobserved firm heterogeneity for control variables like (age, size etc.). Ownership Group Effect gives the p-value from an F-Test whether the fixed-effect is required to control for unobserved firm heterogeneity in case of ownership, where as, Total Group Effect for both control as well as ownership variables. The term Joint Effect denotes the case with both: firm-specific fixed effects and time-effects.

<sup>21</sup>The same threshold in case of directors' holding is also obtained by Sarkar and Sarkar (2000).

<sup>22</sup>The result reported in terms of institutional ownership remain unaltered if we use DFFITS statistics to identify and remove the influential observations from our sample. The detailed results are available on request.

between foreign (corporate) ownership and firm performance. The results show that some of the control variables, like age, size of the firm, import and debt intensity are also significant. Among the observable firm-specific variables, the negative coefficient of the Age reflects that the firms in India are prone to inertia. The coefficients of  $\ln Sale$  and  $\ln Sale^2$  are significantly positive at conventional level (1 percent), this indicates that, ceteris paribus, larger firms perform better than smaller firms. Short and Keasey (1999) and Qi et al. (2000) also find similar results, but Chen et al. (2003) finds a negative relation. Negative and significant coefficient of Advertising Intensity can be explained with the help of expropriation hypothesis, which states that the managers (directors) may use these expenses for extraction purposes rather than the investment in the intangible assets. The significant negative coefficient of debt intensity is consistent with the argument that the financial risk reduces firm value. Chen et al. (2003) for Japanese firms and Qi et al. (2000) for Chinese firms, also find similar results. The negative coefficients may also reflect the fact that the firms with higher debt intensity had heavier interest burdens and their profitability were eroded by the higher interest payments. Alternatively it can be interpreted as being consistent with the pecking order effect. The coefficients of import intensity and tax intensity are significantly negative, indicating that ROA is lower for firms with greater tax provisions or import levels. Negative impact of import on the performance may reflect the fact that most of the Indian imports are in the form of the raw material or the machineries but very less technological imports. These imports may also be used for the luxury purposes rather than for the investment to increase the performance. This significant impact of ownership structure on performance (ROA) in a firm fixed-effects model is different from Himmelberg et al. (1999) using US data, though it is not consistent with the argument made by Zhou (2001).

To examine the relation between ownership structure and firm performance for the firms operating in industries, which are restricted from full access to foreign investors. We restrict our sample for the firms with foreign ownership less than 50 percent. Regression results are

reported in the column 4 of Table 6.<sup>23</sup> The reported results qualitatively remain the same as in case of Column 3 of Table 6.

To provide additional evidence of the relationship between group affiliation and firm performance, we have created a dummy variable taking the value of one if the firm belongs to a business group.<sup>24</sup> We have interacted this variable with the shareholding data of different ownership variable, namely, foreign, institutional, corporate and director. The results are presented in the last column of Table 6. The variable (Director\*Group) is positive although not significant and in sharp contrast to the strong negative impact of director. This implies that the owner managers in case of group firms influences firm performance positively although not significantly. This is in sharp contrast to the findings of Douma et al. (2003) and Khanna and Palepu (2000).

To check whether ownership's collinearity has anything to do with the obtained results, we use each ownership group separately (same as Patibandla (2002)). We report these results in Table 7. The results remain unchanged in terms of institutional and director as reported in Table 6. We also restrict our sample to one industry (1-digit NIC Classification is 2) as our sample indicates that most of the observations belong to this industry. The result is given in the last column of Table 7. We, however, include the entire ownership category in this case. In this case, although, 'institutional' still continues to be significant, 'director' loses its significance.

To focus more on the obtained results, we also use two different specifications of ownership variables for estimating the spline specification in the regression. The first one includes two piece-wise linear terms in ownership variables *foreign1*, *foreign2*, *director1*, *director2*, *institutional1*, *institutional2*, and *corporate1*, *corporate2*. Specifically,

$$Foreign1 = \begin{cases} \text{foreign ownership level} & \text{if foreign ownership level} < 25, \\ 25 & \text{everywhere else;} \end{cases}$$

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<sup>23</sup>Douma et al. (2003) have also used this restriction to account for the restriction on the foreign shareholding in some industries.

<sup>24</sup>We use CMIE's classification of group firms. This classification is also used by Khanna and Palepu (2000).

$$Foreign2 = \begin{cases} 0 & \text{if foreign ownership level} < 25, \\ \text{foreign ownership level minus 25} & \text{if foreign ownership level} \geq 25. \end{cases}$$

Similarly we specify piece-wise linear terms for ‘director’ and ‘corporate’, but in case of ‘institutional’ we use 15%.<sup>25</sup> In second specification we include again two piece-wise linear terms in ownership variables (*Foreign1*, *Foreign2*, *Director1*, *Director2*, *Institutional1*, *Institutional2*, and *Corporate1*, *Corporate2*) However, here we use 25% of all four categories. This approach has been used, among others by Sarkar and Sarkar (2000) and Morck et al. (1988).

The result with the spline specification is reported in Table 8. Column 1 of Table 8 reports the case with first spline construction, where as in column 3, we report the case with the second one. In column 2 of Table 8, the result with the first spline specification is reported for those firms where the foreign ownership is less than 50% and in column 4 for the second one. The estimates from column 1 show that ROA significantly increases by 0.7% for every 1% increase in directors’ holdings after 25% and significantly decreases by 0.2% for every 1% increase in institutional investors’ holdings below 15%. Use of threshold points at 25% for the spline does not alter the results, except that institutional and its square is marginally insignificant (Column 4 of Table 8). These results, therefore, suggest that the relationship between institutional and directors ownership and firm value is non-linear, consistent with the findings of Morck et al. (1988) and McConnell and Servaes (1990) with US data and Sarkar and Sarkar (2000) using Indian data for 1995-96. The one difference between our result and that of Sarkar and Sarkar (2000) is with respect to the effect of the institutional investors holding below 25 percent. While they find firm value to decrease uniformly below 25 percent of holding, we find the value to decline only between 0 and 15 percent.

We do some more robustness test with restriction on the sample properties in terms of year and report the result in Table 9. In column 1, we report the results for the first three

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<sup>25</sup>Recall that from our regression results of column 2 (Table 6), we obtain 15% as the threshold point in case of ‘Institutional’.

years of observations (1994-1996), where as in column 2, we do the same for the last three years (1998-2000). Column 3 and 4 report the results for the first four and the last four years respectively. The coefficients associated with institutional and its square is not significant in the first three years while it becomes significant for the last three. The result remains the same if we include the year 1997 in our observations. The coefficient of 'institutional' in level is negative and nearly significant. However, for the last four years, our conclusion remains the same as in the case of the whole sample. The coefficient associated with directors' holdings loses its significance if we break the sample.

Our results in terms of the role played by the institutional investors as a group is not consistent with Khanna and Palepu (2000).<sup>26</sup> In order to understand this, we further decompose financial institutions in three parts: governments share (Govt.), government sponsored banks, insurance companies and mutual funds (Fin.Inst.) and development financial institutions (Dev.Fin.Inst.). The results are presented in column 1 of Table 10. The firms' performance as measured by ROA decreases as Dev.Fin.Inst.'s share increases from 0 to 15% and then increases. It suggests that the 'Dev.Fin.Inst.' monitors the firm once they have at least 15% stakes in it. This is consistent with Sarkar and Sarkar (2000). However, our results are definitely an improvement in the preciseness of the non-linearity. We find that the institutional investors have positive impact on the firm performance, when their stake is higher than the 15% (whereas Sarkar and Sarkar (2000) finds it at 25%). One possible explanation for the difference could be given with the help of the performance measurement. As they use MBVR as a performance measure, the difference can also be explained with the unobserved firm heterogeneity. Development financial institutions have both debt and equity holding while the others just have equity holdings. Our results almost remain the same if we restrict our analysis to the set of firms where the foreign ownership is less than 50%. Here the ownership by government sponsored banks, insurance companies and mutual funds (Fin.Inst.) becomes also significant in influencing firm performance if their ownership crosses 19%.

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<sup>26</sup>This may be because of not controlling for unobserved firm heterogeneity, which exists in case of Indian corporate firms.

## D. Robustness of the Results

There are at least three issues to consider when evaluating effect of ownership on firm performance. First whether the results are robust to the performance measurements. Second is the issue of time dependence of the results and thirdly the sample selection bias. For example: the relationship may differ if we have firms only with higher value or only with lower values. To check the robustness of our results, we do some restricted sample analysis, findings are reported in Table 11. In column 1, firms with positive ROA are considered for the regression analysis. The results indicate that except institutional, none of the other ownership variables are significant. Performance of firms with positive net worth does not share significant relationship with ownership (column 2). The same feature holds true for firms with firms having a manufacturing intensity higher than 50%, although the square of the directors' shareholding significantly increases performance of the firms (column 3). In column 4, we report the case for top 25% firms according to gross sales and bottom 25% in column 5. We find that performance of firms in top 25% class or in bottom 25% class does not change with change in ownership structure, but their performance does change for top 25% and bottom 25% of the firms classified by age variable with the ownership of institutional investors (column 6 & 7 respectively).

We have stated earlier that to mitigate the problem of outliers, we restrict the dependent variable (ROA) to lie between 1% and 99%. We test the sensitivity of this by restricting ROA to lie between 10% and 90% and report the results in column 1 of Table 12. We still find the institutional is significant in level and also in its square, however, the variable director loses its significance. The threshold point for institutional is found to be at 18%. It implies that ROA decreases when institutional increases upto 18% and then starts increasing. Omitting firms where foreign ownership is more than 50% does not alter our results (column 2 of Table 12). We also perform our analysis in terms of other performance variable: Return on Equity (ROE), Market to Book value ratio (MBVR) and PQ ratio (PQ\_A). In all these cases, we restrict the dependent variable to lie between 10% and 90% and we impose the additional restriction that

foreign ownership (Foreign) to be less than 50%. When we use ROE as dependent variable, ‘institutional’ still has negative effect on firm performance in level and positive effect with its squares, which is similar with ROA as performance measure. The threshold point turns out to be at 19% in case of ROE.<sup>27</sup> Use of market based measure such as MBVR does not change the results in terms of institutional ownership, however, here the holding by corporates’ increases firm value in level.<sup>28</sup> The last column of Table 12 reports the result where we PQ\_A as our performance. In this case, we find that only the director’s holding increases the value of the firm if their holding crosses 18%.

## **E. Is Ownership Endogenous?**

There has been increasing concern about the endogeneity issue of ownership variables in literature (Himmelberg et al. (1999)). We try to mitigate this problem in this part of our paper. The results of the regression with instrumental variables are given in Table 13. Column 1 of Table 13 reports the results where we use 2<sup>nd</sup> lag and the difference between 1<sup>st</sup> and 2<sup>nd</sup> lag of the ownership variable as instruments. Results from the endogeneity and over-identification test are also reported in Table 13 (Column 1). We find that ownership variables are not endogenous. We also document that use of instruments satisfies the over-identification test. In column 2 of Table 13, we also report the results from the first-differenced model.<sup>29</sup> Our results document that changes in institutional investors influences the changes in firm performance significantly and the effect is non-linear. Here the directors’ shareholding is no longer significant. We also show that if the foreign ownership increases over 13%, then the changes in foreign ownership exerts a negative influence on firm performance. Results of the regression after controlling for outliers by methods of R-Student and DFFITS are also reported in the

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<sup>27</sup>Restricting ROE to lie between 1% and 99% does not alter our results. The results are not presented although available on request.

<sup>28</sup>Without restriction on foreign ownership gives the same qualitative result in case of MBVR as reported in Table 12. However, if we restrict MBVR to lie between 1% and 99%, ownership variable is not significant in influencing MBVR.

<sup>29</sup>First-differencing is another approach to remove the firm fixed effects.

Table 13. Column 3 reports the results when we control for outliers by R-Student method and column 4 reports the results of the regression analysis by removing outliers from the sample using DFFITS statistics.

## **F. Does the Dominant Owner Influences Performance?**

In order to examine whether the dominant owner influences firm performance, we construct a variable that acts as a proxy for the dominant group's equity holding. For each observation, we use the maximum of the shareholding of the four owners as the dominant ones. We use that shareholding representing the stake of the dominant group and use zeros for the others.<sup>30</sup> To be consistent with our previous specification, we also include the square of the shareholding by the dominant owner. The results are reported in Table 14. We obtain that if the directors' act as a dominant group, it influences firm performance even after controlling for unobserved firm heterogeneity. The impact is non-linear in nature (although the level is not significant, the square term is significant). The estimated threshold point occurs at around 21%.

## **IV. Conclusion**

This study has examined empirically the relationship between the ownership structure and firm performance using a panel of Indian corporate firms over 1994-2000, from an agency perspective. We document that unobserved firm heterogeneity explains a large fraction of cross-sectional variation in firm performance that exists among Indian corporate firms. Firm performance show substantial cross-sectional and inter-temporal variation.

We conclude that the foreign shareholding pattern does not influence the firm performance significantly. This result is in sharp contrast with other existing studies with respect to India

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<sup>30</sup>For example, for firm  $i$  in year  $t$ , suppose that the holdings by the foreign, institutional, corporates' and directors' stand at 16%, 4%, 12% and 27% respectively. In our construction, we would classify the directors' as the dominant group with a shareholding of 27% and the rest as zero.

and other developing countries, which find that foreign ownership lead to higher performance. We document that institutional investors especially the development financial institutions affect firm performance positively once their ownership crosses a threshold level. Institutional investors monitor the firm once they have at least 15% equity stakes in it. The shareholding by the directors' also influences the performance of the firm beyond a certain threshold. This is consistent with the fact that many Indian corporates' are family dominated enterprises. Our analysis also document that the effect of managerial shareholding and firm performance does not differ significantly across group and stand-alone firms. Our results also document that ownership variable is not endogenous. Our results are robust to the time. Sensitivity analysis indicates that the results are robust under several different alternative specifications and sub samples.

Given the contradictory results produced by the current study and the prior studies using Indian data, it is clear that there are many questions relating to the relationship between share holding pattern and performance of the firm, which remain unsolved. Before drawing implications for the modeling and practice of corporate governance in India, however a number caveats must be noted. Perhaps the most important one has to do with the measurement of ownership variables. The measure we use does not distinguish among different type of shareholders. For example, 'Foreign' includes foreign institutional investors and foreign corporate investors. A finer classification scheme might reveal a more important role of ownership categories. A second caveat has to do with the sample characteristics (smaller time-series). A more broad coverage in the sample in terms of cross-section and time-series might answer the question of significant change in ownership. There remains the task of finding out the mechanisms for the determination of shareholding pattern and corporate governance practices. One other useful extension of this analysis would be to include additional policy variables measuring changes in the market conditions such as trade or tax policy changes, to see whether ownership structure changes dramatically or not, if so to what extent and why? Do firms in India actually raise substantial equity finance from its investors? Who are the investors? If they are dispersed minority shareholder, why are they buying equity despite the apparent absence

of minority protections in India? Analyzing the behavior of ownership variables with other governance mechanisms, such as: board structure, CEO remuneration, capital structure, etc. can shed more light on the interaction of the different components of the corporate governance and firm performance. However, these are left for future research.

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Table 1: List of Variables

Abbreviation	Description
Performance Measures: ROA, ROE, MBVR, PQ_A	
ROA	<p>We measure Return on Assets as the ratio of return to total assets, where return is defined as the difference between operating revenues and expenditure before tax and interest payments (i.e. pbdit) and total asset of firm includes fixed assets, investments and current assets. R&amp;D expenditures are included in operating expenditure in the year incurred, even though the R&amp;D results may produce technical breakthroughs that will benefit the firm for years to come. We treat, therefore, R&amp;D as investment rather than as current expenditure. Total assets include value of fixed assets, investments and current assets.</p> <p>ROA = Profit Before Depreciation, Interest and Tax (PBDIT) / Total Assets</p>
ROE	<p>We measure Return on Equity Capital as the ratio of return to equity capital. Equity Capital is the total outstanding paid up equity capital of the firm as at the end of the accounting period. Shares issued but not paid-up or pending allotments do not form part of equity capital. This includes bonus equity shares issued, if any, by the firm in the past.</p> <p>ROE = PBDIT/ Equity Capital</p>
PQ_A	<p>Proxy for Tobin's Average Q is defined as the ratio of the value of the firm divided by the replacement value of firm. For firm value, we use the market value of common equity plus total borrowings (includes all form of debt, interest bearing or other wise), and for the replacement value, we use total assets. We use last trading day's closing price for calculating market value of the firm.</p> <p>PQ_A = (Total Borrowings + Market Value (Equity) )/ Total Assets</p>
MBVR	<p>Market to Book Value Ratio is defined as the ratio of the market value of the firm divided by the book value of firm. For market value of firm, we use the market value of common equity plus total borrowings (includes all form of debt, interest bearing or other wise). We use last trading day's closing price for calculating market value of the firm.</p> <p>MBVR = (Total Borrowings + Market Value (Equity) )/ Book Value (Equity)</p>
Ownership Variables	
Foreign	<p>Foreigners' Share Holding is equity shares held by foreigners as percentage of total equity shares. These include foreign collaborators, foreign financial institutions, foreign nationals and non-resident Indians.</p>
Institutional	<p>Governments' and Financial Institutions' Share Holding is equity shares held by government companies as percentage of total equity shares. These includes insurance companies, mutual funds, financial institutions, banks, central and state government firms, state financial Corporations and other government bodies.</p>
Corporate	<p>Corporates' Share Holding is equity shares held by Corporate bodies as a percentage of total equity shares. These include corporate bodies excluding those already covered.</p>

Director	Directors' Share Holding is equity shares held by Directors of the firm as defined in section 6 of the Companies Act, 1956. Which includes the share held by the family members of the director.
Control Variables	
Age	Age is defined as the number of years since its inception. Where incorporation year pertains to the most recent incarnation year of the firm. In the case of firms that were reorganized, the year of incorporation may not reflect the true age of a firm (age calculated as above may give negative ages also). Therefore, we restrict our analysis to those firm-years whose age is non-negative, as calculated.
lnSale	Defined as natural logarithm of Gross Sales. Gross Sales denotes the revenue generated by an enterprise during a given accounting period. It excludes other income and income from non-recurring transactions, income of extra-ordinary nature and prior period income. Sales are always taken gross of indirect taxes such as excise duties.
Manufacturing Intensity	Measured as the ratio of manufacturing sales over gross sales. Sales of Manufacturing Goods is the sales generated through sale of its ownership manufactured goods.
Export Intensity	Export Intensity is the total revenue earned from exports of goods and services, income earned in foreign currency by ways of interest, dividend, royalties, and consultancy fees divided by gross sales.
Import Intensity	Import Intensity is defined as the ratio of total imports to gross sales. Total imports include not only import of raw materials etc, but also import of capital good.
R&D Intensity	R&D Intensity is the ratio of total expenditure (capital and current account) incurred by the firm in research and development to gross sales.
Debt Intensity	Debt Intensity is the ratio of long term borrowings (total borrowings + short term bank borrowings - commercial paper) to total assets.
Capital Intensity	Capital Intensity is the ratio of total assets to gross sales.
Advertising Intensity	Advertising Intensity is defined as the ratio of advertising expenditure of the firm to the sales.
Marketing Intensity	Marketing Intensity is the ratio of marketing expenses of the firm to its gross sales.
Distribution Intensity	Distribution Intensity is the ratio of distribution expenditure to gross sales.
Tax Intensity	Tax Intensity is defined as the ratio of provisions for indirect taxes to gross sales.

**Table 2**

**Data structure for 1 digit National Industry Classification Code (NIC)**

NIC-1 Digit	1994	1995	1996	1997	1998	1999	2000	Total
1-Mining and Quarrying	42	107	202	194	290	143	297	1275
2-Automobile	114	203	407	458	635	336	607	2760
3-Machinery	29	49	111	130	179	90	177	765
4-Electricity, Gas and Construction	4	4	4	4	11	2	6	35
5-Wholesale and Retail Trade	0	0	1	1	0	0	1	3
6-Transport, Storage and Communications	0	0	2	0	0	0	0	2
7-Computer and Related Activities	0	9	18	15	31	29	51	153
9-Diversified	7	10	19	23	33	12	21	125
Total	196	382	764	825	1179	612	1160	5118

**Table 3**  
**Descriptive Statistics**

	Obs.	Mean	Std. Dev.	Min.	Median	Max.
ROA	5118	0.105	0.097	-.258	0.111	0.387
ROE	5115	1.552	3.307	-6.142	0.851	128
MBVR	4458	1.052	63.651	-2104.295	1.0118	1907.586
PQ_A	5031	1.764	23.848	0.000	0.652	1343.351
Foreign	5118	10.839	16.636	0.000	3.51	100
Corporate	5118	26.123	20.889	0.000	22.395	100
Director	5118	17.291	19.189	0.000	10.64	97.489
Institutional	5118	1.701	5.193	0.000	0.000	60.061
Age	5118	22.373	20.696	0.000	15	175
Sales	5118	180.322	617.755	0.000	40.91	20301.391
Indirect Taxes	5118	21.516	130.081	0.000	1.63	4121.04
Advertising	5118	1.956	16.793	0.000	0.01	737.88
Marketing	5118	3.051	10.009	0.000	0.271	152.09
Distribution	5118	4.668	23.457	0.000	.245	555.359
Total Exports	5118	18.583	67.118	0.000	0.000	1948
Total Imports	5118	25.612	135.434	0.000	2.245	5176.689
R&D	5017	0.007	0.449	0.000	0.000	31.837
PBDIT	5118	28.996	124.368	-96.709	4.775	4788.439
Equity Capital	5118	16.758	48.404	0.000	6.135	1054.75
Total Assets	5118	240.767	948.373	0.22	45.77	29368.82
Net Worth	5118	85.031	376.086	-1626.39	14.2	11211.69
Total Borrowing	5118	96.587	397.838	0.000	15.455	11520.24
Long term Borrowing	5118	75.048	358.043	0.000	8.805	10871.43
Book Value	4912	131.483	983.821	-2580.659	11.42	27639.061

**Table 4****Results of T-test (p-value) for changes in ownership variables over time**

Years	Variables			
	Foreign	Institutional	Director	Corporate
1994 – 1995	0.010*	0.014*	0.430	0.364
1995 – 1996	0.555	0.680	0.087+	0.163
1996 – 1997	0.004**	0.756	0.200	0.066+
1997 – 1998	0.907	0.401	0.173	0.398
1998 – 1999	0.134	0.103	0.482	0.629
1999 – 2000	0.205	0.069+	0.990	0.434
1994 – 1996	0.062+	0.135	0.730	0.177
1995 – 1997	0.0304*	0.8973	0.2234	0.0347*
1996 – 1998	0.060+	0.581	0.068+	0.349
1997 – 1999	0.6372	0.1422	0.2430	0.6089
1998 – 2000	0.008**	0.068+	0.002**	0.007**
1994 – 1997	0.003**	0.142	0.969	0.034*
1995 – 1998	0.1917	0.6228	0.0463*	0.0431*
1996 – 1999	0.2095	0.0187*	0.4404	0.9913
1997 – 2000	0.010*	0.538	0.000**	0.004**
1994 – 2000	0.339	0.512	0.873	0.001**

+ significant at 10%; \* significant at 5%; \*\* significant at 1%.

Table 5

## Cross-Sectional Regression results with 1-Digit Industry Dummy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age	0.002 (0.994)	0.145 (0.478)	-0.263 (0.108)	-0.287 (0.065)+	-0.428 (0.000)**	-0.454 (0.016)*	-0.303 (0.044)*
lnSale	32.873 (0.000)**	28.916 (0.000)**	40.233 (0.000)**	44.034 (0.000)**	42.028 (0.000)**	20.387 (0.001)**	21.765 (0.000)**
<i>lnSale</i> <sup>2</sup>	-3.175 (0.001)**	-2.639 (0.001)**	-2.862 (0.000)**	-2.982 (0.000)**	-2.361 (0.000)**	0.304 (0.703)	-0.334 (0.373)
Marketing Intensity	-355.753 (0.146)	-207.680 (0.164)	-24.032 (0.783)	-104.092 (0.549)	33.021 (0.643)	-77.050 (0.525)	-68.434 (0.386)
Advertising Intensity	-546.723 (0.150)	-151.822 (0.593)	-14.808 (0.863)	211.655 (0.253)	284.597 (0.013)*	427.816 (0.007)**	-17.691 (0.910)
R&D Intensity	-132.335 (0.933)	2,460.823 (0.226)	-626.893 (0.615)	10.305 (0.975)	-73.199 (0.022)*	5.715 (0.000)**	57.622 (0.899)
Distribution Intensity	93.991 (0.644)	54.567 (0.396)	167.918 (0.036)*	15.746 (0.777)	-121.562 (0.127)	-55.992 (0.529)	-266.697 (0.012)*
Export Intensity	0.298 (0.993)	5.779 (0.714)	-9.816 (0.440)	-23.202 (0.099)+	8.121 (0.398)	57.100 (0.001)**	30.302 (0.015)*
Import Intensity	-27.887 (0.067)+	0.384 (0.731)	0.226 (0.843)	-9.516 (0.330)	-7.066 (0.041)*	-34.886 (0.109)	1.089 (0.700)
Tax Intensity	79.036 (0.265)	46.739 (0.388)	15.589 (0.681)	2.953 (0.943)	7.374 (0.563)	76.782 (0.193)	-2.736 (0.269)
Debt Intensity	-112.487 (0.001)**	-17.495 (0.647)	-87.059 (0.000)**	-97.741 (0.000)**	-114.217 (0.000)**	-128.208 (0.000)**	-90.223 (0.000)**
Capital Intensity	-0.219 (0.750)	0.135 (0.701)	0.159 (0.001)**	0.494 (0.000)**	0.315 (0.000)**	-0.136 (0.625)	-0.007 (0.920)
Foreign	2.719 (0.017)*	0.138 (0.846)	0.755 (0.186)	1.352 (0.015)*	1.241 (0.002)**	0.791 (0.275)	0.436 (0.296)
<i>Foreign</i> <sup>2</sup>	-0.019 (0.372)	0.008 (0.566)	0.009 (0.438)	-0.010 (0.283)	-0.014 (0.035)*	-0.007 (0.588)	-0.004 (0.498)
Institutional	-4.274 (0.099)+	-0.918 (0.652)	1.713 (0.096)+	1.365 (0.159)	0.072 (0.954)	-1.449 (0.218)	-1.950 (0.080)+
<i>Institutional</i> <sup>2</sup>	0.236 (0.012)*	0.068 (0.342)	-0.042 (0.074)+	-0.041 (0.044)*	-0.011 (0.817)	0.007 (0.776)	0.031 (0.320)
Director	1.374 (0.161)	0.770 (0.181)	0.663 (0.148)	0.235 (0.565)	1.101 (0.004)**	1.272 (0.021)*	0.314 (0.428)
<i>Director</i> <sup>2</sup>	-0.006 (0.669)	-0.009 (0.334)	-0.009 (0.214)	0.001 (0.802)	-0.010 (0.085)+	-0.012 (0.102)	0.002 (0.704)
Corporate	1.543 (0.206)	-0.090 (0.894)	-0.015 (0.974)	0.377 (0.430)	0.390 (0.306)	-0.423 (0.451)	0.529 (0.165)
<i>Corporate</i> <sup>2</sup>	-0.007 (0.723)	0.003 (0.734)	0.006 (0.351)	-0.006 (0.371)	-0.003 (0.596)	0.011 (0.097)+	-0.005 (0.237)
Observations	187	365	734	806	1163	600	1155
Adjusted <i>R</i> <sup>2</sup>	0.2700	0.1784	0.3165	0.2998	0.3169	0.2628	0.2521
Industry Effect	0.817	0.001**	0.000**	0.042*	0.019*	0.907	0.000**

Numbers in parentheses are p-values of t-statistics. Standard errors are robust to heteroscedasticity.

Intercept term is used in the regression but not reported here. + significant at 10%; \* significant at 5%; \*\* significant at 1%.

Dependent variable is restricted to lie between 1% 99%. Coefficients reported are: Actual Coefficient\*1000.

p-values of F-test for joint significance are reported after Adjusted *R*<sup>2</sup>.

**Table 6**

**Pooled Regression Results with Time, 2-Digit Industry and Firm Dummy**

	(1)	(2)	(3)	(4)	(5)
Age	-0.323 (0.000)**	-0.287 (0.000)**	-15.616 (0.000)**	-15.519 (0.000)**	-15.594 (0.000)**
lnSale	29.775 (0.000)**	30.792 (0.000)**	18.798 (0.002)**	18.917 (0.003)**	18.930 (0.002)**
<i>lnSale</i> <sup>2</sup>	-1.322 (0.000)**	-1.325 (0.000)**	6.571 (0.000)**	6.433 (0.000)**	6.582 (0.000)**
Marketing Intensity	-77.761 (0.064)+	-93.500 (0.039)*	-89.668 (0.484)	-84.728 (0.510)	-96.201 (0.455)
Advertising Intensity	54.049 (0.323)	44.693 (0.436)	-260.418 (0.004)**	-229.861 (0.016)*	-260.167 (0.004)**
R&D Intensity	6.443 (0.000)**	4.625 (0.000)**	13.749 (0.691)	173.745 (0.473)	16.987 (0.628)
Distribution Intensity	-72.254 (0.020)*	-69.536 (0.036)*	-19.430 (0.844)	-38.156 (0.703)	-21.787 (0.826)
Export Intensity	10.955 (0.033)*	11.063 (0.040)*	23.395 (0.166)	25.062 (0.156)	22.257 (0.189)
Import Intensity	0.077 (0.841)	0.263 (0.367)	-1.548 (0.000)**	-1.514 (0.001)**	-1.550 (0.000)**
Tax Intensity	-0.427 (0.841)	-1.025 (0.691)	-8.529 (0.000)**	-8.271 (0.000)**	-8.245 (0.000)**
Debt Intensity	-104.749 (0.000)**	-97.790 (0.000)**	-110.686 (0.000)**	-108.677 (0.000)**	-111.765 (0.000)**
Capital Intensity	0.111 (0.002)**	0.121 (0.001)**	0.198 (0.152)	0.192 (0.167)	0.199 (0.149)
Foreign	1.100 (0.000)**	0.984 (0.000)**	0.091 (0.869)	-0.039 (0.960)	0.497 (0.444)
<i>Foreign</i> <sup>2</sup>	-0.010 (0.004)**	-0.009 (0.008)**	-0.009 (0.354)	0.000 (0.995)	-0.012 (0.219)
Institutional	0.072 (0.892)	0.083 (0.872)	-2.660 (0.069)+	-2.718 (0.082)+	-2.476 (0.120)
<i>Institutional</i> <sup>2</sup>	-0.014 (0.441)	-0.014 (0.413)	0.088 (0.082)+	0.089 (0.096)+	0.086 (0.090)+
Director	0.704 (0.000)**	0.684 (0.000)**	-0.894 (0.093)+	-0.890 (0.103)	-1.106 (0.038)*
<i>Director</i> <sup>2</sup>	-0.005 (0.073)+	-0.004 (0.128)	0.019 (0.023)*	0.019 (0.025)*	0.019 (0.025)*
Corporate	0.214 (0.249)	0.158 (0.396)	0.051 (0.918)	0.085 (0.873)	0.137 (0.792)
<i>Corporate</i> <sup>2</sup>	0.000 (0.885)	0.001 (0.819)	-0.003 (0.688)	-0.003 (0.671)	-0.003 (0.670)
Foreign*Group					-0.497 (0.378)
Institutional*Group					-0.126 (0.903)
Corporate*Group					-0.094 (0.825)
Director*Group					0.649 (0.219)
Observations	5017	5017	5017	4684	5017
Adjusted <i>R</i> <sup>2</sup>	0.2635	0.2934	0.7074	0.6969	0.7076
Time Effect	0.000**	0.000**	0.027*	0.013*	0.029*
Industry Effect		0.000**			
Control Group Effect			0.000**	0.000**	0.000**
Ownership Group Effect			0.002**	0.004**	0.003**
Total Group Effect			0.000**	0.000**	0.000**
Joint Effect			0.000**	0.000**	0.000**

Numbers in parentheses are p-values of t-statistics. Standard errors are robust to heteroscedasticity. Intercept term is used in the regression but not reported here. + significant at 10%; \* significant at 5%; \*\* significant at 1%. Dependent variable is restricted to lie between 1% 99%. Coefficients reported are: Actual Coefficient\*1000. p-values of F-test for joint significance are reported after Adjusted *R*<sup>2</sup>.

Table 7

## One Ownership Variable at a Time with Firm Dummy

	(1)	(2)	(3)	(4)	(5)
Age	-15.872 (0.000)**	-15.702 (0.000)**	-15.808 (0.000)**	-16.055 (0.000)**	-16.911 (0.000)**
lnSale	18.888 (0.002)**	19.059 (0.002)**	19.352 (0.002)**	19.227 (0.002)**	14.365 (0.071)+
<i>lnSale</i> <sup>2</sup>	6.562 (0.000)**	6.479 (0.000)**	6.450 (0.000)**	6.491 (0.000)**	8.079 (0.000)**
Marketing Intensity	-92.752 (0.479)	-96.841 (0.457)	-91.547 (0.483)	-90.723 (0.486)	40.205 (0.818)
Advertising Intensity	-254.718 (0.004)**	-250.160 (0.006)**	-246.710 (0.006)**	-248.787 (0.005)**	-559.428 (0.006)**
R&D Intensity	14.747 (0.667)	7.373 (0.826)	11.272 (0.742)	11.743 (0.731)	10.138 (0.737)
Distribution Intensity	-21.795 (0.824)	-24.334 (0.804)	-25.280 (0.796)	-27.433 (0.780)	-37.636 (0.848)
Export Intensity	22.094 (0.192)	22.737 (0.177)	21.642 (0.201)	21.537 (0.204)	31.462 (0.262)
Import Intensity	-1.511 (0.001)**	-1.517 (0.001)**	-1.517 (0.001)**	-1.518 (0.001)**	-1.725 (0.000)**
Tax Intensity	-9.026 (0.000)**	-9.100 (0.000)**	-9.097 (0.000)**	-8.454 (0.000)**	-10.940 (0.000)**
Debt Intensity	-108.254 (0.000)**	-107.546 (0.000)**	-106.298 (0.000)**	-107.264 (0.000)**	-142.214 (0.000)**
Capital Intensity	0.195 (0.153)	0.199 (0.151)	0.200 (0.145)	0.200 (0.147)	0.127 (0.321)
Foreign	0.011 (0.984)				1.000 (0.202)
<i>Foreign</i> <sup>2</sup>	-0.007 (0.481)				-0.022 (0.105)
Institutional		-2.483 (0.090)+			-3.267 (0.082)+
<i>Institutional</i> <sup>2</sup>		0.086 (0.095)+			0.110 (0.086)+
Corporate			-0.079 (0.872)		-0.111 (0.864)
<i>Corporate</i> <sup>2</sup>			-0.001 (0.906)		0.001 (0.912)
Director				-0.822 (0.126)	-0.554 (0.451)
<i>Director</i> <sup>2</sup>				0.019 (0.019)*	0.017 (0.150)
Observations	5017	5017	5017	5017	2706
Adjusted <i>R</i> <sup>2</sup>	0.7060	0.7063	0.7058	0.7068	0.7057
Control Group Effect	0.000**	0.000**	0.000**	0.000**	0.000**
Ownership Group Effect	0.079+	0.169	0.677	0.036*	0.092+
Total Group Effect	0.000**	0.000**	0.000**	0.000**	0.000**
Time Effect	0.023*	0.019*	0.014*	0.021*	0.027*
Joint Effect	0.000**	0.000**	0.000**	0.000**	0.000**

Numbers in parentheses are p-values of t-statistics. Standard errors are robust to heteroscedasticity.

Intercept term is used in the regression but not reported here. + significant at 10%; \* significant at 5%; \*\* significant at 1%.

Dependent variable is restricted to lie between 1% 99%. Coefficients reported are: Actual Coefficient\*1000.

p-values of F-test for joint significance are reported after Adjusted *R*<sup>2</sup>.

**Table 8**

**Regression Results with Spline Specification**

	(1)	(2)	(3)	(4)
Age	-15.700 (0.000)**	-15.573 (0.000)**	-15.704 (0.000)**	-15.580 (0.000)**
lnSale	18.781 (0.002)**	18.914 (0.003)**	18.855 (0.002)**	19.012 (0.002)**
<i>lnSale</i> <sup>2</sup>	6.583 (0.000)**	6.421 (0.000)**	6.583 (0.000)**	6.417 (0.000)**
Marketing Intensity	-85.833 (0.507)	-81.764 (0.527)	-85.138 (0.512)	-80.834 (0.535)
Advertising Intensity	-260.070 (0.004)**	-226.993 (0.017)*	-258.342 (0.004)**	-225.351 (0.017)*
R&D Intensity	10.465 (0.762)	176.396 (0.466)	10.383 (0.762)	171.952 (0.473)
Distribution Intensity	-20.846 (0.833)	-40.871 (0.683)	-21.207 (0.830)	-40.863 (0.682)
Export Intensity	23.426 (0.164)	25.169 (0.152)	23.753 (0.161)	25.512 (0.149)
Import Intensity	-1.548 (0.000)**	-1.514 (0.001)**	-1.538 (0.001)**	-1.502 (0.001)**
Tax Intensity	-8.766 (0.000)**	-8.719 (0.000)**	-8.729 (0.000)**	-8.641 (0.000)**
Debt Intensity	-109.909 (0.000)**	-108.211 (0.000)**	-110.948 (0.000)**	-109.324 (0.000)**
Capital Intensity	0.198 (0.151)	0.192 (0.165)	0.198 (0.150)	0.192 (0.164)
Foreign: (.,25)	-0.097 (0.824)	-0.199 (0.655)	-0.103 (0.812)	-0.207 (0.640)
Foreign: (25,.)	-0.662 (0.226)	0.507 (0.645)	-0.643 (0.237)	0.479 (0.662)
Institutional: (.,15)	-1.746 (0.096)+	-1.862 (0.097)+		
Institutional: (15,.)	2.084 (0.155)	2.182 (0.150)		
Director: (.,25)	-0.495 (0.246)	-0.494 (0.259)	-0.502 (0.240)	-0.501 (0.253)
Director: (25,.)	0.748 (0.078)+	0.745 (0.086)+	0.745 (0.079)+	0.745 (0.086)+
Corporate: (.,25)	-0.181 (0.648)	-0.211 (0.630)	-0.192 (0.629)	-0.207 (0.636)
Corporate: (25,.)	-0.131 (0.674)	-0.111 (0.736)	-0.123 (0.693)	-0.108 (0.742)
Institutional: (.,25)			-1.000 (0.126)	-1.057 (0.134)
Institutional: (25,.)			4.586 (0.109)	4.655 (0.116)
Observations	5017	4684	5017	4684
Adjusted R <sup>2</sup>	0.7071	0.6968	0.7071	0.6968
Time Effect	0.023*	0.012*	0.025*	0.013*

Numbers in parentheses are p-values of t-statistics. Standard errors are robust to heteroscedasticity. Intercept term is used in the regression but not reported here. + significant at 10%; \* significant at 5%; \*\* significant at 1%. Dependent variable is restricted to lie between 1% 99%. Coefficients reported are: Actual Coefficient\*1000. p-values of F-test for joint significance are reported after Adjusted R<sup>2</sup>.

**Table 9**

**Regression Results with Three Years of Common Observations**

	(1)	(2)	(3)	(4)
Age	-17.726 (0.001)**	-11.831 (0.015)*	-22.032 (0.000)**	-13.492 (0.000)**
lnSale	48.906 (0.021)*	42.087 (0.270)	52.913 (0.001)**	63.731 (0.013)*
<i>lnSale</i> <sup>2</sup>	2.445 (0.424)	4.092 (0.330)	5.243 (0.012)*	0.366 (0.907)
Marketing Intensity	-163.908 (0.693)	-103.615 (0.736)	-12.803 (0.965)	-286.593 (0.193)
Advertising Intensity	-588.154 (0.218)	-302.643 (0.615)	102.418 (0.756)	-247.075 (0.218)
R&D Intensity	-267.158 (0.828)	-633.387 (0.110)	9.862 (0.961)	-48.057 (0.302)
Distribution Intensity	-786.733 (0.129)	-43.584 (0.900)	-339.946 (0.276)	-3.291 (0.991)
Export Intensity	140.316 (0.109)	-14.002 (0.836)	76.568 (0.068)+	-37.644 (0.397)
Import Intensity	-2.478 (0.020)*	-73.384 (0.148)	-2.667 (0.094)+	-38.832 (0.141)
Tax Intensity	-118.083 (0.217)	-527.526 (0.024)*	-177.863 (0.080)+	-274.154 (0.172)
Debt Intensity	-169.621 (0.001)**	-190.945 (0.011)*	-136.132 (0.000)**	-149.282 (0.000)**
Capital Intensity	0.668 (0.265)	0.639 (0.072)+	0.919 (0.093)+	0.807 (0.017)*
Foreign	0.127 (0.918)	2.209 (0.374)	-0.712 (0.552)	1.500 (0.238)
<i>Foreign</i> <sup>2</sup>	0.019 (0.541)	-0.040 (0.356)	0.015 (0.485)	-0.031 (0.169)
Institutional	-2.542 (0.293)	-11.141 (0.075)+	-3.699 (0.124)	-7.473 (0.050)+
<i>Institutional</i> <sup>2</sup>	0.057 (0.455)	0.409 (0.043)*	0.096 (0.222)	0.309 (0.031)*
Director	-0.023 (0.988)	-1.288 (0.603)	0.855 (0.429)	-1.637 (0.185)
<i>Director</i> <sup>2</sup>	0.006 (0.820)	0.031 (0.415)	-0.009 (0.661)	0.023 (0.266)
Corporate	-0.425 (0.705)	-0.676 (0.738)	-0.154 (0.875)	-0.804 (0.443)
<i>Corporate</i> <sup>2</sup>	0.015 (0.368)	0.003 (0.898)	0.004 (0.807)	0.009 (0.542)
Observations	1282	2335	2100	3335
Adjusted <i>R</i> <sup>2</sup>	0.7591	0.7361	0.8381	0.7084
Control Group Effect	0.000**	0.000**	0.000**	0.000**
Ownership Group Effect	0.005**	0.123	0.021*	0.073+
Total Group Effect	0.000**	0.000**	0.000**	0.000**
Time Effect	0.819	0.860	0.853	0.059+
Joint Effect	0.000**	0.000**	0.000**	0.000**

Numbers in parentheses are p-values of t-statistics. Standard errors are robust to heteroscedasticity. Intercept term is used in the regression but not reported here. + significant at 10%; \* significant at 5%; \*\* significant at 1%. Dependent variable is restricted to lie between 1% 99%. Coefficients reported are: Actual Coefficient\*1000. p-values of F-test for joint significance are reported after Adjusted *R*<sup>2</sup>.

**Table 10**

**Fixed Effect Regression Results with Dis-aggregated Ownership Variables**

	(1)	(2)
Age	-15.719 (0.000)**	-15.605 (0.000)**
lnSale	18.127 (0.007)**	18.457 (0.007)**
<i>lnSale</i> <sup>2</sup>	6.856 (0.000)**	6.651 (0.000)**
Marketing Intensity	-120.873 (0.354)	-117.760 (0.364)
Advertising Intensity	-250.707 (0.007)**	-220.549 (0.025)*
R&D Intensity	14.826 (0.674)	188.802 (0.442)
Distribution Intensity	-19.352 (0.851)	-35.053 (0.735)
Export Intensity	35.264 (0.042)*	36.376 (0.045)*
Import Intensity	-1.561 (0.001)**	-1.535 (0.001)**
Tax Intensity	-8.539 (0.000)**	-8.289 (0.000)**
Debt Intensity	-119.159 (0.000)**	-118.328 (0.000)**
Capital Intensity	0.167 (0.178)	0.166 (0.177)
Foreign	0.149 (0.798)	0.000 (1.000)
<i>Foreign</i> <sup>2</sup>	-0.010 (0.332)	0.001 (0.966)
Director	-0.833 (0.120)	-0.826 (0.133)
<i>Director</i> <sup>2</sup>	0.019 (0.028)*	0.019 (0.032)*
Corporate	0.098 (0.849)	0.167 (0.764)
<i>Corporate</i> <sup>2</sup>	-0.004 (0.602)	-0.005 (0.535)
Dev.Fin.Inst.	-2.807 (0.077)+	-2.723 (0.106)
<i>Dev.Fin.Inst.</i> <sup>2</sup>	0.093 (0.081)+	0.089 (0.112)
Fin.Inst.	-0.827 (0.331)	-1.272 (0.141)
<i>Fin.Inst.</i> <sup>2</sup>	0.022 (0.238)	0.033 (0.089)+
Govt.	-1.347 (0.314)	-1.798 (0.205)
<i>Govt.</i> <sup>2</sup>	0.024 (0.472)	0.025 (0.470)
Observations	4852	4529
Adjusted R <sup>2</sup>	0.7070	0.6963
Control Group Effect	0.000**	0.000**
Ownership Group Effect	0.021*	0.018+
Total Group Effect	0.000**	0.000**
Time Effect	0.022*	0.012*
Joint Effect	0.000**	0.000**

Numbers in parentheses are p-values of t-statistics. Standard errors are robust to heteroscedasticity. Intercept term is used in the regression but not reported here. + significant at 10%; \* significant at 5%; \*\* significant at 1%. Dependent variable is restricted to lie between 1% 99%. Coefficients reported are: Actual Coefficient\*1000. p-values of F-test for joint significance are reported after Adjusted R<sup>2</sup>.

**Table 11**

**Fixed Effect Regression Results for Sub-samples**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age	-11.785 (0.000)**	-15.209 (0.000)**	-15.776 (0.000)**	-10.273 (0.000)**	-9.572 (0.023)*	-16.574 (0.000)**	-8.048 (0.010)**
lnSale	24.679 (0.002)**	27.998 (0.000)**	23.848 (0.001)**	29.744 (0.568)	28.877 (0.002)**	-10.306 (0.460)	18.202 (0.071)+
<i>lnSale</i> <sup>2</sup>	3.273 (0.001)**	4.440 (0.000)**	6.847 (0.000)**	2.724 (0.470)	8.203 (0.052)+	10.412 (0.000)**	5.412 (0.011)*
Marketing Intensity	67.970 (0.633)	37.271 (0.738)	-91.563 (0.512)	-14.432 (0.940)	105.552 (0.533)	-235.101 (0.164)	95.727 (0.608)
Advertising Intensity	-265.574 (0.041)*	-113.722 (0.145)	-232.634 (0.071)+	-445.958 (0.193)	-159.024 (0.275)	-599.126 (0.114)	-354.389 (0.019)*
R&D Intensity	-48.653 (0.748)	6.666 (0.842)	23.218 (0.458)	42.862 (0.784)	30.134 (0.456)	320.152 (0.479)	316.857 (0.265)
Distribution Intensity	-312.956 (0.018)*	-122.449 (0.168)	1.302 (0.991)	-326.689 (0.118)	-95.609 (0.497)	-482.740 (0.013)*	-321.533 (0.135)
Export Intensity	42.577 (0.003)**	30.311 (0.041)*	24.386 (0.221)	76.621 (0.127)	-21.732 (0.614)	57.860 (0.066)+	38.923 (0.215)
Import Intensity	-2.895 (0.001)**	-1.479 (0.002)**	-8.727 (0.123)	-23.717 (0.292)	-1.277 (0.106)	-71.066 (0.063)+	0.920 (0.695)
Tax Intensity	-27.298 (0.413)	-6.198 (0.001)**	-8.041 (0.001)**	-128.414 (0.114)	-13.141 (0.007)**	-251.413 (0.002)**	-8.751 (0.002)**
Debt Intensity	-99.865 (0.000)**	-122.770 (0.000)**	-117.067 (0.000)**	-77.854 (0.029)*	20.810 (0.659)	-126.748 (0.000)**	-82.457 (0.014)*
Capital Intensity	0.819 (0.010)**	0.390 (0.008)**	0.262 (0.118)	-7.487 (0.265)	0.308 (0.209)	0.046 (0.739)	0.148 (0.579)
Foreign	0.021 (0.967)	0.087 (0.869)	0.106 (0.848)	0.057 (0.931)	1.721 (0.627)	-0.098 (0.906)	-1.689 (0.280)
<i>Foreign</i> <sup>2</sup>	-0.009 (0.305)	-0.010 (0.291)	-0.009 (0.358)	-0.006 (0.546)	-0.015 (0.797)	-0.011 (0.444)	0.020 (0.433)
Institutional	-2.325 (0.100)	-2.123 (0.130)	-2.614 (0.073)+	0.445 (0.781)	0.032 (0.996)	-3.987 (0.021)*	-0.271 (0.942)
<i>Institutional</i> <sup>2</sup>	0.076 (0.116)	0.075 (0.137)	0.079 (0.121)	-0.014 (0.747)	-0.039 (0.846)	0.101 (0.040)*	0.039 (0.859)
Director	-0.196 (0.660)	-0.302 (0.521)	-0.752 (0.165)	0.217 (0.824)	-2.291 (0.228)	-1.962 (0.254)	-0.257 (0.777)
<i>Director</i> <sup>2</sup>	0.008 (0.291)	0.007 (0.317)	0.016 (0.049)*	-0.005 (0.762)	0.039 (0.219)	0.019 (0.548)	0.004 (0.781)
Corporate	0.081 (0.861)	-0.294 (0.527)	0.408 (0.401)	0.094 (0.881)	-3.024 (0.321)	-0.311 (0.636)	0.090 (0.933)
<i>Corporate</i> <sup>2</sup>	-0.004 (0.609)	0.002 (0.724)	-0.008 (0.260)	-0.003 (0.759)	0.053 (0.325)	0.002 (0.838)	-0.003 (0.843)
Observations	4468	4678	4489	1276	1196	1278	1251
Adjusted <i>R</i> <sup>2</sup>	0.6866	0.7230	0.7107	0.7617	0.6018	0.7454	0.7226
Control Group Effect	0.000**	0.000**	0.000**	0.042*	0.011*	0.000**	0.004**
Ownership Group Effect	0.024*	0.013*	0.003**	0.488	0.845	0.157	0.191
Total Group Effect	0.000**	0.000**	0.000**	0.113	0.037*	0.000**	0.003**
Time Effect	0.146	0.118	0.009**	0.314	0.897	0.033*	0.801
Joint Effect	0.000**	0.000**	0.000**	0.0001	0.000**	0.000**	0.000**

Numbers in parentheses are p-values of t-statistics. Standard errors are robust to heteroscedasticity. Intercept term is used in the regression but not reported here. + significant at 10%; \* significant at 5%; \*\* significant at 1%. Dependent variable is restricted to lie between 1% 99%. Coefficients reported are: Actual Coefficient\*1000. p-values of F-test for joint significance are reported after Adjusted *R*<sup>2</sup>.

**Table 12**

**Results of Fixed Effect Regressions with Other Performance Measure**

	(1)	(2)	(3)	(4)	(5)
Age	-9.816 (0.000)**	-9.784 (0.000)**	-67.042 (0.000)**	9.031 (0.622)	-54.835 (0.000)**
lnSale	23.943 (0.000)**	23.959 (0.000)**	-47.020 (0.329)	-29.171 (0.678)	-21.587 (0.251)
<i>lnSale</i> <sup>2</sup>	2.721 (0.000)**	2.628 (0.001)**	92.981 (0.000)**	36.843 (0.001)**	-0.479 (0.881)
Marketing Intensity	-82.848 (0.276)	-97.329 (0.211)	-1,205.298 (0.366)	1,073.651 (0.504)	-38.524 (0.939)
Advertising Intensity	-165.284 (0.157)	-157.540 (0.184)	-671.810 (0.614)	-61.185 (0.973)	-176.495 (0.747)
R&D Intensity	-13.754 (0.922)	-20.518 (0.933)	1,794.078 (0.466)	-4,670.129 (0.442)	723.544 (0.738)
Distribution Intensity	-290.157 (0.001)**	-301.469 (0.000)**	-1,960.169 (0.111)	-139.218 (0.927)	284.365 (0.594)
Export Intensity	46.390 (0.000)**	48.602 (0.000)**	111.744 (0.440)	59.391 (0.829)	3.641 (0.968)
Import Intensity	-1.200 (0.060)+	-1.177 (0.068)+	-2.487 (0.567)	113.094 (0.455)	-8.776 (0.082)+
Tax Intensity	-15.408 (0.591)	-13.051 (0.645)	-375.477 (0.405)	470.812 (0.258)	15.643 (0.893)
Debt Intensity	-63.934 (0.000)**	-65.962 (0.000)**	-17.930 (0.918)	92.140 (0.686)	490.396 (0.000)**
Capital Intensity	0.390 (0.059)+	0.390 (0.055)+	-3.384 (0.020)*	-1.912 (0.379)	-0.129 (0.633)
Foreign	0.018 (0.965)	-0.484 (0.424)	-1.794 (0.861)	4.532 (0.681)	-0.147 (0.965)
<i>Foreign</i> <sup>2</sup>	-0.010 (0.205)	0.008 (0.624)	-0.091 (0.732)	0.361 (0.210)	0.056 (0.535)
Institutional	-1.735 (0.064)+	-1.919 (0.049)*	-35.110 (0.019)*	-34.035 (0.067)+	3.105 (0.571)
<i>Institutional</i> <sup>2</sup>	0.049 (0.100)+	0.054 (0.079)+	0.926 (0.061)+	0.999 (0.073)+	-0.087 (0.594)
Director	-0.169 (0.654)	-0.146 (0.700)	-3.677 (0.506)	-5.477 (0.357)	-2.534 (0.225)
<i>Director</i> <sup>2</sup>	0.005 (0.447)	0.004 (0.529)	0.062 (0.498)	0.135 (0.234)	0.069 (0.056)+
Corporate	0.247 (0.500)	0.123 (0.748)	1.048 (0.837)	13.457 (0.066)+	-0.296 (0.883)
<i>Corporate</i> <sup>2</sup>	-0.007 (0.146)	-0.006 (0.285)	-0.105 (0.146)	-0.104 (0.310)	0.027 (0.361)
Observations	4096	3871	3814	3354	3833
Adjusted <i>R</i> <sup>2</sup>	0.678	0.6790	0.8366	0.6901	0.5723
Control Group Effect	0.000**	0.000**	0.000**	0.000**	0.000**
Ownership Group Effect	0.015*	0.008**	0.000**	0.000**	0.037*
Total Group Effect	0.000**	0.000**	0.000**	0.000**	0.000**
Time Effect	0.309	0.466	0.992	0.000**	0.000**
Joint Effect	0.000**	0.000**	0.000**	0.000**	0.000**

Numbers in parentheses are p-values of t-statistics. Standard errors are robust to heteroscedasticity. Intercept term is used in the regression but not reported here. + significant at 10%; \* significant at 5%; \*\* significant at 1%. Dependent variable is restricted to lie between 1% 99%. Coefficients reported are: Actual Coefficient\*1000. p-values of F-test for joint significance are reported after Adjusted *R*<sup>2</sup>.

**Table 13**

**Tests for Ownership Variable's Endogeneity**

	(1)	(2)	(3)	(4)
Age	-20.328 (0.000)**	-14.129 (0.011)*	-15.524 (0.000)**	-17.180 (0.000)**
lnSale	13.547 (0.456)	27.704 (0.000)**	32.275 (0.000)**	53.524 (0.002)**
<i>lnSale</i> <sup>2</sup>	5.952 (0.038)*	5.669 (0.000)**	4.724 (0.000)**	4.084 (0.039)*
Marketing Intensity	83.546 (0.774)	-166.093 (0.245)	-111.808 (0.144)	-300.489 (0.028)*
Advertising Intensity	90.236 (0.893)	-97.867 (0.594)	-250.595 (0.000)**	-367.338 (0.001)**
R&D Intensity	535.019 (0.639)	14.103 (0.857)	2.062 (0.977)	-6.940 (0.896)
Distribution Intensity	-173.088 (0.689)	-135.059 (0.356)	-34.545 (0.598)	-36.964 (0.827)
Export Intensity	-29.349 (0.663)	5.211 (0.866)	24.935 (0.030)*	-1.608 (0.953)
Import Intensity	-15.097 (0.746)	-2.485 (0.000)**	-2.014 (0.000)**	0.563 (0.850)
Tax Intensity	35.826 (0.792)	-24.888 (0.580)	-8.308 (0.056)+	-295.026 (0.112)
Debt Intensity	-94.191 (0.131)	-113.605 (0.000)**	-111.412 (0.000)**	-145.286 (0.000)**
Capital Intensity	0.133 (0.695)	0.447 (0.007)**	0.583 (0.000)**	0.707 (0.028)*
Foreign	0.134 (0.981)	0.528 (0.303)	0.288 (0.464)	0.597 (0.447)
<i>Foreign</i> <sup>2</sup>	0.019 (0.825)	-0.020 (0.035)*	-0.012 (0.075)+	-0.017 (0.266)
Institutional	54.934 (0.169)	-7.129 (0.018)*	-2.905 (0.003)**	-3.001 (0.031)*
<i>Institutional</i> <sup>2</sup>	-1.819 (0.175)	0.217 (0.040)*	0.097 (0.002)**	0.079 (0.065)+
Director	-5.313 (0.512)	-0.161 (0.777)	-0.438 (0.249)	-0.629 (0.372)
<i>Director</i> <sup>2</sup>	0.084 (0.567)	0.005 (0.650)	0.012 (0.054)+	0.012 (0.330)
Corporate	-4.282 (0.471)	-0.319 (0.521)	0.194 (0.521)	0.209 (0.692)
<i>Corporate</i> <sup>2</sup>	0.058 (0.465)	0.002 (0.789)	-0.005 (0.228)	-0.005 (0.507)
Observations	1175	1987	4949	5035
Adjusted <i>R</i> <sup>2</sup>	0.1666	0.1560		
Time Effect		0.138		

**Instrumented :** Foreign *Foreign*<sup>2</sup> Institutional *Institutional*<sup>2</sup> Director *Director*<sup>2</sup> Corporate *Corporate*<sup>2</sup>

Test of over identifying restrictions

0.8416

Davidson-MacKinnon test of exogeneity

0.5072

Numbers in parentheses are p-values of t-statistics. Standard errors are robust to heteroscedasticity.

Intercept term is used in the regression but not reported here. + significant at 10%; \* significant at 5%; \*\* significant at 1%.

Dependent variable is restricted to lie between 1% 99%. Coefficients reported are: Actual Coefficient\*1000.

p-values of F-test for joint significance are reported after Adjusted *R*<sup>2</sup>.

**Table 14**

**Results of Regression for Dominant Owner Group**

	(1)
Age	-15.772 (0.000)**
lnSale	19.270 (0.002)**
<i>lnSale</i> <sup>2</sup>	6.463 (0.000)**
Marketing Intensity	-94.875 (0.465)
Advertising Intensity	-251.074 (0.005)**
R&D Intensity	16.562 (0.632)
Distribution Intensity	-26.893 (0.786)
Export Intensity	22.006 (0.192)
Import Intensity	-1.529 (0.001)**
Tax Intensity	-8.865 (0.000)**
Debt Intensity	-109.288 (0.000)**
Capital Intensity	0.200 (0.146)
Max Foreign	0.595 (0.397)
<i>MaxForeign</i> <sup>2</sup>	-0.014 (0.198)
Max Institutional	-3.535 (0.142)
<i>MaxInstitutional</i> <sup>2</sup>	0.094 (0.192)
Max Director	-0.805 (0.202)
<i>MaxDirector</i> <sup>2</sup>	0.019 (0.033)*
Max Corporate	0.033 (0.959)
<i>MaxCorporate</i> <sup>2</sup>	-0.002 (0.843)
Observations	5017
Adjusted <i>R</i> <sup>2</sup>	0.707
Control Group Effect	0.000**
Ownership Group Effect	0.010*
Total Group Effect	0.000**
Time Effect	0.027*
Joint Effect	0.000**

Numbers in parentheses are p-values of t-statistics. Standard errors are robust to heteroscedasticity. Intercept term is used in the regression but not reported here. + significant at 10%; \* significant at 5%; \*\* significant at 1%. Dependent variable is restricted to lie between 1% 99%. Coefficients reported are: Actual Coefficient\*1000. p-values of F-test for joint significance are reported after Adjusted *R*<sup>2</sup>.

Table 15: Formula for Construction of Ownership Variables

Definition of the ownership variables prior and after March, 2001 with reference to Note 7. We do not find one to one correspondence from earlier definition to the new definition for some of the ownership variables used in the study. —	
As per disclosure prior to March, 2001	
Variable	Construction of the ownership variable
Foreign holdings (Foreign)	Total Equity Holding (Foreign) + Foreign Equity (Collaboration)
Institutional Investors (Institutional)	Financial Institutions
Govt. / Financial institutions	
Development Financial Institutions (Dev. Fin. Inst.)	State Financial Corporations Equity Holding
Govt. Cos. (Govt.)	Government and Government Companies Equity Holding
Financial Institutions (Fin. Inst.)	Financial Institutions Equity Holding - State Financial Corporations Equity Holding
Corporate bodies (Corporate)	Equity Holding (Corporations) + Other Corporate Bodies Equity Holding
Directors (Director)	Directors and their Relatives Equity Holding + Indian Promoters Equity Holding + Foreign Promoters Equity Holding
Other top 50 share holders (not covered above)	Equity Holding of other Top50 Shareholders
Others including Indian Public	Others Equity Holding
Total Equity Holding	Total Equity
As per new disclosure pattern since March, 2001	
New Variables	Nearest Mapping with Old Ownership Variables
Promoters Equity Holding	Indian Promoters Equity + Government and Government Companies Equity + Other Government Equity + Foreign Equity (Collaborator) + Foreign Equity (Promoters)
Indian Promoters Equity Holding	Indian Promoters Equity + Government and Government Companies Equity + Other Government Equity
Private Equity Holding	Indian Promoters Equity
Government Equity Holding	Government and Government Companies Equity + Other Government Equity
Foreign Promoters/Collaborator's Equity Holding	Foreign Promoters Equity Holding + Foreign Collaborator's Equity Holding
Institutional Investors Equity Holding	Foreign Institutions Equity Holding (FIIs) + Financial Institutions Equity Holding
Private Corporate Bodies Equity Holding	Indian Public's Equity Holding + Foreign Individuals Equity Holding + Corporations Equity Holding + Directors and their Relatives Equity Holding + Equity Holding of other Top50 Shareholders)
Others including Indian Public	Others Equity Holding
Total Equity Holding	Total Equity