Influence of Top Management Team Characteristics on Firm Performance in High Growth Environment: Examining Mediation Mechanisms Using Content Analysis of Annual Reports

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Abstract

Top Management teams (TMT) play an important role in determining the strategic actions of a firm and in turn shaping the organizational outcome and performance. Hambrick and Mason's Upper Echelon perspective provides a theoretical framework to understand the top management teams and its influence on organizational outcomes. In this paper, we study how various TMT characteristics influence Firm Growth in high growth environment. We intend to explicitly test the mechanisms through which TMT demographic characteristics like TMT age, tenure, education, functional background and heterogeneity affect firm performance. Through content analysis of annual reports, we create variables to represent risk taking, innovativeness, internal and external focus, and inclination to change. These are then used as mediators to the TMT characteristics - Firm Growth relationship. We intend to test these hypotheses on a sample of large Indian firms (S&P BSE 500), for the period 2007 to 2012.

Keywords: Top Management Team, High Growth Environment, Content Analysis of Annual Reports.

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Organizations are considered to be a reflection of the top management, and hence research on top management teams form an important part of strategic management literature. Upper Echelon perspective proposed by Hambrick and Mason (1984) is a dominant lens to study top management teams and their influence on organizational outcomes and performance. According to this perspective, top management teams due to their bounded rationality make strategic choices based on their cognition, perceptions and values (Carpenter et al., 2004). Since it is difficult to measure these directly, manager's demographic characteristics can be used as a proxy to measure them. Following this model, researchers have examined various managerial characteristics like age, tenure, level and type of education, functional background among others. The influence of these on different strategic actions like R&D investments, diversification, and internationalization are studied along with the influence on firm performance.

While most of the studies on upper echelon theory have looked at how managerial demographic characteristics correlate with different organizational outcomes, they have not empirically examined the underlying mechanisms. In this paper, we empirically test the underlying causal process through the study of mediation mechanisms. Since it is difficult to obtain these mediator variables directly through secondary database or through surveys, we use content analysis of the "Letter to Shareholders" from the annual reports.

In this paper, we hypothesize how TMT characteristics like (1) TMT Age (2) TMT Tenure (3) TMT Education (4) TMT Background and (5) TMT Heterogeneity influence firm

performance measured as Sales Growth. Apart from the direct influence, we also examine the mediation mechanism in the relationship. We hypothesize and empirically examine how Risk Taking mediates the negative influence of TMT Age on Firm Growth. Next we examine how "Innovativeness" moderates the influence of TMT Education and TMT Heterogeneity on Sales Growth. We then examine the mediating role of "Inclination to change" on TMT Tenure – Sales Growth relationship and Internal/external focus on the TMT Background – Sales Growth relationship.

The empirical analysis will be carrier on the 500 largest Indian firms listed on the Bombay Stock Exchange (BSE) from year 2007 to 2012. We obtain data on financial variables through Prowess Database. BSE's PRIME Directors database and annual reports are used to collect the Top Management Team Demographic variables. The mediating variables which are TMT cognitive variables are usually measured through individual surveys. Since it is difficult to get high response rates from TMT members, content analysis of annual reports is used as an alternative. Content Analysis process begins with the creation of a word list to represent each of the mediating constructs. Approach suggested by Short (2010) is used to create the wordlist. We then use DICTION software to perform content analysis on the "Letter to Shareholder" section of the Annual Reports, to obtain the values of the mediator variables. Panel data regression is used to test the hypotheses.

We contribute to the literature in two major ways. First, past studies on Upper Echelon theory only look at the direct effect of TMT characteristics on firm performance. We extend this research by examining the mediation mechanisms through which the performance is affected. Since directly obtaining these mediator variables are difficult, we use content analysis of annual reports to obtain them. Developments in the Computer Aided Text Analysis (CATA) software

have made content analysis of large number of documents easier, and we make use of one such tool called DICTION for our analysis.

Most of the research on Upper Echelon theory has been carried out in the context of Developed Western economies especially the US (Hambrick, 2007). We undertake our research in the context of an Emerging Economy - India. Rapid growth experienced by firms in such context has implications for TMT characteristics – firm performance relationship. We theoretically argue how this relationship is different in high growth environment compared to the stable environment and before we empirically test them.

The paper is divided as follows. In the next section, we briefly explain the Upper Echelon perspective before we describe the hypotheses. This is followed by the methodology section, where we describe the context of the study and dependent, independent and mediation variables. Finally, we describe the content analysis process. This paper is a work in progress and we intend the carry out the empirical analysis in the future.

Theory and Hypotheses

Upper Echelon Theory and Firm Growth

The study of top management team and how top management team characteristics affect different organizational strategies and firm performance has been one of the important questions in the area of strategic management. Upper Echelon theory is the dominant perspective to study the influence of top management team on firm's strategic decisions and its outcome. According to this perspective developed by Mason and Hambrick (1984), values and cognitive bases of the powerful executives in the organization are reflected in the firms' strategic decisions. Since

executive's values and cognition are difficult to measure directly, they suggest using managerial demographic characteristics as their proxies.

Several studies have empirically tested the basic Hamrick and Mason (1984) model and built upon them. Initial studies looked at how Top Management Team characteristics, especially CEO characteristics, influenced firm performance. The common variables considered were age, tenure in organization, education and functional background. Later studies looked at the influence of these characteristics on other strategic decisions like R&D investments (Barker and Mueller, 2002), internationalization (Tihanyi et al., 2000) and diversification. The basic Hambrick and Mason's model is extended by recent researchers by considering various moderators like TMT discretion and power (Hambrick, 2007) and by identifying various antecedents to TMT characteristics (Carpenter et al., 2004). Carpenter et al.(2004) provides a review of research on Upper echelon perspective and Hambrick (2007) provides an overview on current direction of this stream of research.

TMT Age

Risk aversion of older executives may result in the negative association between TMT age and firm growth. According to Child (1974) and others, older executives have lesser propensity to take risk. Hambrick and Mason (1984) have identified the following reasons for their conservative behavior. First, as executives grow older, their physical and mental strength reduces and they will be less able to grasp new ideas. Further they are at the stage of their career where financial and career stability becomes more important. In rapid growth environment, new opportunities and challenges emerge. Existing routines and organizational processes may not be

effective in such situations. Older executives who are risk averse and committed to status quo are hence less likely to lead organizations to greater growth.

Hypothesis 1: In high growth context, TMT Age is negatively associated with Firm Growth.

Hypothesis 1A: Influence of TMT Age on Firm Growth is mediated by the TMT's risk taking behavior.

TMT Tenure

Executives in the initial stages of their tenure develop perspective on their organization and its environment. As time progresses their commitment to organization's existing perspectives, processes and values increases (Hambrick and Fukutomi, 1991). According to Hambrick and Fukutomi (1991), there are three reasons why executives are not inclined to make changes to their initial commitments. First, executives have made a psychological investment in a decision and people generally do not prefer to change something on which they have made significant investment. Second, if the commitment of the executives is public, any change to this is perceived negatively on their judgement and wisdom. Finally, longer tenure by itself validates the correctness of previous decisions. As a result CEOs with longer tenure may become over confident with their past success. As argued above, in high growth context, firms face rapidly changing external environment. The existing routines and processes in the organization may not be ideal to take advantage of the new opportunities and challenges. Further long tenured executives have limited knowledge about the changing environment as they have spent most of their career inside the same organization.

Hypothesis 2: In high growth context, TMT Tenure is negatively associated with Firm Growth.

Hypothesis 2A: Influence of TMT Tenure on Firm Growth is mediated by the TMT's propensity to change.

TMT Education

Different streams of education emphasize different attitudes among students, and conversely people choose different streams based on their personalities, interest and cognitive abilities (Bantel and Jackson, 1989). Critics of MBA (and also legal education) have pointed out that such programs select risk averse students and teach them analytical techniques intended to reduce mistakes and avoid losses (Barker and Mueller, 2002) making them less innovative. In contrast, executives with advanced education in science and technology are experimental and receptive to new ideas. Empirical evidence also indicate that executives with advanced education in science and technology are more risk taking and more likely to invest in R&D (Barker and Mueller, 2002). In rapid growth environment, firms need risk taking executives with higher cognitive ability, can understand the complex environment and come up with new ideas for growth.

Hypothesis 3: In high growth context, firms with top managers with advanced science and technology education are more likely to have greater growth.

Hypothesis 3A: Influence of TMT Education on Firm Growth is mediated by the TMT's level of innovativeness.

TMT Functional Background

TMTs are composed of executives from different streams of management. Different streams or functional areas emphasize different aspects of organizational goals. "Output functions" like marketing and R&D focuses on identifying new market opportunities, with emphasis on external

markets and in turn growth. However, "Throughput functions" like finance and operations, focus on improving the efficiency of the system and are more internally focused (Hambrick and Mason, 1984). Orientation of the executives is greatly influenced by functional areas they belong to. Hence TMT dominated by executives from output functions are more likely to focus on external markets, while TMT dominated by executives from throughput functions are more likely to focus internally on efficiency. In rapidly growing environment, external focus helps firm identify new market opportunities and develop products and services to meet those opportunities.

Hypothesis 4: In high growth context, degree of Output function in TMT is positively associated with Firm growth and degree of Throughput function is negatively associated with Firm Growth.

Hypothesis 4A: Influence of degree of Throughput/output function on Firm Growth is mediated by the level of external (market)/internal orientation of the TMT.

TMT Heterogeneity

TMT Homogeneity occurs when the TMT is made of executives with similar age, education, socio-economic background and experiences. Homogeneity results in a cohesive environment where team members think alike, resulting in lesser conflicts (Janis, 1972). However in environments which are rapidly growing and problems are not well defined, TMT homogeneity may result in groupthink (Hambrick and Mason, 1984). Heterogeneous groups bring in multiple perspectives. Younger and Older people think in a different way, so are people with different functional and socio economic background. Hence heterogeneous teams enhance innovativeness and in turn helping firm's grow in rapid growth environment.

Hypothesis 5: In high growth context, TMT Heterogeneity is positively associated with Firm Growth.

Hypothesis 5A: Influence of TMT Heterogeneity on Firm Growth is mediated by the level of innovativeness of TMT.

The theoretical framework is represented in Figure 1.

Methodology

Context and Sample

We test our hypotheses on the S&P BSE 500 firms. The 500 firms listed here cover all the 20 major industries of India and represents more than 90% of the total market capitalization of BSE. The data for the 500 firms are collected from the years 2007 to 2012, when the Indian economy grew by 7.9%. This resulted in a total of 3000 firm year observations. High growth in the Indian economy facilitated rapid growth in the sales of large Indian firms. Since hypotheses look at firms in rapid growth environment, the sample of large Indian firms provide a suitable setting to test them.

Dependent Variable

Sales Growth is the dependent variable for this study. Sales Growth is calculated as [Sales (t) - Sales (t-1)]/Sales (t). Sales data is obtained from the PROWESS database. This is in line with earlier studies which have used PROWESS database to obtain firm level financial data (like Khanna and Palepu, 2000). All the independent variables are also lagged by one year compared to the dependent variable, as Sales Growth at time period t is determined by the top management conditions at the time t-1.

Independent Variable

The Top Management Characteristics are the independent variables for our study. We consider all executive directors as a part of top management. This is in line with earlier studies of Upper Echelon theory, which look at TMT as executives who serve on the board of directors (ex: Finkelstein and Hambrick, 1990). The TMT characteristics can be obtained from the PRIME Director's database (www.directorsdatabase.com). This database is created under the initiative of Bombay Stock Exchange (BSE) and contains the demographic details of all the directors of the company. Alternately, we can look at the Annual Reports of the company and manually obtain the data of the executive directors.

TMT Age is calculated as the average age of the top management team. Similarly, TMT tenure is calculated as average tenure of top management team in the organization, where tenure is calculated as the difference between current year and the year of appointment on the board. TMT education is calculated as the proportion of executives with graduate education in science and technology.

We further look at the functional background of the TMT. We create six dummy variables based on their background as done by Barker and Mueller (2002). The variables are coded based on the analysis of the profiles of the top executives. The variables represent the following categories – (1) Sales or Marketing, (2) Finance or Accounting, (3) Law, (4) General Management, (5) R&D or Technology and (6) Production or Operations. We calculate TMT – Throughput function as the proportion of top managers who have background in throughput functions and TMT – Output function as the proportion of top managers who have background in

output functions. We finally calculate TMT heterogeneity as the variability in the TMT Age, tenure etc.

Mediator Variables

Surveys are commonly used to measure cognition, values and perceptions of individuals. Since the response rates are low for such variables at the top management level, alternate ways to measure them are being looked at. Content analysis of annual reports and other organizational documents can be considered as useful alternatives to measure these variables. Content analysis of organizational documents can help us measure perceptions and beliefs of the executives, and help us understand the strategic decision making process in the organization (Short and Palmer, 2013; Zachary et al., 2011).

We use content analysis of "Letter to the Shareholders" in the annual report to measure these variables. Though letter to Shareholders are not the combined effort of all the top managers in the company, it reflects the perception of the CEO and other top managers on the external and internal environment of the organization and its implications to the organization (Short and Palmer, 2003).

First step in the content analysis is to obtain the dictionary of wordlist for the mediation variables. We use Short et al. (2010)'s stepwise process to develop content analysis measures. We first deductively obtain a list of words to represent each of the variables of interest. In the first step, we identify the theoretical definition of variable of interest. In the second step, thorough literature review is performed to identify the domain and various dimensions of the construct. In this third step, we use Rodale's synonym finder to obtain all the words that would represent the given construct. Finally, the words thus obtained are manually examined by two set

of independent raters for inclusion or exclusion from the dictionary. The words thus selected are finalized based on the inter rater reliability of the two independent raters. The deductively generated keyword list is further developed based on an inductive process, where the authors search through a subset of annual reports and inductively adds new keywords into the dictionary.

Through the above process, we obtain the wordlist for the five mediator variables of our interest – (1) Risk Taking (2) Inclination to change (3) Innovativeness (4) Internal Orientation (5) External/Market Orientation. Earlier studies have looked at creating dictionaries for some of these variables. For example, Short et al.(2010) have created dictionaries for risk taking and innovativeness. Yadav et al.(2007) have looked at internal and external orientation. Table 2 shows word lists created by the earlier studies.

Estimation

We use DICTION Software to obtain the scores for each of the mediator variables by analyzing the "Letter to Shareholders" of the 3000 Annual Reports. Mediated Regression Analysis can then be performed on the panel data to test our hypotheses.

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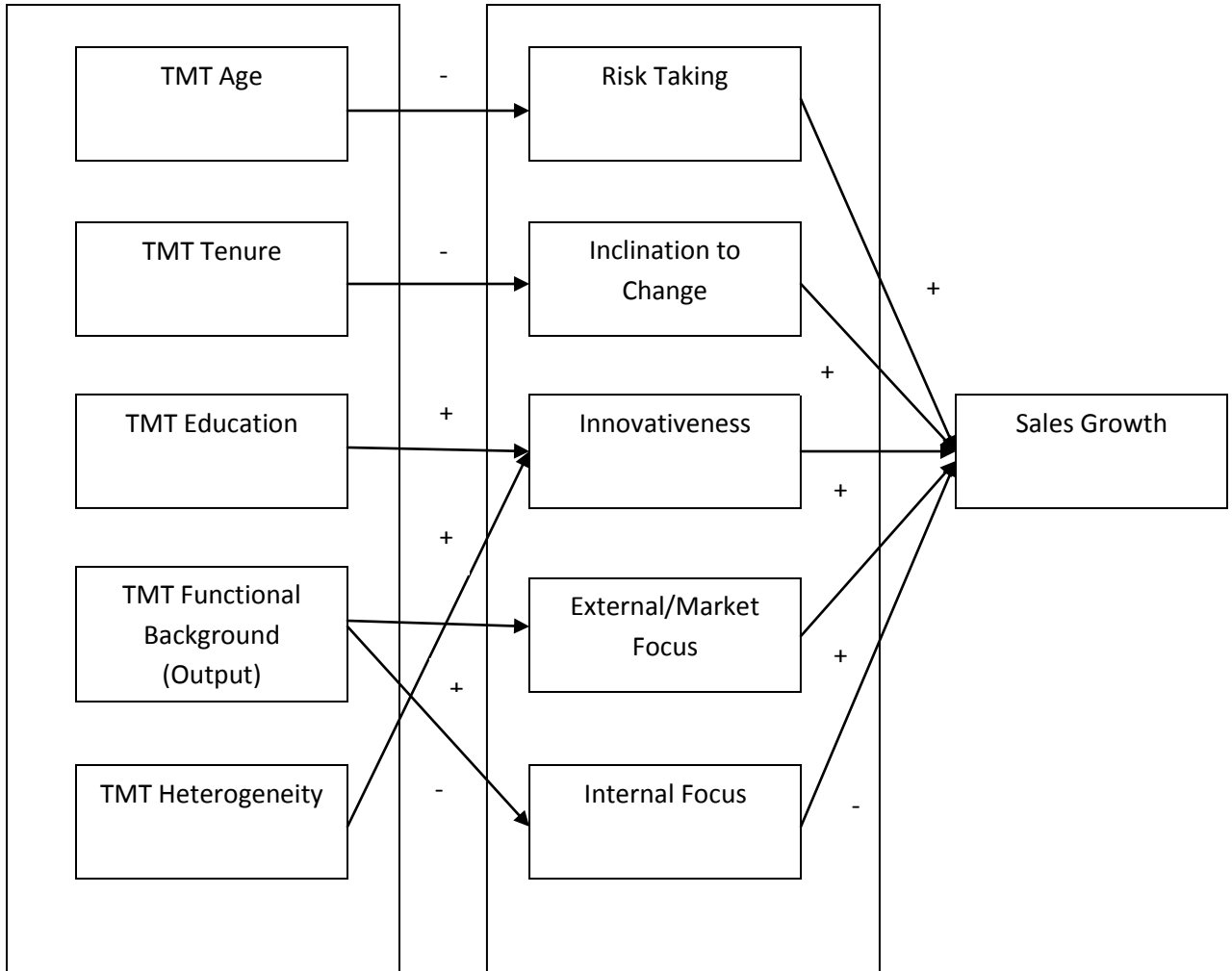**TABLE 1: SCHEMATIC REPRESENTATION OF THEORETICAL FRAMEWORK**

TMT Age	-	Risk Taking	
TMT Tenure	-	Inclination to Change	+
TMT Education	+	Innovativeness	+
TMT Functional Background (Output)	+	External/Market Focus	+
TMT Heterogeneity	-	Internal Focus	-

Sales Growth

TABLE 2: WORD LIST FOR CONSTRUCTS FROM PRIOR RESEARCH

Construct	Source	Wordlist
Risk Taking	Short et al. (2010)	Adventuresome, adventurous, audacious, bet, bold, bold-spirited, brash, brave, chance, chancy, courageous, danger, dangerous, dare, daredevil, daring, dauntless, dicey, enterprising, fearless, gamble, gutsy, headlong, incautious, intrepid, plunge, precarious, rash, reckless, risk, risky, stake, temerity, uncertain, venture, venturesome, wager
Innovativeness	Short et al. (2010)	Ad-lib, adroit, adroitness, bright-idea, change, clever, cleverness, conceive, concoct, concoction, concoctive, conjure-up, create, creation, creative, creativity, creator, discover, discoverer, discovery, dream, dream-up, envisage,envision, expert, form, formulation, frame, framer, freethinker, genesis, genius, gifted, hit-upon, imagination, imaginative, imagine, improvise, ingenious, ingenuity, initiative, initiator, innovate, innovation, inspiration, inspired, invent, invented, invention, inventive, inventiveness, inventor, make-up, mastermind, master-stroke, metamorphose, metamorphosis, neoteric, neoterism, neoterize, new, new-wrinkle, innovation, novel, novelty, original, originality, originate, origination, originative, originator, patent, radical, recast, recasting, resourceful, resourcefulness, restyle, restyling, revolutionize, seethings, think-up, trademark, vision, visionary, visualize
Internal Orientation	Yadav et al., (2007)	Organization,Organizational,Reorganization,Management,Retire,Retired,Retirement,Employee,Employees,Staff,Stakeholder,Stakeholders,Board,Manager,Managers,CEO,President,Vice-president,Vice-presidents,Director,Directors,Officer,Officers,Subsidiary,Subsidiaries,Diversification,Diversify,Diversified
External Orientation	Yadav et al., (2007)	Customer,Customers,Consumer,Consumers,Buyer,Buyers,Market,Markets,Market-place,Marketplace,Communities,Competitive,Competitiveness,Competitor,Competitors,Compete,Competition,Peer,Peers,Companies,Banks,Firms,Position,Positioning,Positioned