Impact of Board Characteristics on Firm Performance: A comparison of private sector firms with SOEs in India

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1. Introduction

Over the last three decades, the Government of India (GOI) has undertaken several reform measures to improve the profitability and efficiency performance of state owned enterprises (SOEs) in India. The reform measures undertaken have focused on improving the transparency and accountability of the management of SOEs[1], increasing exposure to competition[2], imposing of hard budget constraint, increasing access to capital markets[3] and adopting best practice in corporate governance (CG) among others (Public Enterprise Survey, 2013). The *Guidelines for Corporate Governance* (2010) was standardized for implementation in all SOEs by GOI in 2010[4]. Though these guidelines covered all the SOEs under their purview, the SOEs that were listed with the Indian capital markets were expected to comply by the corporate governance regulations of Securities and Exchange Board of India (SEBI) guidelines under Clause 49. The Clause 49 of listing agreement among other norms included the norms relating to definition, role and responsibility of board of directors (Sarkar and Sarkar, 2012). The dead line set for implementing these norms for the listed firms (for both private sector firms and SOEs) were January 2006. It has been seven years since these corporate governance reforms have been implemented in the listed SOEs and private sector firms in India. Scanning the empirical literature we find studies that have analyzed the impact of adherence to these norms on the performance of private sector firms in India[5]. To the best of our knowledge, no study in the literature has so far analyzed the impact of these reforms on SOE performance in the Indian context. The present study undertakes to do this. The objective of the present study is to compare the board characteristics in terms of board independence and board size on SOE and privately owned firm performance within a single empirical framework in the context of India.

The sample analyzed includes a comparable sample of listed Indian private sector firms and SOEs, matched by industrial classification codes (NIC) and size for the study period 2006 to 2013. Results indicate that the relationship of board structure and firm performance is impacted by ownership differentials.

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[1] Like Memorandum of Understanding (Mou) system implemented in SOEs since 1988-89; partial disinvestment of central government equity shares to private parties and employees undertaken since 1991-92

[2] Reform strategies like liberalization in 1991 and subsequent deregulation of industries earlier reserved for SOEs

[3] Listing of SOEs on Bombay Stock Exchange and National Stock Exchange since 1994

[4] The first guidelines were issued on experimental basis in 2007 (*Guidelines on Corporate Governance for Central Public Sector Enterprises,* 2007)

[5] For detailed literature review regarding various components of corporate governance reform particularly for India see Sarkar and Sarkar (2012)

The rest of the paper is organized as follows. Section 2 gives the relevant background literature followed by section 3 that gives a brief note on SOE reform in India. Section 4 details the methodology with details on sample data (section 4.1), variables used in the analysis (section 4.2) and empirical methodology (section 4.3). Results of the estimation are discussed in section 5 followed by concluding remarks.

2. Relevant Background Literature:

Board of directors is considered as one of the most important internal control mechanism of corporate governance used to control the agency problem arising in firms due to the separation of the ownership rights and control in the modern corporations (Fama and Jensen, 1983; Jensen and Meckling, 1976). The managers, who control the operational aspects of the firm by virtue of their firm-specific knowledge and managerial expertise, have an advantage over the firm owners (Mizruchi, 1988). Managers may gain by pursuing actions to benefit their own interests at the cost of the interest of shareholders. The possibility of conflict of interest between managers (agents) and owners (principal) necessitates putting in place monitoring mechanisms that are designed to protect the owners interests (Fama and Jensen, 1983; Jensen and Meckling, 1976). One of the primary task of the board of directors is to serve this monitoring function.

It is further argued that the board is more effective in performing its monitoring role when the board constitutes outside directors and particularly independent members, who are concerned about maintaining their reputation in the external labour market and avoid being sued by shareholders (Bhagat et al., 1987; Fama, 1980; Sarkar, 2010; Weisbach, 1988). Further support for outside directors is found in the argument of resource dependence theorists (Pfeffer, 1972; Stearns and Mizruchi, 1993), who point out that the outside directors act as resources of critical links to the external environment who promote interfirm linkages and provide access to valued resources and information to the firm, which is particularly useful to the firm at times of external adversities (Bazerman and Schoorman, 1983; Provan, 1980; Stearns and Mizruchi, 1993; Pfeffer and Salancik, 1978; Daily and Dalton, 1994a, 1994b; Sutton and Callahan, 1987; Zahra and Pearce, 1989; Dalton et al., 1998). Also outside directors act as experts who may provide useful counsel to CEOs on strategic initiatives affecting the firm as a whole, which is otherwise not available from other corporate staff (e.g see Zahra and Pearce, 1989/ Dalton, et al., 1998).

Contrary to the above viewpoint are contenders of stewardship theory (Donaldson and Davis, 1991, 1994)[6], who argue that managers are 'good stewards' of the firm, whose actions are always focused towards attaining high levels of corporate profit and shareholder returns. Also as argued by few others (e.g, Morck, 2004; Fink, 2006), the independence of independent directors is questionable, given that the CEOs play a critical role in appointment of these directors. Arguing for alternate governance mechanisms like active capital market development and competition in product market, several in the literature (e.g, Mace, 1986; Patton and Baker, 1987) point out that external corporate governance mechanism are more effective in disciplining the management as compared to internal mechanisms like board structure and composition. In empirical studies, board independence is largely measured using a combination of the measures such as percentage of board directors who are either insiders or outsiders or affiliated or independent/interpdependent directors (e.g, meta analysis by Dalton et al, 1998). While each study differs in specificity of measurement, largely studies focus on capturing the independence of board of directors from the firms and its management, specifically the CEO.

One other board characteristic that has been extensively studied in the empirical literature is the relationship between board size and firm performance. With regard to board size several in the literature argue that larger board size results in less efficient function of the boards due to coordination and process problems among larger groups of people (Jensen, 1993; Lipton and Lorsch, 1992). Jensen (1993) claims that firms with board size greater than seven or eight members function inefficiently and are easier for CEO's to control and manipulate. On the other hand, proponents supporting larger board size argue that with increased number of directors, the firm has a larger pool of expertise to draw on and help improve strategic decision making in the firms (e.g, Pearce and Zahra, 1992).

Empirical studies on the relationship between board independence, board size and board performance are as yet inconclusive. While there are studies that have found significant impact for board independence and board size on firm performance, there are those that have not found any significant impact of board independence and board size on firm performance (for example see Sarkar and Sarkar, 2012; Bhagat et al., 2008; Walsh and Seward, 1990 ; Also see Dalton et al., 1998; Dalton and Dalton, 2011; Rhodes et al., 2000; Wagner, Steimpert and Fubara, 1998 among others for meta-analysis). Research so far has focused almost exclusively on the private sector firms, with very few studies focusing on the impact of board structure on SOE performance (e.g., Tusiime, Nkundabanyanga and Nkote, 2011; Bozec and Dia, 2007; Mwaura, 2007) with several studies focusing particularly on Chinese SOEs (like., Hu etal., 2013; Jiang, Huang and Kim, 2013). To the best of our knowledge, there is no study in the literature that has

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[6] For a comparative review of agency theory and stewardship theory, see Davis, Schoorman and Donaldson, 1997)

empirically compared the impact of board characteristics on SOE and privately owned firms within a single empirical framework.

SOEs, over the last three decades, have faced criticism for their poor performance as compared to the private sector firms across countries including both developed and emerging economies (Keketi et al., 1994). Varying theoretical viewpoints (property rights theorists, public choice theorists among others) in the literature have sought to explain the poor performance of the SOEs differently. While the property rights theorists (Alchian, 1977; De Alessi, 1987) argue that it is the absence of market for ownership rights and lack of threat of corporate control for SOEs that make them inherently less efficient than their private sector counterparts, the public choice theorists (Estrin and Perotin, 1991; Shleifer, 1994; Shleifer and Vishny, 1994; Levy, 1987; Niskanen, 1975) argue that the inbuilt inefficiency of SOEs is due to the discretionary authority and control exercised by the caretakers of SOEs, namely the politicians and government bureaucrats, on the rights over the wealth of the PSEs to further their own rent seeking activities. Counter to this viewpoint are those who argue that the SOEs are inefficient because of their operating inefficiencies that exist in the environment in which these firms operate (Ghosh, 1997; Jones, 1991; Shirley and Xu, 1998 and Trivedi, 1990). It is further argued that if these inefficiencies like the lack of autonomy to top management in decision making, lack of accountability of top management towards performance of the firm, protection from product market competition, non access to capital markets for raising funds and lack of capital market discipline, to name a few, were removed, SOEs would become as good as their private sector counterparts. Consistent with their argument, the supporters of environment and enterprise level reforms recommend policy strategies including liberalization of the economy, export promotion, dereservation, deregulation, promotion of efficient capital markets, hard-budget constraint, implementing performance contract system for top management, professionalization of board structure through corporate governance reforms of SOEs among others. Following the various recommendations since early 1980's reform measures have been undertaken in almost all countries that had government ownership in some form or other, though specificity of reforms differ from country to country[7]. India is one country which undertook a whole gamut of reforms including both ownership change on one hand and implementation of environmental and enterprise level reforms in their SOEs on the other hand.

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[7] See for e.g., kikeri et al., (1994), Megginson (2005), Nellis (1996), Earle, Estrin and Leshchenko (1996) and Bennett et al., (2001) among others for privatization reforms. Also see Country level analysis are found in World Bank (1995) ; Shirley and Xu(1998), Bhaumik and Dimova, (2004) and Sarkar et al., (1998) among others for environmental and enterprise level reforms adapted in different countries.

The objective of the present study is to compare the board characteristics in terms of board independence and board size on SOE and privately owned firm performance within a single empirical framework in the context of India. India makes an interesting case study where following the New Industrial Policy of 1991, a whole gamut of reforms including ownership change, environmental and enterprise level reforms were undertaken in SOEs with a view of bringing the SOEs on a level playing field with their private sector counterpart. One such reform strategy adopted was the corporate governance guidelines for SOEs. For all listed SOEs it was made mandatory that they comply by the corporate governance regulations of SEBI guidelines under Clause 49, which was made mandatory for all private sector listed firms in 2006. The Clause 49 of listing agreement among other norms included the norms relating to definition, role and responsibility of the board of directors[8].Scanning the empirical literature for studies specifically undertaken in the Indian context, we find several empirical analysis that have studied the relationship between board structure and firm performance (e.g., see Sarkar and Sarkar, 2012). Largely the studies have analyzed the relationship between board characteristics, such as board independence, board size and firm performance. The overall empirical evidence, similar to that found for the international experience is found to be inconclusive for India. While there are studies that find board characteristics to significantly impact firm performance, there are others who do not find any significant impact of board characteristics on firm performance (e.g, see Sarkar and Sarkar, 2012 for detailed literature review on the relationship between various board components and firm performance; also see for e.g., Van Essen, Van Oosterhout, and Carney, 2012 for meta- analysis on Asian studies). In Indian context, there is no study to the best of our knowledge, in the literature that has empirically analyzed the impact of board characteristics on SOEs performance or done a comparative study of these relationships between SOEs and private sector firms. Our study tries to do this in comparing the impact of board characteristics like board independence and board size on the performance of SOEs and private sector firms in a single unified empirical framework.

It is hypothesized that irrespective of ownership differentials, board independence would have significant positive impact on firm performance and board size would have a negative impact on firm performance. Board independence is measured using two variables; *Board Exe* and *Board Ind*. While *Board Exe* is defined as the percentage of number of executive directors to total board members, *Board Ind* is defined as the percentage of board members who are independent to total board members. Firm performance is measured using market based indicator Tobin's Q. Similar performance variables have been used by several in the literature particularly in Indian context (e.g, Sarkar and Sarkar, 2000; Dharmapala and Khanna, 2013; Jackling and johl, 2009).

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[8] For details on Clause 49, its development and implementation in India see Sarkar and Sarkar (2012)

One other variable of interest is government nominees on boards of SOEs and private firms. While government nominated directors are considered as independent directors for private sector firms, in government owned SOEs these appointments are considered as inside directors. Similar definition is adopted by the corporate governance regulations implemented for SOEs under Clause 49 of listing agreement by SEBI (*Guidelines on Corporate Governance for Central Public Sector Enterprises,* 2007). It is argued for private sector firms where government nominees are considered independent directors that such appointments on boards of corporate have advantage of obtaining favourable regulatory climate that sometimes determine the operating success of these firms (Pfeffer, 1972). Also brokering relationship with politicians and public officials is seen to help firms get access to rent-generating opportunities such as untendered government contracts, licenses, softloans, and inside information about the availability of lucrative business ventures (Luo and Junkune, 2008). Thus the appointment of government nominees on private sector boards is expected to have positive impact on firm performance. On the other hand, for SOEs, these appointments are seen as a way of increasing the involvement of government bureaucrats and politicians in the SOEs, who are contended to be the main cause of SOE inefficiencies. The government bureaucrats and politicians, as pointed out by public choice theorists (like Estrin and Perotin, 1991; Shleifer, 1994; Shleifer and Vishny, 1994; Levy, 1987; Niskanen, 1975) are seen to use their control over the wealth of SOEs to further their own interests at the cost of firm's performance.

Thus following from the above arguments, the relationship between government nominee directors and firm performance is argued to varys depending on ownership structure of the firm. While the performance of government nominee directors on SOE boards is contended to negatively impact the firm performance, their presence is expected to have positive impact on private sector firm performance. In our present study, we also analyze the performance impact of the percentage of government nominee directors on the boards of private sector firms and SOEs. The next section gives a brief background of the reform strategies adopted in Indian SOEs including the corporate governance reform in SOEs.

3. SOE reforms in India: Brief note

In response to declining trends in SOEs[9], Government of India undertook reforms in late eighties. It was the financial crisis of 1991 and the adaption of the New Industrial Policy that gave the much needed thrust to these reforms. Following liberalization of the economy in 1991, Central government undertook phased

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[9]For detailed discussion see Reports/ Recommendation of Various Committees on Public Enterprises(1990)

reforms in the SOEs with implementation of disinvestment of its central government equity shares to private sector owners in 1992. Since then Government has earned over Rs. 150 billion[10] through partial or full disinvestment. Government has also implemented the performance contract system (Memorandum of Understanding) through which it granted greater autonomy to top management[11] along with encouraging SOEs to list themselves on Indian stock exchanges (since 1994[12]), dereserving sectors that were earlier monopolized by SOEs (since 1991)[13] and implementing guidelines for corporate governance norms to be followed by SOEs (since 1997) among others. The professionalization of SOE board of management was highlighted in the Memorandum of Understanding (MoU) system in 1997 when under the MoU system, one of the important precondition established for the delegation of decision making powers to some of the large and important companies like the 'Navratna" companies was that, the boards of these firms be restructured to include at least four non-official or independent directors (Guidelines on Corporate Governance for Central Public Sector Enterprises, 2007). While the initiation of best practice norms was done in 1997, a more comprehensive guideline on corporate governance of SOE was issued by GOI in 2007, nearly a decade later[14]. These guidelines were implemented on voluntary experimental basis in the SOEs until 2010, when with some minor revisions, the corporate governance guidelines have become mandatory for all SOEs owned by central government of India (Guidelines on Corporate Governance for Central Public Sector Enterprises, 2010). Though these guidelines covered all the SOEs under their purview, the SOEs that were listed with the capital markets (Bombay Stock Exchange and National Stock Exchange) were expected to comply by the corporate governance regulations of SEBI guidelines under Clause 49 of listing agreement which set the norms relating to definition, role and responsibility of board of directors[15]. All listed firms were to comply by these norms by January 2006. Specifically the guidelines for the composition of board of directors in SOEs included the following guidelines (Guidelines on Corporate Governance for Central Public Sector Enterprises, 2010):

- Full time functional directors should not exceed 50% of the actual strength of the board
- The number of government nominated directors should not exceed 1/6th of the actual strength of the board and that in no case the number should exceed two directors. The directors are not considered independent directors.

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[10] 1 billion = 100 crores
[11] Memorandum of Understanding started in 1988-89 and was formalized in 1991-1992. By 2007-08 all SOEs were brought under this system.
[12] 44 SOEs of the 210 are listed on the BSE and NSE as of 2013.
[13] Of the 17 areas reserved for investment by the public sector since 1956, the government in 1991 dereserved 9. Over time the number of reserved sectors has been reduced to only 3, which includes military equipment, atomic energy and railway transport.
[14] Guidelines on Corporate Governance for Central Public Sector Enterprises (2007)
[15] For details see Sarkar and Sarkar (2012)

- In companies with non-executive chairman at least $1/3^{rd}$ of the board should comprise of independent directors (also called non-official part-time directors) and in cases of companies with executive chairman at least ½ of the board should comprise of independent directors. The definition of independent directors is as given in Clause 49 of SEBI guidelines on corporate governance.

As of 2012, there are over 260 centrally owned SOEs (Public Enterprise Survey, 2011-12), operating in key manufacturing and service sectors including industrial sectors like agro based industries, mining, power generation and transmission, petroleum, fertilizers, pharmaceuticals, transport, telecommunication, financial services including insurance among others. These enterprises were created to cater to employment generation and infrastructure network development needs of post independent India and were envisioned as vehicles for industrial and regional development in the country. SOEs remain important contributors to the economy even today with employment of over14 lakh people in 2011-12 (Public Enterprise Survey, 2011-12) and contributing nearly 23 percent to India's national gross domestic product[16] in the same year (Handbook of statistics on Indian economy, 2012-13). As on 2013, 44 SOEs are listed across the Indian stock exchanges. These listed SOEs form the scope of our analysis in this study where we are trying to compare the performance impact of corporate governance reform on SOEs and private owned listed firms. Specifics of the sample data and variables included along with the empirical methodology for estimation is described next.

4. Data, Variables and Empirical Methodology

4.1 Data:

The data for the study is sourced from Prowess, a database created by the Center for Monitoring Indian Economy (CMIE). Information available includes data from the profit and loss accounts, balance sheets and also corporate governance reports of companies that are listed or otherwise. Our study intends to include all the listed firms for the period 2006-2013. To get a comparable sample of listed private sector firms for the listed SOEs, the firms were matched by industrial classification codes (NIC) and size. For the listed SOEs, under manufacturing and service sector (excluding financial services), we first extracted all the SOEs and their Industrial Classification (NIC) codes from Prowess. The NIC codes represent the codes for various industries given by the Central Statistical Organization under the Government of

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[16] GDP is measured at factor cost in 2004-05 constant prices.

India, where the number of digits indicates the level of disaggregation within an industry. For most SOEs, a 5 digit NIC classification code was obtained. SOEs that were found to produce products classified into more than one 5 digit classification code, codes were grouped under more aggregate level NIC classification code. A matching sample of listed private owned firms was obtained from the same database by including all the firms under the domestic private ownership belonging to the specific NIC categories. This matching was done for each year in the sample period as not all firms were listed throughout the sample period either because some firms got listed on the stock exchanges after 2006 or because some firms got delisted in the sample period of 2006-13. Our sample includes for each year, only those firms that were listed on the stock exchanges. Those industry groups were included that had at least one SOE and one domestic private owned firm. The analysis excludes those SOEs that belong to monopoly industry with market share of 100 percent. Further making the sample comparable by size, we included only those firms whose asset size was in the range of top 40 percentile asset distribution of the industry (NIC classification) in which the firm belonged for a particular year. Thus our sample data of Indian owned domestic private sector firms is matched with the SOEs by size within industry groups defined by NIC codes for each year in the sample period. Thus our sample data consists of large sized firms comparable at industry level for each year in the sample period. In the last filtering of firms, we dropped the NIC groups where there was either only SOE firm or domestic private firm with market share of 100 percent in the large sample set (defined as firm with top 40% of asset size in the industry). In all 33 SOEs and 356 private sector firms are included in the data set, covering 26 industry groups. Data for some of the variables were found to be missing for some years. Also corporate governance reports that were used to construct the variables reflecting board structure (these are our main variables of interest in the study) was not available in Prowess for all firms for all the sample years. Hence those data points were lost where these variables were found missing for the firm in a particular year, giving us an unbalanced panel with 1,820 firm observations, of which 214 were for SOEs and 1,607 were for domestic private owned firms for the study period 2006-13. Table (1) below gives list of industry groups included in the dataset along with the percentage of SOEs and private firms included under each industry group. The values in the bracket indicate the number of firms. The table shows that there is a relatively even spread of industry groups and ownership structure across industry groups represented in the study.

Table 1: Percentage of SOE and private sector firms by Industry groups included in the dataset (Values in parenthesis indicate number of firms)

Industry	SOEs	Private firms	Total
	% in industry total (number of firms)		% in Sample total (no. of firms)
Extraction of Crude Petroleum and Natural Gas	50.00 (4)	50.00 (4)	0.44(8)
Mining of Iron Ores	50.00(8)	50.00(8)	0.88(16)
Manufacturing, Processing and Blending of Tea	88.41(61)	11.59(8)	3.79(69)
Manufacture of other petroleum products	25.81(8)	74.19(23)	1.70(31)
Manufacture of organic and inorganic chemical compounds	92.35(181)	7.65(15)	10.76(196)
Manufacture of other fertilizers	82.22(37)	17.78(8)	2.47(45)
Manufacture of photographic plates, films, and other related products	55.56(5)	44.44(4)	0.49(9)
Manufacture of medicinal substances used in the manufacture of pharmaceuticals	66.67(2)	33.33(1)	0.16(3)
Manufacture of hot-rolled and cold-rolled products of steel	95.51(170)	4.49(8)	9.77(178)
Manufacture of Copper, copper products and alloys	75.76(25)	24.24(8)	1.81(33)
Manufacture of tractors	86.89(53)	13.11(8)	3.35(61)
Diversified industry group	84.44(38)	15.56(7)	2.47(45)
Electric power generation by hydroelectric power plants	42.86(6)	57.14(8)	0.77(14)
Electric power generation by non-coal based thermal (e.g. diesel, gas)	95.00(152)	5.00(8)	8.79(160)
Construction of buildings	50.00(11)	50.00(11)	1.21(22)
Construction of utility projects	50.00(7)	50.00(7)	0.77(14)
Activities of commission agents dealing in wholesale trade	96.88(93)	3.13(3)	5.27(96)
Transport via pipeline	84.95(79)	15.05(14)	5.11(93)
Other sea and coastal water transport	85.59(95)	14.41(16)	6.10(111)
Storage and warehousing	50.00(8)	50.00(8)	0.88(16)
Hotels and Motels, inns, resorts providing short term lodging facilities	75.76(25)	24.24(8)	1.81(33)
Activities of basic telecom services	78.38(29)	21.62(8)	2.03(37)
Trusts, funds and other financial vehicles	95.17(138)	4.83(7)	7.96(145)
Other credit granting	50.00(1)	50.00(1)	0.11(2)
% in Total	88.25(1,606)	11.75(214)	100.00(1820)

Source: Authors sample data calculations

4.2 Variables:

There are three sets of variables used in the analysis: performance variable, variables of interest and control variables. They are each defined below.

Performance variable:

The firm performance is measured using market based indicator *Tobin's Q*. Preference to market based indicators as compared to accounting based indicators such as return on asset or return on sales, is found in the literature (see Sarkar and Sarkar, 2000; Sarkar, 2011) as market based indicators are seen to better reflect the overall financial health of a company by capturing both the current information with regard to a firms performance and its future prospects. Also, market-based indicators are based on the valuation of the firm by large number of independent investors, as compared to accounting based firm performance indicators that are largely influenced by the country or company specific accounting practices. Further supporting market based indicators Sarkar (2011) point out that there is no uniform accounting standards followed by companies in emerging economies like India as is found in the US, where accounting standards are set by Accounting Standards Board. The present study measures firm performance using market based indicator Tobin's Q, a measured adopted by several studies related to India in the literature (like Sarkar and Sarkar, 2000; Dharmapala and Khanna, 2011; Jackling and johl, 2009 among others). Tobins Q is defined as the ratio of market value of equity and market value of debt to replacement cost of asset. As pointed out by Sarkar (2011), for emerging economies the general practice is to proxy the Tobin's Q by taking book value of debt and book value of assets rather than the market values. This is because, most companies in emerging economies are seen to report asset values in historical costs rather than at replacement costs and also large proportion of corporate debt are institutional debt that is not actively traded in the debt market. A similar definition is used by several studies in the literature for emerging markets (see Sarkar, 2011; Van Essen, Van Oosterhout and Carney, 2012 for a review). Our study also defines Tobin's Q as the ratio of market value of equity and book value of debt to book value of assets. We also use one other performance measure as robustness check- Market to Book Value Ratio (MBVR), defined as the ratio of the product of number of equity shares and average closing price of the share for the financial year to book value of equity and reserves. Similar performance indicator has been used by studies in the literature specifically for India (see Sarkar, 2011 among others)

Variables of Interest:

Our main variables are the variables that define the board characteristics. These are defined below:

Board Size   : defined as the total number of directors on the board

Board Ind   : defined as percentage of board members who are non-executive independent directors

Board Exe   : defined as percentage of board members who are executive directors

Board GNom   : defined as percentage of board members who are nominated by government

Control Variables:

Control for ownership differentials is included in our analysis in the *SOE Dummy*, that takes the value '1' for firms under central government ownership and '0' for firms under Indian domestic private sector ownership. In addition, we control for a number of variables that may influence the firm performance. These include variables that capture the impact of Size of the firm, leverage, age, export intensity, depreciation intensity, advertisement intensity, R & D intensity, market share and dummies indicating industry and year effects. Each variable is described below:

Size: To reflect the effect of unobserved factors that are related to size, log value of firm sales is introduced in the regression. As pointed out in the literature (Majumdar, 1998 and Sarkar and Sarkar, 2000), in the product market, size reflects possible entry barrier that might result from economies of scale. Size also reflects the extent of market power of a company. It is postulated to have positive impact on firm performance.

Leverage : It is defined as the ratio of long-term debt to total equity plus reserves and is expected to capture the corporate tax shield existing in India. Until recently, returns to equity were subjected to double taxation in India, which made debt finance relatively less costly than equity finance (Sarkar, 2011).

Age is defined as the number of years since incorporation till 2013 (last year of sample period).

Export intensity: It controls for the effects of exposure to international competition. It is defined as proportion of exports to total sales and is expected to have positive impact on firm performance.

Depreciation intensity: Defined as the ratio of depreciation expenditure to sales, it proxies for capital intensity of the company's technological process.

AdInt : Defined as the ratio of advertisement expenditure to sales, is expected to capture the effect of intangible assets wherein companies that incur high advertisement expenditure may be successful in building up brand image and thus creating entry barriers for its competitors.

Market share : This reflects the competitive position of a firm in an industry. It is defined as the ratio of firm sale to total industry sales. The variable is expected to have a positive impact on the firm performance.

R&D_sales: defined as expenditure on research and development to sales.

Year dummies: These are included to capture other economy wide shocks which might have an impact on firm performance, but have not been fully accounted for by the other variables

Industry dummies : These are included in the analysis to control for industry specific effects. Among other things, these variables control for differences in the growth opportunities and the riskiness of different industries

4.3 Estimation Model:

The relationship between board structure and firm performance is estimated using the following model:

$$Tobins\ Q_{it} = \alpha + \beta' X_{it} + \gamma' Z_{it} + u_{it}$$

Where X_{it} refers to the variables of interest that include the variables defining board structure, Z_{it} refers to control variables and u_{it} refers to the usual random component included in stochastic regression models. There are several methods that are used in the literature to estimate the impact of board structure on firm performance. Including group dummies for ownership groups (SOEs) limits our choice of empirical methodology. One such empirical methodology that is widely used in the literature to estimate the impact of a board structure on a panel of firm-year observations is the fixed effects panel data model, where the firm specific, unobserved characteristics of the firm that remain constant over the years is

accounted for by firm specific dummies. In our estimation, incorporation of ownership dummies for SOE restricts this possibility as inclusion of firm fixed dummy variables along with ownership dummies that remain fixed over the years for a firm result in multicollinearity. We estimate our model using group fixed effects model also known as pooled OLS with group dummies. Similar methodology has been adopted by several studies that analyze the impact of ownership dummies on firm performance (see Sarkar 2011for review). Further in our analysis, to capture the differential impact of board characteristics on SOE performance as compared to their private sector counter parts, we include interaction terms in our regression analysis. We estimate three variants of the general model given above. The details are as follows:

Analysis I: In this analysis we include the variables that capture the average impact of board characteristics on firm performance. These include '*Board Size*', '*Board Exe*' and '*Board Ind*'. For studying the marginal differential impact of these board characteristics on SOE performance we include interactive terms '*Board Size * Soe*', '*Board Exe * Soe*' and '*Board Ind * Soe*', where each of these board characteristic variables are interacted with '*SOE Dummy*'. The model is given below:

Tobins Q = *f* (*Board Size*, *Board Exe, Board Ind*, *Board Size * Soe*, *Board Exe * Soe, Board Ind * Soe,* Control variables) + u

Analysis II: Government nominees on boards of private sector firms and SOEs are expected to perform differently as they are treated as outside directors in private sector firms and as insiders in SOEs. This differential treatment is expected to have differential impact on the performance of SOEs and private sector firms. We analyze this differential performance impact by including two variables. While '*Board Gnom*' is included to capture the average impact of the percentage of government nominee directors to total board size on both the private sector firms and SOE performance, the interaction term '*Board Gnom* Soe*' is included to capture the differential impact of government nominee on SOE performance as compared to their private sector counter parts. The model estimated is as below:

Tobins Q = *f* (*Board Size*, *Board Exe, Board Ind*, *Board Gnom , Board Size * Soe*, *Board Exe * Soe, Board Ind * Soe, Board Gnom* Soe* , Control variables) + u

Analysis III: Further in studying the impact of government nominee directors on SOE performance, we differentiate between government nominee executive directors from those who are government nominated non-executive directors. This differentiation is captured by introducing the variable '*Board Gnom Exe ***

Soe', which is defined as the percentage of government nominated executive directors in SOEs. The full model estimated is as below:

Tobins Q = f (*Board Size*, *Board Exe, Board Ind*, *Board Gnom* , *Board Size * Soe*, *Board Exe * Soe, Board Ind * Soe, Board Gnom* Soe* , *Board Gnom Exe * Soe* , Control variables) + u

To address the issue of influential observations, outliers were winsorized at 5 percent and 95 percent. To further check the robustness of our results we estimate all the models using MBVR performance measure. The estimation results are discussed next.

5. Results

The above discussed models are estimated for SOEs and matching private sector domestic Indian firms. Results are discussed below.

Descriptive statistics

Table (2) below describes the board structure across the two types of ownership groups. The table gives the mean, standard deviation (SD), minimum (Min), maximum (Max) and number of observations (N) for board characteristics such as board size (*Board Size*), percentage of independent directors (*Board Ind*), percentage of executive directors (*Board Exe*) and percentage of government nominee directors (*Board GNom*) for private domestic owned firms and SOEs.

Table (2) Descriptive Statistics for Board Characteristics across private domestic firms and SOEs in Large Size Indian Listed firms (2006-13)

Variables	Statistic	Private Firms	SOEs	Total
Board Size (number of directors)	Mean	9.03	13.48	9.55
	SD	3.33	4.73	3.80
	Min	3	3	3
	Max	25	30	30
	N	1606	214	1820
Board Exe (%)	Mean	21.53	41.83	23.91
	SD	16.40	15.24	17.53
	Min	0	0	0
	Max	100	100	100
	N	1606	214	1820
Board Ind (%)	Mean	48.43	30.12	46.28
	SD	18.37	18.62	19.32
	Min	0	0	0
	Max	100	66.67	100
	N	1606	214	1820
Board GNom (%)	Mean	0.44	14.58	2.10
	SD	3.44	13.97	7.35
	Min	0	0	0
	Max	66.67	71.43	71.43
	N	1606	214	1820

As seen from Table (2), while the mean board size, percentage of executive board members and percentage of government nominees in boards are higher in SOEs, the percentage of independent board members is higher in private firms. SOEs are seen to have a mean board size of 13 with a maximum board size of 30 member boards. In private sector firms the mean board size is seen to be smaller at 9 with a minimum board size of 3 and maximum of 25 members. While there are firms under both ownership groups that have either 100% of their boards as executive- non independent directors, or 100% of the board members being independent directors, SOEs seem to have, on an average higher percentage of executives at 42% and lower average percentage of independent directors at around 30% of the total board members. The private sector averages for percentage of executives and independent directors are found to be at around 22% and 48% respectively. Clause 49 of the SEBI listing agreement requires boards to consist of at least 50% independent directors when the board chairman is an executive director and at least 33% when the board chairman is non-executive director (*Guidelines on Corporate Governance for*

Central Public Sector Enterprises , 2010). Of the total number of firm year observations[17] only 37% of observations (671 firm year observations) indicated that the board was chaired by an executive chairman. Of these 671 observations, 489 belonged to private firms and 182 were under SOE ownership. Compliance to the regulation with 50% or more independent board directors was seen in 80% times under private sector firms and only about 14% times in SOEs. For boards with non-executive chairman, higher percentage of compliance was seen with 85% in private sector firms and 38% in SOEs. With regard to private sector firms in India, as pointed out by Jackling and Johl (2009), one reason for non compliance may be the lack of supply of independent directors with directorship expertise and professional qualifications. Similar reason may be true for SOEs as well.

With regard to government nominees, as seen from Table (2), on average government nominees are seen to be at higher percentage in SOEs (15%) as compared to their private sector counter parts, which show an average of less than 1% (0.4%) presence, thus indicating the presence of government nominated directors in larger proportion in SOEs. The presence of larger proportion of executive directors and government nominees along with smaller proportion of independent directors in the SOEs as compared to their private sector counterparts may be an indicator that in relationship between board structure and firm performance, ownership of the firm matters. The present study tries to analyze these ownership differential board structure impacts on firm's market-based performance indicator for the sample period 2006 to 2013.

Regression results:

All regressions are estimated after taking care of the presence of influential observations by truncating the distribution of the dependent variable at 5 percent low and 5 percent high ends of the distribution. As discussed above, estimation of the impact of board structure was done using pooled OLS method. All p values calculated are heteroscedasticity robust following Whites (1980) procedure. The results for the regression analysis are given in Table (3) below. We have also estimated similar models for performance variable MBVR, the results of which are given in Table (4) below.

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[17] Giving compliance by number of firms instead of firm year observation percentage is a better indicator but since not all firms in all years are part of our sample data, we use firm year observation percentages. This may be so due to three reasons. Firstly the firm may have been listed in some intermittent year and hence is part of our sample only from that time period. Secondly the firm may have been delisted from stock markets in some years and hence is not part of our sample from that year onwards. Also thirdly, even when the firm is listed on stock market it may not fulfill the size criteria (which are set as top 40 percentile of industry total size variation in that year) and hence is not part of our sample data in that year. Thus indicating number of firms that comply by the regulation may not be the right choice.

Table (3) Empirical results for relationship between Tobins Q and board characteristics

Variable	Analysis I Coefficient	Analysis II Coefficient	Analysis III Coefficient
Board Size	0.0321**	0.0322**	0.0321**
Board Exe	0.0025*	0.0025*	0.0025*
Board Ind	0.0018*	0.0017*	0.0017*
Board Gnom		-0.0073**	-0.0073**
Board Size * Soe	-0.0567**	-0.0646**	-0.0655**
Board Exe * Soe	-0.0167**	-0.0185**	-0.0184**
Board Ind * Soe	-0.0083*	-0.0091**	-0.0092**
Board Gnom * Soe		-0.0011	-0.0012
Board Gnom Exe * Soe			-0.0336**
Soe Dummy	1.7184**	2.0352**	2.0535**
Size	0.0076	0.0082	0.0080
Age	0.0007	0.0007	0.0007
Leverage	-0.0028	-0.0030	-0.0030
ExInt	0.0533	0.0473	0.0453
Market Shr	0.4094*	0.4161*	0.4204*
AdInt	-0.0024	-0.0024	-0.0024
DpInt	-0.0002	-0.0001	-0.0002
R&Dint	0.4219**	0.4071**	0.4087**
Year Dummy	Included	Included	Included
Industry Dummy	Included	Included	Included
Constant	Included	Included	Included
Adjusted R-Square	0.20	0.20	0.20
F	9.77	9.55	9.4
N	1638	1638	1638

Note: * denotes significance at 5 percent level; ** denotes significance at 1 percent level

Table (4) Empirical results for relationship between MBVR and board characteristics

Variable	Analysis I Coefficient	Analysis II Coefficient	Analysis III Coefficient
Board Size	0.071**	0.073**	0.0727**
Board Exe	0.002	0.002	0.0020
Board Ind	0.002	0.002	0.0017
Board Gnom		-0.020*	-0.0195*
Board Size * Soe	-0.086**	-0.068*	-0.0702*
Board Exe * Soe	-0.008	-0.003	-0.0033
Board Ind * Soe	-0.001	0.000	-0.0003
Board Gnom * Soe		0.041**	0.0407**
Board Gnom Exe * Soe			-0.0598**
Soe Dummy	1.317	0.544	0.6079
Size	0.101**	0.099**	0.0989**
Age	0.002	0.002	0.0018
Leverage	0.017	0.016	0.0165
ExInt	0.048	0.046	0.0431
Market Shr	0.424	0.386	0.3927
AdInt	0.025**	0.025**	0.0246**
DpInt	0.001	0.001	0.0005
R&Dint	0.364@	0.382@	0.3833@
Year Dummy	Included	Included	Included
Industry Dummy	Included	Included	Included
Constant	Included	Included	Included
Adjusted R-Square	0.20	0.20	0.20
F	9.17	8.95	8.79
N	1549	1549	1549

Note: * denotes significance at 5 percent level; ** denotes significance at 1 percent level; **@ denotes significance at 10% level.**

The results with respect to both Tobins Q and MBVR performance measures indicate that the board size on average has a significant (at 1% level of significance) positive impact on firm performance. The findings support prior studies such as Pearce and Zahra (1992) (also see meta- analysis by Dalton and Dalton, 2005 among others) who find large boards to have larger pool of expertise to help improve strategic decision making in firms as compared to smaller boards. Interacting board size with SOE ownership variable (*Board Size * Soe*), gives us the marginal differential impact of board size on SOE's performance. The results for this interaction variable indicate a significant (at 1% level of significance) negative relationship with SOE performance indicating that on average the board size has smaller impact

on SOE performance as compared to their private sector counterparts. In fact the net effect of board size (calculated as sum of average effect given by *Board Size* coefficient and differential effect given by coefficient of *Board Size * Soe* variable) on SOE's performance is seen to be negative particularly for Tobin's Q performance measure[18] , as compared to their private sector counterparts indicating that larger board size reduce the SOE performance. Support for our results is found in several empirical studies (like see Dalton, Daily and Johnson, 1999 for a meta-analysis) who find negative association between board size and firm performance. It is argued that when boards consist of too many members, agency problem get enhanced resulting in free-riders and boards take on a more symbolic role rather than being active monitors of firm management (Hermalin and Weisbach, 2003). Also as argued by Lipton and Lorch, (1992), Jensen (1993) among others, coordination and process problems among large groups of board members result in making larger boards inefficient as compared to smaller boards. In our study, board size is negatively related to the performance of SOEs.

With regard to percentage of executive directors on boards of large Indian listed firms, on average we find positive impact of increasing percentage of executives on Indian boards on both performance measures with consistent significant (at 1% level of significance) impact only for Tobins Q performance measure (Table 3). Further for SOEs, the interaction term (*Board Exe * Soe*) is seen to have negative impact on firm performance with significant (at 1% level of significance) impact for Tobin's Q performance measure. Increasing the number of executive directors is seen to have a lower impact on SOE performance as compared to their private sector counter parts given that the average impact is positive while the differential SOE impact is seen to be negative for both performance measures, with significant impact only for Tobins Q firm performance. In fact the net effect of increasing executives on boards for SOEs calculated as the sum of average effect of *Board Exe* and the differential effect for SOEs estimated by *Board Exe * Soe's* coefficient is also seen to become negative for both performance measures. Thus for SOEs, it is seen that increasing the number of executives in the board of directors on average lowers the firm performance as compared to their private sector counterparts. Our results are consistent with the results found in the literature by several studies (see Dalton et al., 1998). It is argued that boards with higher proportions of executive directors may be less effective in monitoring the opportunistic behaviour of managers, particularly in monitoring the CEO's activities as the executive directors need to report to the CEO as members of management ranks (Fama, 1980). Also insider dominated boards may not have

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[18] For Tobins Q the results for the net effect are consistently negative across all the model specifications, while for MBVR the net effect turns positive though it is small in magnitude (0.01) for 2 of the alternate specifications.

access to external information and resources that are enjoyed by firms outside directors thus deterring external expertise in firm's strategic decisions (e.g., Daily and Dalton, 1994b).

With regard to the relationship between the percentage of independent directors (*Board Ind*) and firm performance, the coefficient is seen to have a significant (at 5% level of significance) positive impact on firm's Tobins Q performance. The coefficient though positive is seen to have no significant (at 5% level) impact on MBVR performance variable. The impact turns negative for SOEs as indicated by the interaction term coefficient (*Board Ind * Soe*) with the net effect of the impact also becoming negative for SOEs. Thus for SOEs percentage of independent directors in boards is seen to negatively impact the firm performance, significantly so for Tobin's Q performance measure. This result may be because SOE boards are largely dominated by insiders who are either executive directors (average of 42%- see Table 2) or government nominees (15% on average- see Table 2) as compared to independent directors who on average constitute only 30% of SOE boards as compared to their private sector counter parts where the proportion of independent directors are higher at 48% while the proportion of executive directors are lower at 22% and government nominees who are considered independent directors for private sector firms are also very low at less than 1%. Higher levels of insider directors in SOEs reflects that control is largely in the hands of government bureaucrats who constitute larger part of the boards of these firms as executives or government nominees leading to poor performance of SOEs. Several in the literature have argued that SOEs are inherently inefficient because of the inbuilt inefficiency in their ownership structure where control of the firm's wealth is in the hands of government bureaucrats. (Alchian, 1977; De Alessi, 1987; Shleifer, 1994; Shleifer and Vishny, 1994; Levy, 1987; Niskanen, 1975). Our study finds support for this argument.

Results for proportion of government nominee (*Board Gnom*) indicate that on average including government nominee seem to have significant negative impact on both Tobins Q (1% level of significance) and MBVR (at 5% level of significance) performance measures. While government nominees are considered as independent directors for private firms they are considered as insiders for SOEs, hence the distinction between the ownership types is important here. Doing this with the interaction term (*Board Gnom * Soe*) we find no incremental significant impact of this variable on SOEs performance. Thus we do not find any differential impact of including government nominee directors in SOEs as compared to private sectors firms. Further analyzing this relationship we include an indicator variable for those government nominee directors in SOEs who are executives (*Board Gnom Exe *Soe*). The results indicate that there is significant negative impact of government nominees who are executive

insiders on SOEs performance. Thus including government nominees on average has significant negative impact on firm performance, with the impact being similar for both private sector firm and SOEs, while in SOEs including these directors as executives has a significantly higher negative impact. This result supports our earlier argument that SOE boards dominated by insiders, particularly government nominees impact the performance of these SOEs negatively.

With regard to control variables, while *R&D Intensity* is seen to have significant positive impact on both performance measures significance for MBVR is seen at 10% level of significance, *Market share* and *Soe Dummy* significantly impact TobinsQ performance measure and *Size* and *AdInt* are seen to have significant positively impact on MBVR performance measure.

6. Conclusion

In the empirical literature there are several studies that have analyzed the impact of board characteristics on firm performance. While most studies have focused on the private sector firms, there are no study to the best of our knowledge that has studied the relationship between board characteristics and firm performance under differential ownership structures of SOE and private owned firm in a single unified empirical framework. Our study is an attempt towards filling this gap in the literature. We find evidence supporting the argument that ownership differentials exist in the relationship between board characteristics and firm performance. Specifically the study finds, board size, percentage of executive directors and percentage of independent directors in boards of SOEs to impact their performance more negatively as compared to their private sector counter parts. Further while the percentage of government nominee directors is seen to have no differential impact on SOE performance and private sector firms, the government nominee executive directors in SOEs are seen to have significant negative impact on the firms performance as compared to their private sector counterparts.

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