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Top Management Team Diversity: A Review of Theories and Methodologies

Sabina Nielsen*
Copenhagen Business School, Department of International Economics and Management, Porcelaenshaven 24a, 2000 Frederiksberg, Denmark

This paper reviews empirical research on top management team (TMT) diversity. A number of scholars have concluded that upper echelons findings, in particular in terms of the consequences of TMT heterogeneity, have been inconclusive. This review conducts an in-depth analysis of conceptual and methodological issues related to upper echelons diversity studies and offers some directions for future research. Sixty journal articles, published in ten top international journals over a 22-year period (1984–2005), were analyzed. The results suggest that upper echelons research is increasingly multidisciplinary in nature; however, in-depth inquiries into the antecedents of TMT composition and the multilevel contextual influences on the implications of TMT heterogeneity are still needed. This review finds that clarity about level of analysis, both theoretically and empirically, remains an important issue in the field and thus a multilevel approach is strongly encouraged. Moreover, the complexity of diversity as a theoretical construct needs to be acknowledged and operationalized accordingly in upper echelons studies.

Introduction

Since the seminal article of Hambrick and Mason (1984) researchers have devoted significant attention to exploring how the human side of managers, such as their backgrounds and psychological characteristics, influences the decisions they make. Early upper echelons research was dominated by the organizational demography approach (Pfeffer 1983) and primarily used quantitative large-sample methods to investigate possible links between top management team (TMT) members' demographic characteristics and various organizational outcomes. Despite the large number of studies on TMT heterogeneity, however, research has yielded inconsistent results, and the question of whether diversity in managerial backgrounds is advantageous for companies still remains open (Cannella *et al*. 2008). The findings of empirical studies on the effects of TMT demographic diversity on corporate performance range from positive (e.g. Barsade *et al*. 2000; Carpenter 2002), through non-significant (e.g. Ferrier 2001; West and Schwenk 1996) to negative (e.g. Michel and Hambrick 1992). Hence, the topic of TMT heterogeneity remains a highly controversial one and is the primary focus of this review of upper echelons research.

Scholars suggest that the hypothesized relationships between TMT heterogeneity and firm-level outcomes are not as straightforward as tested, and identified possible research gaps. Some authors discuss the exact definition of TMTs (Jackson 1992; Pettigrew 1992), while others focus on the importance of contextual factors, such as the organization and its environment (Finkelstein and Hambrick

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*Address for correspondence: Sabina Nielsen, Copenhagen Business School, Department of International Economics and Management, Porcelaenshaven 24a, 2000 Frederiksberg, Denmark. Tel: +45 38152524; Fax: +45 38152400; E-mail: sta.int@cbs.dk

1996). At the same time, most researchers agree that the hypothesized links between TMT composition and organizational choices and performance are mediated and/or moderated by team processes (Jackson 1992; Lawrence 1997; Pettigrew 1992; Priem *et al*. 1999). Consequently, various attempts have been made to address these gaps in upper echelons research empirically and to develop the upper echelons conceptual model further.

A number of excellent reviews of upper echelons studies exist in the literature (e.g. Carpenter *et al*. 2004; Finkelstein and Hambrick 1996). However, while previous reviews summarize the findings of empirical studies in the upper echelons field, little has been done in terms of reviewing what *theories* are used in conjunction with upper echelons theory. This is surprising, given that already in their 1984 article, Hambrick and Mason (1984, 203) noted the need to draw upon relevant literature in other disciplines, such as sociology and social psychology. Furthermore, as noted by Whetten (1989), most innovative research contributions result from combining theories from different disciplines.

Another unaddressed aspect is what *methodologies* are applied in upper echelons research. A research stream that originated from the organizational demography approach, based largely on secondary data sources, has significantly progressed over the past two decades. The challenging new research directions attempting to open the 'black box' of upper echelons behavior have brought along novel research approaches and methodologies. Yet, there is a lack of methodological reviews of papers published post 1994, as noted by Carpenter *et al*. (2004). This review addresses this gap by conducting an in-depth analysis of methods applied in the upper echelons diversity studies and provides recommendations for fruitful future methodological approaches. As pointed out by Carpenter *et al*. (2004), while the upper echelons stream is a flourishing one, it currently stands at important crossroads and 'debates, addressing both underlying theory and methodology, present several avenues for future advancement of executive leadership research and the upper echelon perspective' (p. 768). The aim of this paper is to evaluate critically the use of theories and methodologies applied in relation to studies on TMT diversity, in order to identify possible sources of inconsistencies in previous research and offer suggestions for future work on one of the most controversial topics in upper echelons research.

Methodology

For the purpose of a comprehensive review of contemporary research on TMTs across different disciplines, a search for articles published over a 22-year period (1984–2005) was undertaken. The choice of journals was based on a combination of the ranking of the most influential management research journals (Tahai and Meyer 1999) and the list of management, psychology and organizational behavior journals used in the Milliken and Martins (1996) review on diversity.[1] This initial choice was then extended to reflect the increasing importance of international business to the topic and included the top five leading international management journals as identified by Acedo and Cassilas (2005).[2] A keyword search was conducted on the Ebscohost database using the keywords 'upper echelons', 'top management', 'TMT' as well as 'board of directors', 'corporate boards', 'chief executive officer' and 'CEO'. From all empirical works, only articles that focused on the composition of the entire TMT, as opposed to the characteristics of the CEO or key executives were selected. Furthermore, articles which did not explicitly address issues of TMT diversity, but studied central group tendencies, such as group size, average industry or international experience etc., were excluded.

This procedure resulted in a final sample of 60 articles published in the following ten journals: *Academy of Management Journal* (*AMJ*), *Administrative Science Quarterly* (*ASQ*), *Journal of Applied Psychology* (*JAP*), *Journal of International Business Studies* (*JIBS*), *Journal of Management* (*JOM*), *Journal of Management Studies* (*JMS*), *Organization Science* (*OS*), *Management International Review* (*MIR*), *Management Science* (*MS*) and *Strategic Management Journal* (*SMJ*).

The coding of the studies was conducted in a two-step process. In the first step, selected concep-

[1] *Strategic Management Journal*, *Academy of Management Journal*, *Journal of Applied Psychology*, *Administrative Science Quarterly*, *Journal of Management*, *Organization Science*, *Personnel Psychology*, *Human Relations*, *Management Science*, *Long Range Planning*, *Psychological Bulletin*, *Research in Organizational Behavior*, *Journal of Personality and Social Psychology*, *Journal of Organizational Behavior*, *Journal of Management Studies* and *Organizational Studies*.

[2] *Journal of International Business Studies*, *Management International Review*, *Journal of World Business*, *International Business Review* and *Journal of International Management*.

tual issues such as underlying theory, unit and theoretical level of analysis were analyzed. For a more in-depth analysis of upper echelons theoretical issues, a coding scheme was developed based on Finkelstein and Hambrick's model of TMTs (1996, 120) and Carpenter *et al*.'s (2004) extended model. In the second step, several aspects of the methodologies used in the selected studies were coded, such as research method, data sources, sample size, cross-sectional vs longitudinal character of the data, statistical techniques applied and nature of the diversity measure employed.

Conceptual issues

Overview of upper echelons theory

The roots of the upper echelons perspective lie in the behavioral theory of the firm (Cyert and March 1963), which suggests that managerial choices are not always following rational motives but are to a large extent influenced by the natural limitations of managers as human beings. Behavioral factors, such as bounded rationality, multiple and conflicting goals, various aspiration levels etc., are believed to influence strategic choices made by top executives, which in turn determine firm performance. In their seminal work, Hambrick and Mason (1984) suggest that managers' observable demographic characteristics can be used as proxies for the more complex psychological dimensions of their personalities. The reasoning is based on the organizational demography approach, which criticizes the use of constructs such as attitudes, needs, values, preferences and cognitions, because such constructs are 'difficult to reliably measure and conceptually validate [and] are neither concrete nor unambiguous in their meanings and interpretation' (Pfeffer 1983, 302). Instead, demography is regarded as an important causal variable and, whereas the existence of process and other intervening variables between demographic composition and organizational outcomes is acknowledged, it is not considered necessary to explore these constructs, as they are mostly 'mental processes, which are considered difficult to access and measure reliably' (Pfeffer 1983, 351).

Owing to difficulties of gaining access to and assessing intricate psychological dimensions of top managers and their actual behavior, organizational demography has become the predominant approach in early upper echelons research (Daily *et al*. 2003; Hambrick and Mason 1984; Pettigrew 1992). Numerous empirical studies scrutinize the effects of top management demographics on organizational outcomes, such as strategy and performance. Scholars suggest that measures of distributional properties (dispersion of a group over specified categories) rather than central tendencies, such as mean, median or proportion, are considered crucial for understanding the effects of demography on organizational outcomes (Blau 1977; Pfeffer 1983).

Early empirical research on upper echelons investigated the effects of TMT heterogeneity in observable background characteristics, such as age, functional track and other career experiences, education etc., on various organizational outcomes, i.e. firm's competitive behavior (Hambrick *et al*. 1996), level of diversification (Michel and Hambrick 1992), innovativeness (Bantel and Jackson 1989), corporate strategic change (Wiersema and Bantel 1992), and ultimately performance (Michel and Hambrick 1992; Murray 1989; Norburn and Birley 1988). However, most of these studies did not reach clear confirmatory findings with regard to whether heterogeneous or homogeneous teams lead to better company performance and how diversity in TMT composition relates to firm's strategic choices (Finkelstein and Hambrick 1996; Pettigrew 1992). Hence, there is a need to apply alternative theories in combination with the upper echelons perspective in order to find the answer to the fundamental question of whether heterogeneity in TMT composition is contributing to firm strategy and performance.

Theories

Most of the reviewed studies (52 articles) used upper echelons as their main theoretical perspective. Upper echelons theory was most often combined with social psychological theories (more than 20% of the studies), most common among which are group process and effectiveness theories. Social psychology theories delve into cognitive and behavioral aspects of firm upper echelons and shed light on the role of individual psychological factors and team processes on executive decision-making. The criticism of the organizational demography approach (Lawrence 1997; Priem *et al*. 1999) and the following attempts to research the 'black box' of upper echelons theory have led to wider application of group psychology theories. The second theoretical perspective commonly used together with upper echelons is strategy process (7 studies) and the third most commonly used is firm

internationalization (5 studies). Surprisingly, agency theory was applied only in three of the selected studies. Other theories include entrepreneurship (3 studies), change (3), signaling (2), firm growth (1), resource-based view (1) and social network theories (1). Hence, a variety of theoretical perspectives have been applied together with upper echelons theory to explain the antecedents and consequences of TMT diversity. Clearly, the call by Hambrick and Mason (1984) to blend upper echelons with sociology and psychology theories has been addressed. Yet, there are a number of theories that are gaining importance in management research which may also inform future upper echelons research, such as institutional theory, human capital and social capital theories.

In terms of causality, the vast majority of studies (57 out of 60) apply TMT diversity as an independent variable according to the dominant logic of the upper echelons perspective. Only two studies regard it as a dependent variable, while one models TMT diversity as being simultaneously a dependent and an independent variable.

Levels of analysis

Both upper echelons and group diversity research involve multiple levels of theory and analysis. Based on the recent criticism of the individual approach to studying diversity, attention is increasingly paid to the different layers of context in which diversity is embedded, such as individual, group, organizational and societal contexts (Jackson *et al*. 2003). This line of argument corresponds to the increasing calls for multilevel research in management and organization sciences (Hitt *et al*. 2007; Rousseau 1985). It is important to recognize the distinct levels of theory and find an appropriate way to specify interactions among these levels (Klein and Kozlowski 2000).

Upper echelons research is inherently multilevel in nature, as it involves individuals, teams, organizations and their environments. Different level factors influence both the composition of the TMT and its effects on organizational outcomes, leading to a wide range of opportunities to apply multilevel theories and statistical analyses to the upper echelons field. Recently, however, upper echelons research has been criticized for mixing levels of theory, measurement and analysis. For instance, Cannella and Holcomb (2005) note that, while upper echelons research theoretically operates on the group level of analysis, variable operationalization has been primarily conducted on the individual level. Such inconsistency between the individual level of analysis and the group level of theory is problematic, as it creates a danger of committing the ecological fallacy (Robinson 1950). Klein *et al*. (1994) argue that a match between the level of theory, level of measurement and level of statistical analysis is essential in research including multiple levels, and illustrate how a mismatch may lead to false interpretation of findings.

Organizational-level outcomes, such as firm innovation, strategic reorientation, degree of diversification and internationalization, and organizational risk and crisis, were dependent variables in 29 (48%) of the studies. Performance is among the most commonly studied outcome variable and was defined as the ultimate outcome of top managers' actions in one-third (20) of the selected studies. Furthermore, the present review suggests that, whereas early upper echelons research focused mostly on organizational-level outcomes and corporate performance, recent research also increasingly explores team-level outcomes (17 studies). However, only three of the reviewed articles have theoretically modeled and empirically tested upper echelons outcomes at the individual level of analysis. These studies found that TMT heterogeneity has implications not only for firm-level behavior and performance, but also for the behavior of individual top executives, in particular in terms of turnover (e.g. Boone *et al*. 2004; Jackson *et al*. 1991).

In terms of theoretical level of analysis, 42 studies combined team and firm level of analysis in their theoretical development, and four focused simply on the TMT level. Only nine of the 60 studies delved into individual-level theoretical constructs, two of which combined individual with team level of analysis, and seven bridging individual with team and firm levels. Five studies looked beyond the organizational boundaries and applied industry level in combination with firm and team levels of analysis. Upper echelons theory spans individual, team and firm level as it explains the influence of individual characteristics on team decision-making and firm-level outcomes. Yet, rarely do studies consider contextual influences and cross-level interactions and apply theory and analysis at all three levels.

In addition, managerial and firm actions are constrained by the environments in which firms operate, such as industry settings and institutional context. Finkelstein and Hambrick (1996) note that studies modeling TMT composition as a moderator are not well represented. A total of 20 studies focused on industry and other environmental characteristics; 12

studies explored different aspects of firm environment as contextual factors influencing top management characteristics and eight studies explored its moderating effects on the link between TMT composition and firm-level outcomes.

The studies which modeled interaction effects between the TMT and organizational or environmental context show a rising awareness of contextual influences on the relationship between top management diversity and its effects. For instance, research suggests that, in high velocity and turbulent environments, diversity will be crucial for TMTs' ability to assess the situation and to make the best possible strategic choice. Empirical results show that, under high environmental uncertainty, heterogeneous TMTs achieve better performance, whereas less heterogeneous teams will be more successful in stable contexts (Eisenhardt and Schoonhoven 1990, Hambrick *et al*. 1996; Iaquinto and Frederickson 1997, Keck 1997; Lant *et al*. 1992). However, while the moderating role of industry context has been established in the literature, no research has investigated the embeddedness of firm upper echelons in national and institutional contexts. Whereas several studies were conducted on non-US samples, all existing upper echelons research was conducted within the boundaries of a single country, thus preventing researchers from drawing conclusions on the influence of country-level institutional and economic factors on the relationships between TMT heterogeneity and firm strategy and performance.

Five studies looked simultaneously at the TMT and CEO by recognizing the importance of considering both individual and team-level demographics and the special role of the CEO. Jackson (1992) points to the paradox that upper echelons theory, which argues the strong impact of leaders on their organization, ignores the role of the CEO as the leader of the TMT. The argument that an executive team has stronger influence on firm behavior than the CEO alone has received much empirical support (Finkelstein and Hambrick 1996). Yet, aggregating individual characteristics to the team level without paying due attention to and adequately hypothesizing the relative influence of each team member may be problematic (Cannella and Holcomb 2005). The dominant upper echelons reasoning is based on an assumption of equality of individual effects. However, the degree of influence of individual executives on firm choices depends on the power of the CEO who, as a group leader, has the 'potential to neutralize both beneficial and debilitating composition effects' (Jackson 1992, 371) as well as on the power distribution within the team itself. In a qualitative study of eight companies, Eisenhardt and Bourgeois (1988) found that politics arose from power centralization (dominant CEO combined with the desire for control by the TMT). Pitcher and Smith (2001) similarly found support for the effects of distribution of power on the degree of heterogeneity in TMTs. Power and leadership are a possible explanation for inconsistent findings of previous research on top management heterogeneity, which has neglected the influence of power and status differentiation within the team (Jackson *et al*. 2003).

Unit of analysis

The TMT was the main unit of analysis in 49 of the 60 studies. However, the definition of the TMT differs widely between studies. By introducing the term 'managerial elites', Pettigrew refers to a broader set of position holders: 'those who occupy formally defined positions of authority, those at the head of, or who could be said to be in strategic positions' (1992, 163), such as board of directors, executive committees or TMTs. Hambrick and Mason (1984, 193) refer to top management as 'the dominant coalition' or 'the powerful actors in an organization'. TMTs are also defined as 'the relatively small group of most influential executives at the apex of an organization . . . the top three to ten executives' (Finkelstein and Hambrick 1996, 8). In this review, TMTs are defined as the top executives who have a direct influence on the formulation of a firm's strategy.

When discussing the definition of firm upper echelons, it is important to note the dividing gap between TMT and board research. While both governance bodies (teams) are at the apex of the firm and influence its organization, structure, strategic decisions and future directions, research on TMT and board effects usually runs in two parallel streams. A large number of studies investigate the influence of top managers' characteristics on a number of aspects of firm strategy (for a review, see Finkelstein and Hambrick 1996). At the same time, an emerging stream in board research focuses on the board's influence on firm strategic decisions (Goodstein *et al*. 1994; Hillman *et al*. 2000; Judge and Zeithaml 1992; Rindova 1999). Finkelstein and Hambrick (1996) specifically include the board of directors in their book of strategic leadership and executive effects and define the construct of a 'Supra TMT'

composed of both top executives and board members. Yet, only four studies investigated simultaneously the effects of both and, while some find significant interactions between TMTs and boards (e.g. Boeker and Wiltbank 2005; Carpenter *et al*. 2003), others reject the concept of 'Supra-TMTs' (e.g. Jensen and Zajac 2004). Hence, a great potential exists for studies exploring the independent and interaction effects of TMT, board of directors and CEOs.

The TMT is often identified based on top executives' formal titles listed in publicly available documents or on a response provided by the firm CEO in a survey or an interview (Finkelstein and Hambrick 1996; Hambrick 1994). Jackson (1992), however, argues that, in order to investigate the impact of team demographics on strategic choices, it is necessary to consider only the persons who are actually involved in making a particular decision. This might result in a team which does not consist of all top executives, but at the same time includes managers and experts from other organizational levels. In line with this argument, in a longitudinal field study, Pitcher and Smith (2001) observed that the actual decision-making authority does not necessarily always lie with the formally defined top executive team. Similarly, Roberto (2003) argues that TMTs are composed of a stable core and dynamic periphery that changes with the decision-making situation. Pettigrew (1992) suggests that inconsistency of empirical results may well be attributed to the inconsistency in defining TMTs and argues that this issue can only be addressed by using interviews and observations.

Team processes

Several scholars have argued that the conflicting results of upper echelons diversity research are due to inherent limitations of organizational demography related to not accounting for the intermediate role of cognitive diversity and team processes (Lawrence 1997; Priem *et al*. 1999). By critically assessing its logical and methodological foundations, Lawrence concludes that organizational demography creates a 'black box' which 'moves researchers further and further away, both empirically and theoretically, from the actual mechanism underlying observed relationships' (1997, 19). A main point of criticism is the so-called 'congruence assumption'; research models based on demography include processes as concepts, which are expected to explain the relationships between demographic characteristics and organizational outcomes, however, these process constructs are not being investigated and directly measured. Thus, Lawrence (1997) argues that through the use of demographic variables the actual underlying phenomenon and the theoretical mechanisms remain unexplored.

Following this line of criticism, a number of process studies attempt to advance upper echelons research in this direction. The in-depth analysis of upper echelons specific conceptual issues shows that 27% of the studies (16 out of 60 articles) explored team processes. Different models relating team demography, processes and performance are theoretically developed and empirically tested. Empirical findings show that demography and team processes have direct effects on group and organizational performance. In addition, processes act as mediators of the relationship between team diversity and performance in seven of the reviewed studies on TMT heterogeneity. For instance, debate was discovered to mediate the interactive effects of diversity and decision comprehensiveness (Simons *et al*. 1999). Similarly, collaborative effort was identified to mediate the link between TMT diversity and decision quality, while consensus among group members on organizational goals was found to be a moderator in this relationship (Michie *et al*. 2002). Knight *et al*. (1999) furthermore found that demographic diversity affects consensus through two intervening processes: interpersonal conflict and agreement seeking. Information sharing is another important mediator variable (Bunderson and Sutcliffe 2002). By blending qualitative and quantitative methods in a case study design, O'Reilly *et al*. (1993) found that team homogeneity is associated with better team dynamics and related to more efficient firm adaptation to change. Empirical studies on TMT dynamics confirm that team processes add significant explanatory power and help shed light on the link between TMT diversity and performance.

Diversity as a construct

Diversity is most commonly defined as 'the distribution of personal attributes among interdependent members of a work unit' (Jackson *et al*. 2003). The majority of upper echelons studies use variations of this broad definition. However, as pointed recently by Harrison and Klein (2007), diversity can be defined in three different ways: diversity as separation, variety and disparity. Diversity as separation refers to differences in position or opinion among unit

members and reflects horizontal distance along a single continuum in a particular attitude or value. Diversity as variety represents differences in kind or category, primarily on information, knowledge or experience among unit members. Finally, diversity as disparity indicates differences in concentration of valued social assets or resources such as pay and status among group members.

The vast majority of upper echelons research defines diversity as variety and looks at team heterogeneity across different demographic characteristics. However, recent advances in group diversity research suggest that group faultlines are a powerful predictor of team dynamics and performance (Lau and Murninghan 1998, 2005). Rather than focusing on the dispersion of team members along a single attribute, the demographic faultlines approach considers simultaneously multiple aspects of individual members' characteristics and estimates the probability of forming sub-groups based on similarity in more than one attribute. This approach holds great promise for uncovering the simultaneous effects of multiple group composition aspects. For instance, a study by Li and Hambrick (2005) suggests that factional groups in joint venture teams (resulting from group faultlines) experience greater levels of conflict and behavioral disintegration, which in turn lead to poor performance. In a study of Dutch TMTs, Barkema and Shvyrkov (2007) found that, whereas diversity as variety had a positive influence on firm foreign expansion, demographic faultlines (diversity as separation) had a negative effect on foreign expansion moves.

In addition, while some studies on pay disparity and power differentials exist in the literature (e.g. Siegel and Hambrick 2005), these aspects of diversity as disparity have not been applied in combination with diversity as variety in existing research on TMT heterogeneity. Theoretically, it can be expected that, whereas diversity as variety may lead to divergent thinking and generation of a large number of strategic alternatives, disparity in pay and power within the TMT can constrain its capacity to act as a team and make decisions. As a result, the different types of diversity might have opposing effects on firm strategic behavior and performance. Hence, future research may greatly benefit from studying the simultaneous effects of TMT diversity as separation, variety and disparity on firm behavior and performance.

The common practice of using demographic variables as proxies for psychological dimensions of top management diversity leads to sacrificing construct validity for higher measurement reliability (Priem *et al*. 1999). Looking back to the classical Hambrick and Mason article, it is evident that the authors were already aware of this issue as they acknowledged that 'observable demographic factors simply do not provide a reliable portrayal of a person's makeup' (1984, 204). Thirteen of the studies reviewed focused on exploring the effects of cognitive diversity in TMTs, which is in stark contrast to the 49 studies (82%) focusing on demographic diversity dimensions. Only two studies explored demographic and cognitive diversity simultaneously and showed that the proxy assumption does not hold in reality. Glick *et al*. (1993) measured cognitive diversity directly and found no evidence for a link between demographic and cognitive diversity. Kilduff *et al*. (2000) found that cognitive diversity has a strong impact on team processes and performance. Demographic diversity, however, was found to have no effects on either firm performance or cognitive diversity. Miller *et al*. (1998) found strong support for a negative impact of TMT cognitive diversity on the comprehensiveness of decision-making and the extensiveness of strategic planning. A study by Barsade *et al*. (2000) similarly confirmed that, when measured directly, affective cognitive diversity in TMTs exhibits a negative impact on team processes and performance. The consistency of empirical results is a clear indication of the importance of focusing on cognitive diversity of top managers instead of relying on diversity in demographic characteristics only.

A closer look at upper echelons theory reveals the surprising fact that TMT diversity (heterogeneity) is defined as a general construct. No distinction is made between different aspects of diversity, such as nationality, sex, age, function, tenure, etc., and diversity is hypothesized to have uniform effects regardless of particular dimensions to which it is empirically applied (Finkelstein and Hambrick 1996; Hambrick and Mason 1984). Jackson (1992, 368) noted that, whereas in the context of theory a general construct of diversity might be useful, when conducting empirical research it is important to decompose the construct to the level of single attributes. Furthermore, an assumption that all diversity aspects will have similar influences on TMT choices and behavior is not grounded in theory. Group effectiveness theories differentiate between the effects of different types of diversity, and reviews of group diversity research conclude that the effects of individual diversity dimensions should be studied separately (Milliken and Martins 1996; Williams and O'Reilly 1998).

In terms of diversity dimensions, functional heterogeneity is the most studied aspect (30 studies) followed by team tenure (17 studies), age heterogeneity (16), educational background heterogeneity (14), company tenure heterogeneity (10 studies) and elite education (4 studies). Executive experiences are far less studied than executive background characteristics. Industry experience was examined in six studies, international experience was the focus of a further six studies, and five upper echelons works dealt with other aspects of executive experiences, such as prior TMT experience, shared TMT experience, prior firm experience, etc. Non-work-related observable aspects of TMT heterogeneity are clearly under-researched, with only one study exploring the effects of gender diversity, and two studies looking at diversity in executive nationalities. Yet, with the slow but steady increase in minorities represented on the TMTs of large corporations, gender and race (nationality, ethnicity) may be important diversity attributes for future research.

It is also important to note that one-third of the studies (20 articles) focused on a single diversity dimension. From the remaining 29 studies, which focused on demographic diversity and employed multiple dimensions, only one looked at the interaction effects between different TMT characteristics (Kor 2003). Two studies used multiple survey items to assess TMT cognitive diversity (Gioia and Thomas 1996; McNamara *et al*. 2002). A further two studies attempted to combine multiple demographic diversity measures into an index of TMT heterogeneity (Ferrier 2001; West and Schwenk 1996).

Methodological issues

In terms of research methods, there is still a clear dominance of quantitative studies in the upper echelons research stream. Archival research was used in 29 of the 60 studies. A further 24 studies applied a quantitative survey method as their primary methodology. Only seven studies used non-traditional research methodologies: three were based on computer simulations, and four used a case-study approach. Clearly, the applied methods in the upper echelons research field continue to be predominantly quantitative in nature; however, a significant increase in the use of survey methods can be observed over time. It is remarkable that, despite all the calls for triangulation in management research in general, only one study (Gioia and Thomas 1996) combined qualitative field work with quantitative (survey) methods.

The more detailed analysis of data sources showed that the majority of the studies (31) use large databases, such as Dun & Bradstreet or Standard & Poors. Eleven studies used annual reports and firm prospectus statements as other types of secondary data sources. Twenty-six studies used a survey questionnaire as a data source, and 12 studies conducted interviews with CEOs and/or other executives. Three studies conducted an experiment/simulation, and two included actual observation of TMT behavior in their research design. Twenty-three articles used more than one data source in their design.

In terms of statistical analysis, upper echelons researchers largely rely on conventional approaches. Ordinary least squares (OLS) regression was the most commonly used technique (51 studies). Four articles used correlation methods, and nine applied structural equation models (SEM). To compare multiple groups, two studies used *t*-tests, and another two applied ANOVA techniques. Furthermore, survival analysis was used in two of the 60 reviewed upper echelons articles. A quarter of the selected studies (15) were based on longitudinal quantitative data sets. Additionally, one qualitative study (an eight-year case study) was of a longitudinal nature. From the studies based on quantitative data sets (both cross-sectional and longitudinal), 15 studies used a lagged dependent variable to ensure the direction of causality. Panel data sets combining cross-sectional observations with time series have applied different approaches to analyzing the longitudinal data. Only two studies used fixed effects models, which is the more conservative approach to analyzing panel data, six used random effects models, and seven studies based their analysis on pooled OLS.

In terms of sampling, only two of the studies applied a random sampling approach. Most studies have limited their initial population to a specific industry or to the top 500 Fortune companies and have then attempted to collect data on all units of the specified population. The sample size of the reviewed studies varies from one to four companies for case studies and from 27 to 402 companies for studies applying quantitative methods. Thirty-seven of the quantitative studies had a sample size smaller than 100 firms, and only 11 had more than 200 firms in their final sample. This suggests that upper echelons studies are mostly based on small sample sizes, and this fact needs to be taken into consideration when discussing their findings. In terms of industries, 28 of

the studies focused on a single or few industries, whereas 29 used a cross-sectional sample spanning a number of industries. The most commonly studied industries are high-tech (7 studies), computer (4 studies), banking (4 studies), electronics (4 studies), semiconductor (3 studies), furniture (3 studies), food (2 studies) and airline (2 studies) industries. Apart from two articles studying Canadian firms and one studying Dutch companies, the rest of the investigated companies were all US based.

The average size of the TMT ranged between six and 33 executives. Similar to Carpenter *et al.*'s (2004) conclusion, it was observed that many studies do not report TMT size. At the same time, it is evident that late upper echelons research has attempted to overcome some limitations of previous studies. Fifteen studies directly identified the TMT, most often by asking the CEO in a questionnaire or an interview. The unit of analysis of these studies was indeed the team of executives who were involved in the strategic decision-making. However, only four studies asked the respondents to focus their answers on a particular decision-making situation. Three out of the four studies focused on the same decision, a technique which is often used to reduce bias in qualitative field research (Eisenhardt and Bourgeois 1988).

In terms of diversity measure, most studies apply a single item measure for each diversity dimension. Consistent with group diversity research, a Blau index (Blau 1977) is used for categorical variables such as function, education, etc., and coefficient of variation is most commonly used for continuous variables. Only two studies apply an index measure of TMT diversity considering multiple aspects of heterogeneity simultaneously. A further three studies used an individual level measure, the Euclidian distance of each team member to every other team member in the group. Clearly, Blau index and coefficient of variation are accepted as the norm in the field and seldom do authors attempt to use an alternative measure of team diversity. However, a recent study by Bunderson and Sutcliffe (2002), applying an intra-personal (individual level) diversity measure, showed that different operationalizations of diversity may lead to different empirical results and false conclusions.

Conclusions and suggestions for future research

This review article has identified three main possible sources of inconsistencies in previous research on upper echelons diversity, which future research should attempt to address. First, this review shows that there is limited theory development and empirical research on antecedents of TMT diversity. With few notable exceptions (e.g. Boeker and Wiltbank 2005; Boone *et al.* 2004), all reviewed studies focused on the effects of executive heterogeneity. However, as Pettigrew (1992) noted, there is a need to understand why TMTs look the way they do. Lawrence (1997) also pointed out that most organizational demography researchers ignore antecedent theories completely and called for more substantive theory of the antecedents of TMT composition. As noted by Finkelstein and Hambrick (1996, 108), managers select strategies based on their value and beliefs, and successors are selected based on the extent to which their characteristics and qualities match existing firm strategies. Hence, an understanding of the drivers behind TMT diversity is essential for building a comprehensive theory of top executives and their effects (Hambrick 2007).

This conclusion leads to two main suggestions for future research. On the one hand, the two-way causality of the relationship between TMT composition and firm characteristics needs to be adequately modeled. Future studies need to use longitudinal data as well as analytical techniques that allow researchers to account for possible reverse causality such as, for instance, two-stage least squares (2SLS) analysis. On the other hand, there is a need for investigation of the sources of differences between top executives in order to understand the effects of such differences. Different types of heterogeneity in TMT composition might have different drivers. For instance, the rational for increasing educational and functional background diversity might differ from the reasons for introducing diversity in gender, race and ethnicity. As a result, these types of diversity might have different consequences.

The second important issue that deserves further attention in future upper echelons research is the conceptualization of the diversity construct. As noted above, there is a clear need to distinguish between different types of diversity in terms of both theory and analysis, as not all diversity aspects can be expected to have the same consequences for team decision-making and corporate performance. Hence, future studies need to consider the appropriateness of diversity measures according to the underlying theory in order to strengthen the construct measurement and validity and ensure that

measures actually capture the aspects of TMT diversity they attempt to measure.

In addition, researchers need to consider that the effects of the various diversity dimensions may not be independent from each other. While a large number of diversity attributes have been explored in the literature, their effects have been scrutinized in an isolated manner. Recent advances in group diversity research (Jackson and Joshi 2004) considering interaction effects among diversity dimensions can help shed some new light on the controversial relationship between upper echelons diversity and team and organizational performance. It is possible that inconclusive findings of previous research on TMT diversity result from the fact that interactions between different aspects of diversity were omitted.

Furthermore, the distinction between diversity as variety, separation and disparity (Harrison and Klein 2007) needs to be applied to future upper echelons research. For instance, an exploration of how faultlines emerge in TMTs and influence team dynamics and decision-making can help to explain better the effects of heterogeneity in TMT composition. Also, pay disparity and power differentials (diversity as disparity) and their independent and interactive effects with diversity as variety can help explain contradictory findings of previous studies. Whereas the effects of diversity as variety on firm strategy and performance may be positive when disparity in the TMT is low, high disparity may cause some of the anticipated negative consequences of diversity, thereby leading to difficulties in making strategic decisions and resulting in poorer firm performance. Thus, future research needs to consider not only the differential effects of the three types of diversity, but also their possible interaction effects.

Finally, a large range of multilevel issues need to be addressed in future upper echelons studies. One of the most critical questions is the individual vs team level of analysis or how individuals come together to make team-level decisions (Cannella and Holcomb 2005). This question raises the need for further investigation of TMT processes as well as of the role of the CEO as the most powerful individual. In addition, modeling individual vs team-level effects in a multilevel research design can open a promising area for future research on the effects of TMT diversity. For instance, while team-level diversity might not have a direct effect on firm strategy and performance it may moderate the effects of individual characteristics on firm behavior.

Furthermore, in addition to industry, the country level of analysis needs to be more clearly integrated in the upper echelons framework. The fact that virtually all but one of the reviewed studies use North American samples raises significant concern as to the generalizability of these results beyond the North American context. Recent work by Crossland and Hambrick (2007) suggests that national systems may influence the CEO effects, and this logic can be extended to the TMT. Use of a two-stage stratified sampling, where a number of different countries are selected and then, within each country, equal size sub-samples of companies are chosen, can help overcome the issues of generalizability to other country contexts. Institutional theory can help inform future inquiries about the source of differences in executive effects across national contexts. In addition, multilevel methodologies can be used to analyze data with such a complex nested structure. Future research may also investigate the effects of subsidiary level TMTs within multinational corporations (MNCs), which are increasingly gaining importance in the global economy. The review shows that only two of the selected studies looked at business-unit-level management, and there is great potential for future studies in this direction. Future research may use multilevel design and methodology in order to explore the relative effects of subsidiary vs headquarters TMTs on corporate strategy and performance as well as the moderating effects of national and institutional factors.

This review also generates a number of methodological suggestions for future research on TMT heterogeneity. Despite recent calls for a shift in methodology (Pettigrew 1992; Priem *et al*. 1999), upper echelons research still seems to be dominated by traditional, quantitative research methods. It is difficult to find an upper echelons study using a different methodological approach, with only a few notable exceptions of qualitative field work (e.g. Eisenhardt and Bourgeois 1988; O'Reilly *et al*. 1993; Pitcher and Smith 2001). The fact that even novel studies delving into team processes are still predominantly based on quantitative research methods and rarely triangulate with non-quantitative data sources is remarkable. McGrath argues that 'if all of the studies of a given problem are based on the same methods, then the body of information thus gained is very much contingent on and limited by the flaws of those methods' (1984, 31).

When looking beyond the qualitative vs quantitative dichotomy, however, it must be acknowledged

that the field is evolving. While more than half of the reviewed studies are based on archival data sources, such as databases, there is a steady increase in the use of survey methods indicating that gaining access to TMTs is indeed possible. By the same token, the large number of personal interviews with TMT members and the case of actual observations of top management meetings show that upper echelons research is moving away from secondary sources closer to the reality of executive lives. Furthermore, scholars have been employing a number of innovative secondary data sources. For example, based on published histories, Ferrier (2001) coded the sequence of competitive actions in one industry. Similarly, Higgins and Gulati (2003, 2006) as well as Cohen and Dean (2005) collected data from managers' career histories. Peterson *et al*. (2003) even investigated and coded top executive's personality characteristics based on published biographies, interviews, memories, business histories and books about executives from large corporations. Clearly, the upper echelons field is progressing towards more in-depth investigations of top executives and their behavior, based on innovative data sources.

Similar to most empirical studies in the strategy field, upper echelons research is primarily based on purposive non-probability sampling, while hypothesis testing in social science is based on random sampling and probability theories. Usually, a random sample is drawn from a larger population, based on the assumption that this sample follows normal distribution and, according to probability theory, is representative of the larger population. Random sampling is the approach recommended to avoid systematic error (Hitt *et al*. 2005; Kerlinger and Lee 2000). Consequently, the results of upper echelon studies, the majority of which are based on non-probability sampling, must be interpreted and discussed with great care. Furthermore, the use of purposive sampling makes it difficult to compare and discuss empirical results across studies. A second concern relates to the representativeness of samples to the population from which they are drawn, in particular in the context of survey research design, which is increasingly used in the field. Researchers need to report and discuss thoroughly non-respondent and self-selection bias to establish acceptable levels of validity (Ireland *et al*. 2005, 127). A final concern related to sampling is the sample size that remains relatively small in the upper echelons field. Researchers need to consider carefully and discuss the trade-offs between sample size, effect size and statistical power.

Issues of measurement error and construct validity are rarely discussed in the upper echelons field, with only few notable exceptions (e.g. Carpenter and Reilly 2006; Priem *et al*. 1999). As the majority of studies in the field are based on secondary data, which are assumed to be accurate and reliable, concerns relating to construct measurement remain unaddressed. Carpenter and Reilly (2006), however, raise considerable concerns regarding measurement errors and suggest the use of Nunnally and Bernstein's (1994) approach to constructing valid measures. Structural equation modeling can be applied in future studies in order to account for the latent nature of some of the upper echelons constructs. In fact, there is a clear tendency towards increasing use of techniques based on covariance structures, such as structural equation modeling. Such techniques are particularly useful in modeling and testing multidirectional relationships in recursive models (Kline 2005). Furthermore, recent advances in structural equation modeling such as latent growth modeling hold great promise for unraveling the longitudinal dynamics of firm strategies and their TMTs.

This review further notes the lack of multilevel theory and methodology in upper echelons research. While a large number of studies suggest that executive effects are highly dependent on different layers of context (team, organizational, industry and national contexts), research has yet to benefit from the application of multilevel methodological approaches. While a few studies applied ANOVA techniques, mixed coefficient models are virtually lacking in the upper echelons research stream. There is high potential in applying these methods in the future in order to analyze appropriately multilevel relationships and cross-level interactions between individual, team, firm, industry and country levels of analysis. Contextual analysis is a development in the social sciences, which for a long time has explored the effects of different layers of social context on individual behavior. However, until the 1980s contextual modeling focused primarily on the definition of appropriate social context variables to be used in OLS regression analysis. Only with the development of statistical procedures for mixed coefficients models, such as random effects (random differences between groups) and random coefficients (random effects of variables), did multilevel analysis emerge as an analytical approach (Snijders and Bosker 1999). It has since been recognized that, in contextual modeling, the

individual and the context are two distinct sources of variability, which should be modeled as random influences. With the development of multilevel analysis techniques, new opportunities open up for researchers to scrutinize more precisely the multilevel nature of executive effects. Multilevel structural equation models can facilitate the simultaneous test of construct validity and multilevel influences in the field.

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