

Top Management Teams' demographic characteristics and their influence on strategic change

M. Carmen Díaz-Fernández · M. Rosario González-Rodríguez · Biagio Simonetti

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Abstract The purpose of this research is to analyse the relation between the Top Management Teams (TMTs)' socio demographic' characteristics and the corporate strategic change, measured as Carpenter (Strateg Manag J 23:275–284, 2002) through Finkelstein and Hambrick's index (Adm Sci Q 35:484–504, 1990): the strategic variation index and strategic deviation index in the period 2007–2009. While this aim has been studied previously in the Upper Echelon Literature, the results achieved have been considered ambiguous and no concluding by some researchers. Hence this paper admits that this complex relation rooted in this stream thought, needs to be further explored as supported by those authors. The achieved findings not only shed light on the organizational demographics' black box but also enrichment the academic literature in this respect. A sample of 157 big firms from different industrial sector and nationalities with their headquarters in Spain was determined by using both secondary and primary sources due to the legal difficulties imposed by LORTAD which prevents the collection and consult of the top managers' personal information unlike other countries. Lineal regression models were applied to test the hypotheses formulated in the study. By controlling for firm performance and the industrial sector, a higher educational level, shorter firm tenures, higher international experience and a higher professional background greatly influence on corporate strategy changes. Furthermore while the firm performance seems to influence the strategic change, the industrial sector does not contribute significantly on this managerial variable. Few researchers examine the influence of TMTs' characteristics in shaping corporative strategic changes and firm outcomes using samples different from American enterprises. This paper also contributes to the existing literature by proposing different models which explain the strategic changes, measured by different indicators, using more explanatory demographical variables than in other studies and also including control variables related performance and industrial sector to reduce the ambiguity and increase the reliability of the previous researches.

M. C. Díaz-Fernández · M. R. González-Rodríguez · B. Simonetti (✉)
University of Sannio, Benevento, Italy
e-mail: simonetti@unisannio.it

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1 Introduction

A basic premise in strategic management research is that top executives play a dominant role in formulating corporate strategy (Westphal and Fredrickson 2001; Finkelstein et al. 2009). Furthermore, based on extensive research Dutton and her colleagues (Dutton 1986; Dutton et al. 2001) argued that through strategic issues the top managers gain attention in their relevant entrepreneurial role as decision-makers, being legitimated their presence in the organization (Kirkman et al. 2004; Kauer et al. 2007).

According to the previous arguments theoretical and empirical works based on March and Simon's perspectives (1958) and (Cyert and March 1963) have examined the effects of the composition and the characteristics of the Top Management Teams (TMTs) on the choice of strategy (Boeker 1997a,b). Drawing mainly on the findings of Hambrick and Mason (1984), researchers have suggested that top managers play a crucial role in strategic change, because of "strategic-level managers formulate the organizations' interpretation" (Daft and Weick 1984, p. 285) and design strategic responses, addressing these questions into TMTs by linking their demographical characteristics to entrepreneurial magnitudes such as strategic change and firm performance (Park 2002; Athanassopoulos 2003; Carson et al. 2004; Kauer et al. 2007). In this way, traditionally, the research has analysed the links between the top managers and the organizational strategies, mainly in the context of managerial succession (Carlson 1972; Helmich and Brown 1972). Due to strategic practices are considerate as activities on continuity and change, as noted Jarzabkowski (2003), an increasing number of works analyzing the influence of demographic characteristics on strategic change (Bantel and Jackson 1989; Wiersema and Bantel 1992; Finkelstein and Hambrick 1990; Hambrick et al. 1995; Boal and Hooijberg 2000; Westphal and Fredrickson 2001; Hermann and Datta 2005; Wiersema and Bowen 2005; Kauer et al. 2007; Finkelstein et al. 2009; Tuggle et al. 2010) have appeared in the academic literature. All of this research reveals not only that the decisions leading to strategic changes come from the responsibility of the top managers (Child 1972; Bantel 1994; Hambrick 1994) but also that the characteristics of the TMTs can play an important role in the impulse of major strategic changes (Finkelstein and Hambrick 1990; Jackson 1992; Wiersema and Bantel 1992; Bantel 1993; Barker et al. 2001; Barker and Barr 2002; Guadalupe et al. 2012). These demographic characteristics play a central role as "they influence so much of the strategy chosen" (Boeker 1997a), as in the latest changes promoted in that strategy. In this context, authors remark the influence of the heterogeneity regarding the manager's age, functions and occupational characteristics on their managerial behaviour (Jackson 1991; Guzzo and Dickson 1996), on the improvement of the decision-making (Useem 1993) and on the strategic changes (Pfeffer 1983). Moreover, the diversity in the TMTs' results ensues from a wide range of strategic decisions (Eisenhardt et al. 1997).

On the base of these earlier considerations, in this research we will aim to analyze to what extent the changes in the strategic decisions of the top management are determined by the demographic characteristics of their members (Beckman and Burton 2011). In fact, an examination of the influences of the executives' patterns on their firm's strategy is an important area of research (Wiersema and Bantel 1992). This analyse will allow us to attain not only a major comprehension of the aim being examined but also shed light on the black box of organizational demography. Supported on Upper Echelon Theory, more recently, the study

and knowledge of the organizational demography related to managerial issues has become, once again, the central objective of several researchers (Carpenter et al. 2004; Lee and Park 2006; Clark and Soulsby 2007; Nishii et al. 2007; Marimuthu and Kolandaisamy 2009; Beckman and Burton 2011; Kinuu et al. 2012; Nielsen and Nielsen 2013; Hutzschenreuter and Horstkotte 2013; Lin and Cheng 2013; Li and Tan 2013) following the proposal launched by Hambrick (2007). As this researcher has recently manifested, attending to various requirements, the update on Upper Echelons Theory has been necessary (Hambrick 2007). This paper intends to take part of this new project, shedding light, as noted Finkelstein (2009), in what teams need to know, in order to TMT, strategic change, their background and managerial implications, as just claimed in this paper.

Many empirical Upper Echelon Research contributions show that top managers do matter to corporate success (Kauer et al. 2007). Furthermore, TMTs' demographic characteristics make a difference in the firm (Carpenter et al. 2004). However, it has also been acknowledged that their effects on managerial magnitudes as decision, strategy or performance are far more complex than previous researches in demographical literature had assumed. Thereby some authors as Kilduff et al. (2000), Pitcher and Smith (2001) and Carpenter et al. (2004) has find that the result achieved regarding to Upper Echelon may be ambiguous in particular circumstances (Kauer et al. 2007). According to this ambiguity and with other researchers (Priem et al. 1999; Williams and O'Reilly 1998; Boone et al. 2005; Hambrick 2007; Nielsen 2010; Lin and Cheng 2013) we consider that this complex relation rooted in Upper Echelon Theory needs to be further explored. New approaches and points of views are needed to affront the environmental complexity due to the current financial and business crisis and thereby, the transformation suffered by many companies to go on growth and survival in these business environment (Bohman and Lindfors 1998; Uhlenbruck et al. 2003; Yamak and Usdiken 2006). In addition, outsourcing has become a fundamental strategic line adopted by many firms to deal the above environmental business context (Gottfredson et al. 2005). However, many top managers have showed remained unprepared against this strategic line, thereby, a new era of capability sourcing will trigger organizational redesign, requiring a new set of managerial skills in a dynamic technological industry where probably top manager's knowledge and capabilities grew obsolete more quickly than they could learn (Henderson et al. 2006).

The article has been structured as follows: In the next section, a literature review of the theories and paradigms of the aim of the study has been analyzed: TMTs' demographic characteristics and their influence on strategy change, as a necessary background to understanding the fundamental elements behind the hypotheses presented later on. Then, some methodological aspects and the main results attained are exposed. The article ends with some conclusions, implications and recommendations regarding the suitability of the study concerning the managers' demographic characteristics as a determinant of strategic change.

2 Literature review: Top Management Teams' demographic aspects and strategic change

Over the past 20 years, the field of strategic management has become increasingly concerned with top-level managers and their effects on strategy formulation and firm performance (Waldman et al. 2004). During this period an increasing body of empirical research on top management and strategic change appears to confirm the common assumption that top executives determine new corporate strategies (Jemison 2002). Moreover, a basic tenet of research on strategic change is that new top managers, and especially managers recruited from outside the organisation, typically initiate change and determine the new strategic direction

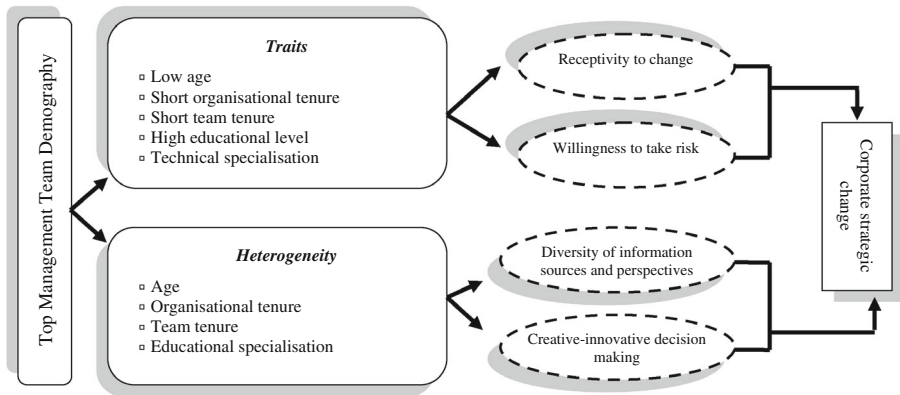
for their firm (Miles et al. 1978; Grimm and Smith 1991; Tushman and Romanelli 1985; Night et al. 1999; Papadakis and Barwise 2002; Sanders 2001; Wally and Becerra 2001; Waldman et al. 2004; Kinuu et al. 2012).

Much research in social psychology suggests that individuals tend to develop attitudes that justify their prior behaviour (Bem 1972; Fiske and Taylor 1991; Staw 1981). Research has also shown that individuals are especially likely to develop beliefs that justify their participation in an activity when their involvement is known to a wider audience (Finkelstein and Hambrick 1990; Salancik and Pfeffer 1977; Staw 1981). Since the employees routinely assign the decision-making role to the top managers according to their firms' strategy (Fombrun 1996), there should be a strong tendency for these managers to develop their own attitudes. This allows them to formulate, implement and change these strategies (Fox and Staw 1979). This tendency was dealt with by Westphal and Fredrickson. They hypothesized that "divergence between the strategies taken by the headquarter manager and the focal firm's strategy would ultimately lead to strategic change that narrows the gap" (2001). Previously, Grinyier and Spender (1979) argued that strategic reorientation is facilitated by the viewpoint of new executives whose prior experience enables them to import successful "recipes" for implementing strategic change. According to this, CEOs can learn about the effectiveness of different approaches of strategic change and implementation by observing first-hand the consequences of management decisions in other firms (Walsh 1995). Moreover, the corporate strategy of a headquarters' manager can be viewed as an important indicator of his/her attitudes and beliefs about strategy that at the same time influence the attitude and behaviour of other members of the Top Management Team and the organization as a whole. By this indirect influence the top managers become socialised into beliefs systems endorsing the corporate strategy (Salancik and Pfeffer 1977).

Studies in the Upper Echelons Literature have increasingly suggested that strategic choices are influenced by the demographic characteristics of TMTs, such as their personal background and prior experience, revealing that the top managements' experience predicts the likelihood and content of the major strategic changes (Finkelstein and Hambrick 1996). Thereby the choices of decision makers can vary widely, allowing them to insert aspects of themselves (e.g., leadership qualities) into every choice (House and Aditya 1997). This theory underline on the premise that the strategic decisions represent "weak situations" (Mischel 1977) in which available stimuli are often complex and ambiguous. According to that, it is necessary to remark that the roots of the Upper Echelons Perspective lie in the behavioral theory of the firm, which suggests that managerial choices are not always following rational motives but are large influenced by the natural limitations of managers as human beings (Nielsen 2010). Concretely, this theory emerges from Child (1972) who initially treated the top management's decisions and choices impact on firm performance. The theory has been further developed in the work of Hambrick and Mason (1984), and it has since been widely cited and expanded somewhat under the rubric of strategic leadership (Canella and Monroe 1997; Finkelstein and Hambrick 1996).

Wiersema and Bantel (1992) go further and tested that in the TMTs, the demographic characteristic of the top managers as well as their demographic heterogeneity influence the probability of strategic change in their firms. This is shown in Fig. 1.

An extension of the Upper Echelons Perspective (Hambrick and Mason 1984) would suggest that external directors cope with incomplete and ambiguous information (i.e., corporate strategy characterised by high levels of diversification or a globalised firm) and limited time for the strategies' evaluation according to their pre-existing beliefs about corporate strategy. Given that any evaluation is inherently subjective, directors' beliefs about the strategic



Wiersema and Bantel (1992: 93)

Fig. 1 Top Management Team demography and corporate strategic change

changes needed can be influenced by their prior experience (Hambel and Prahalad 1994; Jemison 1987, 2002).

3 Theoretical framework and hypotheses

Short et al. (2009) suggested that social entrepreneurship literature remains in an embryonic state in which future works could benefit from the incorporation of multivariate methods to complement the case study and statistical techniques that have dominated previous efforts. In this way, these authors recommended that the new papers embrace key themes in strategic entrepreneurship being frame using established theoretical bases relevant to strategic entrepreneurship research. According to both the argument above as the literature reviewed, five demographic variables were chosen to study the relation between the TMTs' demographic characteristics and strategic change: age, firm tenure, education, and functional and international background. Previous research has shown that these variables are indicators of attitudes about strategic change and are thus relevant to the traits of the hypotheses we will test.

3.1 Top managers' firm tenure and strategic change

Michel and Hambrick (1992) uphold that TMTs with a long organisational tenure has a great social cohesion. This diminishes the likelihood of changing its status quo. Moreover this strong tenure provides a better comprehension of the policies and the organisational procedures, along with a major reticence to changing the former ways of operating (Hambrick and Mason 1984). These statements agree with other authors such as Katz (1982), who demonstrated that the organisational tenure was associated with their top managers' increase of commitment to political and practices established by their organizations. Finkelstein and Hambrick (1990) found a positive relation between the long service of the TMT and the strategic persistence in the chemical and natural gas distribution industries in North America. Bantel and Jackson (1989) and Hambrick et al. (1993) showed that the top management with a high length of service in the company manifested a strong commitment towards the status quo and the culture and procedure of their organizations. This situation is explained by Golden

and Zajac (2001) and Staw (1976), when suggesting that individuals are compromised by a publicly-recognised pattern this leads them to regret any change.

Consequently, there might be some reasons to expect that the firm tenure systematically and negatively affects the strategic change adopted by the top managers. In the context of this study, the following hypotheses are suggested:

Hypothesis 1a A shorter tenure in the company of the top managers brings about a major likelihood of strategic change across variations in the strategic variation index.

Hypothesis 1b A shorter tenure in the company of the top managers brings about a major likelihood of strategic change across variations in the strategic deviation index.

3.2 Top managers age and strategic change

Grimm and Smith (1991) and Wiersema and Bantel (1992) believed that the top managers age was negatively associated with strategic change. Thus, Hambrick and Mason (1984) theorized that young executives were more likely to change (e.g., growth strategies). Psychological investigations conducted by Wroom and Pahl (1971) and Hitt and Tyler (1991), highlighted a similar model revealing a negative relation between the age and the risk assumed by top managers. Later, Golden and Zajac (2001) found that older top managers are more adverse to risk, showing a lower inclination towards change in their strategies.

From the following hypotheses we expect that long-tenure Top Management Teams will become increasingly resistant to changes in strategic actions.

Hypothesis 2a A lower age of the top managers supports a major likelihood of strategic change across variations in the strategic variation index.

Hypothesis 2b A lower age of the top managers supports a major likelihood of strategic change across variations in the strategic deviation index.

3.3 Top managers' education and strategic change

Schroder et al. (1967) support that high levels of education are associated with a high interest in obtaining information and developing skills to differentiate between a wide range of incentives. Dollinger (1984) relates high training levels to a major tolerance towards ambiguity and the capacity of facing complexity. Becker (1970), Kimberly and Evanisko (1981) and Rogers and Shoemaker (1971), mentioned a strong association between training and receptivity and innovation. Wiersema and Bantel (1992) tested that both the average level of education of top managers and their heterogeneity were positively associated with change in the corporate strategy. Bolo et al. (2011) revealed significant differences with respect to both managers' type of education and experience regarding to the firm strategic behaviour. Hence Pine (2003) argued that the members of TMTs who had a positive attitude towards learning, tended to both perceive more information and to be more open to new and creative alternatives. Thereby these top managers show themselves more flexible and tolerant against the rest member of TMTs being good enough to achieve consensus and speed for making strategic decisions in the highly competitive firm environment as the current one.

In accordance with the previous assumptions, we expect that a high education of top managers will provide a variety of changes in strategic firms supported by the following hypotheses:

Hypothesis 3a A major education of the top managers increases the likelihood of strategic change across variations in the strategic variation index.

Hypothesis 3b A major education of the top managers increases the likelihood of strategic change across variations in the strategic deviation index.

3.4 Top managers' functional background and strategic change

Child (1972) recognised that top managers play a critical role in the choice of the company's strategy. Perrow (1970) upheld that the functional experience of these top managers mainly determines both the strategies and organisational decisions of the company. Particularly, French and Raven (1959) and Boeker (1997a,b) manifested that the experience developed by every top manager in another, previous functional area contributes to expanding their work in the firm. They play a fundamental role not only by choosing the strategies (Finkelstein 1992) but also by implementing and managing them (Brass 1984), simply due to the fact that the individual recovers a certain function in the same function as the previous one. Moreover, Hambrick and Mason (1984), following Miles and Snow (1984), found that the functional experience of top managers in areas related to external areas of the company (Research and Development, Marketing and Sales) stimulated the beginning of certain strategic changes in relation to the launching of new products in the market.

Hence, the following hypotheses were formulated:

Hypothesis 4a A major functional experience of the top managers increases the likelihood of strategic change across strategic variations index.

Hypothesis 4b A major functional experience of the top managers increases the likelihood of strategic change across strategic deviation index.

3.5 Top managers' international background and strategic change

Perlmutter (1969) suggested that international firms evolve through stages increasing their international presence. As firms increase their international experience, the top managers gain a geocentric perspective - an approach that seeks to integrate diverse areas through a global decision-making process. In the different stages of international expansion, Top Management Teams adopt different strategies. Sambharya (1996) found that international experience among top managers might be an important determinant of international involvement. More recently, Tihanyi et al. (2000) try to test that there will be a positive association between the average level of international experience in the Top Management Team and the degree of the firm's international diversification. All actions are closely related to strategic changes. In this line we aim to test the hypotheses:

Hypothesis 5a A high international experience of the top managers supports a major likelihood of strategic change across variations in the strategic variation index.

Hypothesis 5b A high international experience of the top managers supports a major likelihood of strategic change across variations in the strategic deviation index.

Besides the five demographical variables described above, two control variables have been included to guarantee the reliability of the analysis.

3.5.1 Firm performance

Tushman and Romanelli (1985) pointed out that low organisational performance occurs when a firm's strategy fails to achieve an appropriate alignment with its environment. Thus, poor

performance is often the driver of changes in firm strategy (Hambrick and Schechter 1983). These are frequently caused by those managers who feel more vulnerable to unfriendly takeovers, internal upheavals, and losing their jobs (James and Soref 1981). They show reluctance towards changes in firm strategy to improve performance. In this sense, Wiersema and Bantel (1992) thus expected a relationship between poor organisational performance and corporate strategic change.

3.5.2 Industrial sector

Researchers in the strategic literature have noted that environment is mostly responsible for the changes in the strategies adopted by firms (i.e., Andrews 1971; Child 1972). A firm's TMT identifies environmental opportunities and problems, interprets relevant information, considers organisational capabilities and constraints, and formulates and implements strategic changes (Mintzberg 1979). We believe that the characteristics of the industrial sector provide incentives for firms to pursue changes in their own lines of strategies. Changes in strategy may be a defensive movement adopted by managers to mitigate undesirable characteristics in an industrial sector or a firm's dominant industrial environment. In response to poor growth and profit opportunities in their core businesses, firms are likely to pursue opportunities elsewhere (Gort 1962; Ansoff 1965; Rumelt 1974; Bass et al. 1978; Levina and Su 2008; Tsai et al. 2008; Agarwal and Helfat 2009).

4 Methodology

4.1 Sample and procedure

A random sample of 157 firms was selected in the period 2007–2009 as listed in a specialised magazine in our country: *New Firm*, being this period the most recent one to obtain the complete information needed to carry out our analysis.

The sample size is justified by: Firstly, the study needs the demographic variables of the all the members of the Top Management Teams. This information is difficult to obtain since the teams are characterized by their high rotation. Secondly, in our country not only is there not a database on the demographic characteristic but also the LORTAD law¹ makes it difficult to obtain this information.

90 % of the information about managerial demography was obtained from the employment of secondary information sources, only the remaining 10 % being primary information due to the limitations commented previously.

The information related to strategic change was obtained using two sources in the period 2007–2009: the System of Analysis of Iberian Balances (SABI)² and the National Commission of the Stock Market (CNMV).³

¹ LORTAD, Organic Spanish Law, specifically, Ley Orgánica 5/1992, October 29th, on the treatment of the personal data.

² SABI is a database created by the company Informa that has collected annual accounts from the main Spanish and Portuguese companies since 1990. It is an interesting tool that helps with business analysis, comparisons between companies or company groups, rankings, concentration and segmentation analysis, and sectorial studies.

³ CNMV is the Spanish government agency responsible for the financial regulation of these securities markets in Spain. It is an independent agency that falls under the Ministry of Economy and Finance of Spain.

4.2 Variable measurement and data analysis

4.2.1 *Dependent variable*

Strategic change was measured following [Carpenter \(2002\)](#) through Finkelstein and Hambrick's index (1990): the Strategic variation index and Strategic deviation index for 2007–2009.

The variation strategic index represents the degree to which the strategy of the company changes over time ([Carpenter 2000](#)) and was calculated for every company and year during the study, as the standard summation of the diversions of the indicators of [Finkelstein and Hambrick \(1990\)](#): (1) renovation of the immobilised material = immobilised material – amortisation accumulated of the immobilised material/immobilised material; (2) inventor level = total assets/sales; (3) indebtedness = debt/FP ([Carpenter 2000](#)).

The deviation strategic index, as noted [Carpenter \(2000\)](#), captures the degree to which the managerial strategy turns aside from the central trend of its sector of reference, and according to this author, was calculated through the following formula: $\sum /$ strategic indicators of the company of [Finkelstein and Hambrick \(1990\)](#)—industry level factors/(2007–2009); the equal Industry level being factors of the average weight of the sales of the companies with regard to the companies that, within their industry (sector), develop their activity during this period of study.

With the use of these two indicators of strategic change we have pursued an increase of the reliability of the measurement of this variable, and the consistency of the results attained in our study at the moment of verifying the different hypotheses tested. Moreover, we have aimed to support a more complete vision of the effects of the managerial demography on strategic change. In this sense, we believe that our study of the influence of the managerial demography on strategic change across two dimensions of this strategic variable is pioneer research in our country based on the Upper Echelon Theory.

4.2.2 *Independent variables*

Demographic characteristics For each TMT as mentioned above five demographic characteristics were coded: age, education, international experience, functional experience and firm tenure.

Educational (level and background) and functional background are categorical variables, and were categorised following [Wiersema and Bantel \(1992\)](#). International work experience was calculated for TMTs, following [Carpenter and Fredrickson \(2001\)](#) as the percentage of team members' total years of experience acquired in their work experience. Age was calculated via the biographical information of the top managers and, finally, firm tenure was worked out using the respective tenure of the top managers in the firms.

4.2.3 *Control variables*

Firm performance was measured, following [Denis and Denis \(1995\)](#), as the average return on assets (ROA) and return on sales (ROS) for the three year period from 2007 to 2009. We used data from the CNMV and SABI. Performance during this time period was assumed to have provided the drive for changes in corporate strategy during a later period. Average firm performance, rather than performance relative to the industry, was used due to a relative performance measure allows for intra-industry comparisons ([Wiersema and Bird 1992](#)). However, for highly diversified firms with substantial operating revenues from a number of

Table 1 Model I dependent variable strategic variation index (control variable)

	R ²	Adjust. R ²	F stat.	Sig. F
Summary of the model ^{a,b}				
Model I	0.645	0.628	38.684	0.000
	Beta	Stand. error	t	Sig.
Coefficients ^{a,b}				
Model I				
Constant	2.440	0.755	3.230	0.002
Industrial sector	-0.127	0.069	-1.841	0.068
ROA	0.125	0.020	6.250	0.000
ROS	0.104	0.007	14.857	0.000

^a Predictors: (constant), industrial sector, ROA, ROS
^b Dependent variable: strategic variation index 2007–2009

Table 2 Model II dependent variable strategic deviation index (control variable)

	R ²	Adjust. R ²	F stat.	Sig. F
Summary of the model ^{a,b}				
Model I	0.174	0.135	4.476	0.000
	Beta	Stand. error	t	Sig.
Coefficients ^{a,b}				
Model I				
Constant	7.09	1.079	6.626	0.000
Industrial sector	-47.318	8.848	-5.348	0.000
ROA	0.535	0.040	13.375	0.000
ROS	0.144	0.047	3.064	0.000

^a Predictors: (constant), industrial sector, ROA, ROS
^b Dependent variable: strategic deviation index 2007–2009

industries, this type of comparison is meaningless. A comparison of a firm's performance with that of a random sample of similarly diversified firms is the most appropriate measure.

Industrial sector was ascertained for the four-digit SIC industry representing each firm's dominant line of business carried out by the National Enterprise Activities Commission (CNAE). The industrial sector variable was re-codified by a dummy variable, where value 1 represents those sectors more reluctant to the strategic changes and the value zero otherwise.

5 Results and discussions

The hypotheses were tested by regressing strategic change, measured by the dimension of strategic change following Carpenter (2002), on control variables and the demographic measures. We tested separate regression equations, in line with studies of demographic literature, for different models (Tables 1, 2, 3, 4). This approach allows the comparison of the relative effects on the explained variance of each of the three sets of variables.

In Model 1 and Model 2, the strategic change measured by the strategic variation and deviation index has been regressed on the predictor variables (firm performance and industrial sector). The results indicated the significant effect of the performance variable on strategic change ($p < .001$), however, in the control variable industrial sector, there is only a significant

Table 3 Model III dependent variable strategic variation index (full model)

	R ²	Adjust. R ²	F stat.	Sig. F
Summary of the model ^{a,b}				
Model III	0.681	0.642	17.442	0.000
	Beta	Stand. error	t	Sig.
Coefficients ^{a,b}				
Model III				
Constant	-5.141	3.707	-1.387	0.168
Industrial sector	-0.087	0.067	-1.299	0.196
ROA	0.107	0.007	15.286	0.000
ROS	0.067	0.022	3.045	0.003
TMT age	0.135	0.068	1.985	0.049
TMT education level	0.970	0.355	2.647	0.009
TMT firm tenure	-0.178	0.087	-2.046	0.043
TMT international experience	0.613	0.283	2.167	0.032
TMT functional background	3.791	1.499	2.529	0.012

^a Predictors: (constant), industrial sector, ROA, ROS, TMT age, TMT education level, TMT firm tenure, TMT international experience, TMT functional background
^b Dependent variable: strategic variation index 2007–2009

Table 4 Model IV dependent variable strategic deviation index (full model)

	R ²	Adjust. R ²	F stat.	Sig. F
Summary of the model ^{a,b}				
Model IV	0.231	0.137	5.964	0.0034
	Beta	Stand. error	t	Sig.
Coefficients ^{a,b}				
Model IV				
Constant	1.468	2.182	0.673	0.504
Industrial sector	-0.455	0.0961	-4.732	0.000
ROA	0.109	0.009	12.111	0.003
ROS	0.069	0.032	2.156	0.001
TMT age	5.103	9.718	0.525	0.600
TMT education level	0.899	0.1989	4.5212	0.000
TMT firm tenure	-0.672	1.431	-0.469	0.639
TMT international experience	0.939	0.973	-0.965	0.336
TMT functional background	-3.715	2.159	-1.72	0.088

^a Predictors: (constant), industrial sector, ROA, ROS, TMT age, TMT education level, TMT firm tenure, TMT international experience, TMT functional background
^b Dependent variable: strategic variation index 2007–2009

effect on one of the dimensions of strategic change used: the strategic deviation index ($p < .005$). This effect is a consequence of the definition of this index.

Regressing strategic change on the control and the demographic characteristic in Model 3 and Model 4 (Full Models) supported the majority of our hypotheses about managerial demographic characteristic influencing firm strategic change. If we consider the dimension

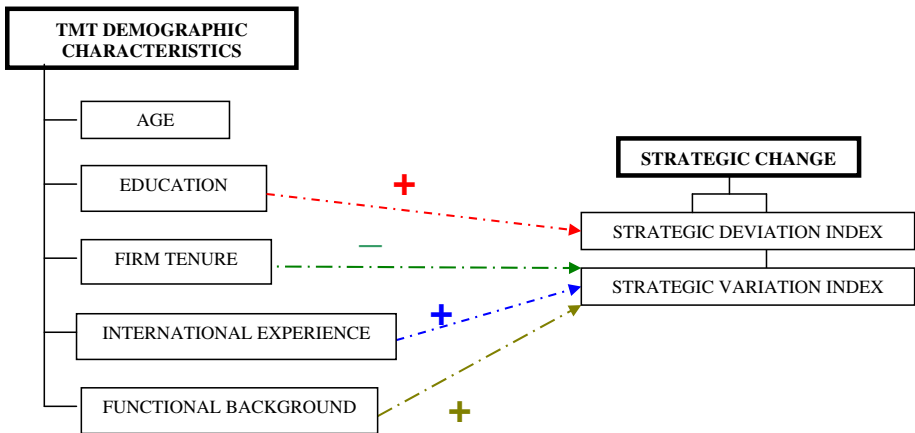


Fig. 2 TMTs demographic effects on strategic change

of strategic change, the strategic variation index, in Model 3, the results of the regression analysed show that firms with Top Management Teams characterised by a more functional background, more international experience and with relatively short firm tenure will exhibit greater strategic change ($p < .005$). Considering the dimension of strategic change, the strategic deviation index, Model 4, the results of the regression analysed provide support for the hypotheses that firms with Top Management Teams with high education levels are significantly associated with strategic change ($p < .001$).

The results of this study prove that the firms most likely to undergo strategic change had Top Management Teams characterised by relatively short firm tenure, a high educational level, high international experience and a high functional background (Fig. 2).

The research makes some important contributions to both strategic management and demographic literature studies. Furthermore, the findings are relevant in our country since this research has been scantily studied empirically considering the totality of members of the TMT.

The demographic variables of the top managers influence the strategic changes differently regarding the dimension used as an estimated variable. The dimension strategic variation index, defined according to the strategy change over time, is influenced by those demographic characteristics related to their experience, attained by their age and their professional background coming from the firm tenure, international experience and the functional background. On the contrary, the strategic deviation index, a more static variable than the previous dimension, is influenced only by the demographic variable education level, more related to the necessities of the reference industrial sector.

6 Conclusions and future research

This study aims to contribute to the Upper Echelon Literature and strategic literature in our country by going beyond previous work that studied it using a sample of complete TMTs.

Specifically, it places our managerial research in the discussion of the black box of managerial demography and suggests that the demographic characteristics of top managers in TMTs play a significant role in the degree to which large firms adopt their strategies to predict organisational outcomes in environmental uncertainty. Moreover, we aimed to demonstrate

how the demographic characteristics of the top managers in large firms influence the strategic change which their firms adopt.

Upholding our expectations, the results indicated that a top team's characteristics were related to the strategic change adopted in the firm. This relationship tested the hypotheses suggested about Upper Echelons and strategic literature. Also the effects of managerial demographics on strategic change are different if we consider different dimensions of this strategic magnitude. Moreover, these effects are likely occurring to contemplate the dimension "strategic variation" (time) rather than considering the dimension "strategic deviation" (sector) in the strategic change. These findings emphasise the limits when analysing the impact of the demographic variable on strategic changes. In fact, depending on how the predicted variable is defined, different predictor variables can be found as significant. They also suggest that demographics and strategic studies require different, more empirical analysis in depth involving different dimensions of the strategic change, predictors and wide samples.

The present research provides encouragement for those academics interested in pursuing the Upper Echelons Perspective of Hambrick and Mason (1984). We consider that the limits of our study can be opportunities for other researchers to get to know both managerial demography and its effect on the strategic decision-making as well as on performance-related outcomes in firms.

Under the new resurgent of the demographic stream thought, we believe the necessity to turn back the Upper Echelons Theory as Hambrick (2007) also pointed out. Nerveless, we assume it is more appropriated to support the findings by more statistical and reliability analysis, before concluding that top manager's characteristics are consequences rather than causes. On the other hand, as Nielsen (2010) argued we believe that other important issue that deserves further attention in future Upper Echelons Researches should be related to the diversity dimension of the demographical characteristics. Our research has been based on this new theoretical background approaching the first interesting contributions related to the influence of the TMT demographical characteristics on strategic change and firm performance. There is a clear need to distinguish between different types of diversity in terms of theory and analysis. However the achievement of reliable goals is a complicated task because not all diversity aspects can be expected to have the same consequences for team decision-making and corporate performance (Nielsen 2010).

Finally, this paper stands out the following relevant aspects. First, top executives really matter as much to firm outcomes as the theory seems, making decisions and engage in behaviors that affect both the progress (Sanders 2001) and the survival of the firm they lead, however they are and act as imperfect human beings (Kinuu et al. 2012). Second, one important part of the achievement of the entrepreneurial objectives is determined by a fundamental firm human resource, the top managers. According to that Upper Echelons Researches indicates how their demographical characteristics can influence in vital organizational magnitudes as management decision, strategy, strategic change, innovation, internationalization or performance (Night et al. 1999; Marimuthu and Kolandaisamy 2009; Nielsen and Nielsen 2013; Hutzschenreuter and Horstkotte 2013; Lin and Cheng 2013; Li and Tan 2013). Third, demographical literature continues alive over twenty years, and involves in a big controversy which seems to be increased after Hambrick (2007) manifested that the demographic characteristics are consequences and not cause as supported and tend to be demonstrated by the academy literature all this time. Fourth, Individual characteristics of top managers such as age, gender and experience determine the strategic lines and outcomes firm, according Upper Echelon, but hardly no literature examines executive characteristics and compensation in tandem, or their interactive effects in shaping company outcomes (Hambrick 2007). Fourth, to advance an understanding of the Upper Echelons Theory is necessary to sort out reverse causality

and endogeneity (Kinuu et al. 2012). Fifth, Leonard et al. (2005) manifested that not only the hierarchical structure established among the member of TMTs constitutes power, but also other sources and forms of leadership of each top managers individually may exert a stronger influence on the strategy and outcomes of each other TMTs' members and thereby on the firm strategy and their global performance. According to this premise our next goals are as follows: Firstly, to explore the influence on the Top Management Team of each top manager to shed light to the understanding of demography literature's black box; Secondly, to analyse top managers composition as proxy of firm performance taking account, as noted Franceschini and Turina (2013), that due to both external and internal changes may influences on the enterprise as well as entrepreneur's modus operandi, performance measurement systems need to be updated being thereby required a continuous quality improvement of firm performance.

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