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Explorando los Antecedentes del Rendimiento Empresarial en un contexto industrial Latino-Americano y Europeo diverso

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Abstract

Purpose – The purpose of this paper is to determine the top management team (TMT) intangible assets (demographical and managerial experience) diversity which influences firm performance in a diverse industrial context.

Design/methodology/approach – The paper analyses 159 whole TMTs from Latin American and European enterprises. The study focuses on three indicators (sales, return on assets and return on sales) as proxies of firm performance. The hypotheses formulated were tested using panel data and applying a random-effects model.

Findings – The paper reveals a large degree of volatility in the findings depending on the type of firm performance indicator. This provides insights regarding the controversy surrounding the black box Upper Echelon Theory and for entrepreneurial purposes concerning the relationship between TMT composition and the achievement of a high level performance.

Research limitations/implications – This study could be extended by analysing other important variables, such as top mangers' physiological traits and cultural differences within the TMTs. The analysis could also be applied to a wider geographical area.

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Practical implications – This paper may help enterprises to reach a better understanding of their TMT's internal complex diversity by providing appropriate insights for a better decision-making process required to achieve an accurate firm outcome.
Originality/value – The paper is an extension on prior studies not only by focusing on a different geographical area different from the traditional USA context but also applying a longitudinal study scarcely applied in the demographic literature. In addition, attributes for all the TMT's members (not only CEOs), three different proxies of performance and a highly diverse industry context from Latin American and European companies have been considered.

Keywords Top management team, Demographics, Firm performance, Upper Echelon Theory
Paper type Research paper

Resumen

Propósito – El propósito de este artículo es determinar la diversidad de los activos intangibles del equipo de alta dirección (características demográficas y experiencia directiva) que influyen en el rendimiento empresarial en un contexto industrial diverso.
Diseño/metodología/enfoque – El artículo analiza 159 equipos de alta dirección completos procedentes de empresas Latino-Americanas y Europeas. El estudio se centra en tres indicadores como proxies del rendimiento empresarial (ventas, rotación de los activos y la rotación de las ventas). Las hipótesis fueron testadas utilizando datos de panel y aplicando un modelo de efectos aleatorios.
Resultados – El artículo pone de manifiesto una gran volatilidad en los resultados dependiendo del tipo de indicador de rendimiento utilizado. Este resultado proporciona luz a la controversia existente en torno a la "caja negra" de la Upper Echelon Theory y para propósitos empresariales concernientes a la relación entre la composición del equipo de alta dirección y el logro de altos niveles de rendimiento.
Limitaciones de la Investigación/implicaciones – Este estudio podría ser ampliado a partir del análisis de otras variables importantes como los rasgos psicológicos de los altos directivos y las diferencias culturales existentes dentro del equipo de alta dirección. El análisis puede ser también aplicado a una más amplia área geográfica.
Implicaciones prácticas – Este artículo puede ayudar a las empresas a alcanzar una mayor comprensión de la de la complejidad de la diversidad interna de su equipo de alta dirección proporcionando necesario para adoptar el mejor proceso de toma de decisiones para alcanzar y asegurar los objetivos empresariales.
Originalidad/Valor – El artículo es una extensión de estudios anteriores que no solo se centran en un área geográfica diferente al contexto tradicional norteamericano sino que también es una aplicación de una estudio longitudinal escasamente aplicado en la literatura demográfica. Además, se han considerado atributos de la totalidad de los miembros del equipo de alta dirección (no solo aquellos referentes a los CEOs), tres diferentes proxies del rendimiento y todo ello aplicado en un contexto industrial altamente diverso integrado por empresas Latino-Americanas y Europeas.

Palabras clave Equipos de alta dirección, Características demográficas, Rendimiento empresarial, Upper Echelon Theory
Tipo de trabajo Trabajo de investigación

1. Introduction

Managers' roles are expanding beyond managing individuals to managing groups with the proliferation of teams in organisations (Bakar and Sheer, 2013). Associated with this expansion, the effectiveness of top management teams (TMTs) and their impact on firm performance are a central focus in much research within a strategic management framework (Marimuthu and Kolandaisamy, 2009a, b; Farias, 2014). Penrose (1959) argues that top managers are an important entrepreneurial resource for organisations, and one that has an impact on their performance. Similarly, Hambrick and Mason (1984), when applying their Upper Echelon Theory, argue that a TMT's demographic characteristics (i.e. age, education, tenure) are good proxies for underlying

traits and cognitive processes of top executives (Srivastava and Lee, 2008). Hambrick and Mason (1984) propose that an organisation's performance is a consequence of these TMTs' demographic characteristics. Upper Echelon Theory focuses on this premise but this theory is controversial within the scientific community, leading to the well-known phenomenon called the organisational demography black box.

Two research strands appear in the literature relating to the Upper Echelon Theory. The first group defends the level of demographic characteristics as antecedents of the highest rank of company performance (i.e. Hutzschenreuter and Horstkotte, 2013; Lin and Cheng, 2013a, b; Li and Tan, 2013; Lin and Kuo, 2007), while the latter supports diversity (i.e. Liang *et al.*, 2007; Marimuthu and Kolandaisamy, 2009a, b; Pitcher and Smith, 2001; Roberson and Park, 2007; van Dijk *et al.*, 2012) as an explanatory factor of that performance. However, the findings seem to be contradictory within these fields of research. Hambrick (2007) moves the debate and controversy surrounding it by proposing a change of direction in terms of the influence of the relationship between TMTs' demographical characteristics and firm performance. He suggests that the explanatory variables can in fact be the predictor variables.

As a consequence, not only does this mean that the controversy around Upper Echelon Theory is increasing, but that firms' organisational demography black boxes do not appear to offer a solid explanation of performance. In fact, the Upper Echelon Theory postulates have continued to attract researchers and entrepreneurs for more than 30 years. As Srivastava and Lee (2008) argue, now is a good time to take stock of the performance conclusions developed from the research based on TMT demographics. Furthermore, new studies are necessary to delve more deeply into the black box applying other models, statistical methods and techniques that account for the differences both within the industrial environment and the types of TMTs. Thus, this paper analyses the link between TMT demographics and firm performance, consistent with managerial discretion ideas and organisational demography related to the Upper Echelon Theory (Auden *et al.*, 2006; Allen *et al.*, 2008; Carson *et al.*, 2004; Gigliotti, 2013; Kakabadse and Kakabadse, 2006; Roberson and Park, 2007; van Dijk *et al.*, 2012).

This study considers the joint impacts of the level and diversity of demographic managerial characteristics on firm performance measured by diverse indicators that are different from the common financial indicators identified in the literature. Moreover, this research is one of the first initiatives that explore the managerial demographics of TMT in large companies and their influences on firm performance within a Latin American and European diverse industrial context different to the usual US one. This research may help top managers to identify important factors and issues to be considered to increase company performance and hence the firm's growth. This understanding can be useful not only for the companies included in the research analysis but also for other similar enterprises from other national industrial contexts.

The findings of this research can thus inform future studies by providing empirical evidence concerning company methods to improve performance and by adding new knowledge with regards to the black box demographic debate with respect to the relationship between TMT demographic characteristics and performance.

To help address the aforementioned issues, a model and a number of hypotheses are outlined. Second, the methodological considerations are discussed. Third, the empirical findings that compare the TMT level and the diversity composition as a predictor of firm performance are outlined and finally the paper concludes by highlighting the key findings of the research, the study's limitations and future research paths as well as practical contributions.

2. Theoretical background and hypotheses

The increasing importance of organisational teams has resulted in research paying significant attention to those factors that determine team performance (MacBryde and Mendibil, 2003) with team composition being especially examined (Cohen and Bailey, 1997; Guzzo and Dickson, 1996; Perryman *et al.*, 2010; Stewart, 2006). Analysing team composition is complex because of the interdependent nature of a team's tasks (De la Torre-Ruiz *et al.*, 2011) and the extent to which team members cooperate and work interactively to complete tasks (Stewart and Barrick, 2000). However, in addition to this complexity, it is difficult to test the extent to which this structure influences entrepreneurial variables, including interest, controversy and uncertainty (Jehn and Bezrukova, 2010). Accordingly, Hambrick and Mason's (1984) Upper Echelon Theory has resulted in a number of studies which have focused on TMT members during more than two decades (Hambrick, 2007; Crossland and Hambrick, 2011), suggesting that the top managers' demographical traits act as proxies of their perceptions and cognitive base, which are expected to influence their strategic choice and consequently organisational outcomes (Goll *et al.*, 2008). The TMT's demographic characteristics influence the TMT's decision-making process because demographic characteristics are associated with many cognitive bases, values and perceptions that influence top managers' decision making (Marimuthu and Kolandaisamy, 2009b). This premise is consistent with research on managerial cognition, as discussed in Walsh (1995). Accordingly, Knight *et al.* (1999) suggest that managers' mental models will influence their pattern of decision making that ultimately informs the organisation's strategic management and performance (Navahandi, 2006).

A myriad of studies have examined the management of large firms with regards to entrepreneurial magnitudes such as strategy (Child, 1974; Certo *et al.*, 2006a, b; Golden and Zajac, 2001; Goll *et al.*, 2008), strategic change (Boeker, 1997; Wally and Becerra, 2001; Westphal and Fredrickson, 2001), succession (Boeker and Goodstein, 1993), innovation (Bantel and Jackson, 1989; Chi *et al.*, 2009; Huang and Lin, 2006), internationalisation (Crossland and Hambrick, 2011; Lin and Cheng, 2013a, b; Tihanyi *et al.*, 2000) and performance (Carpenter *et al.*, 2004; Cannella *et al.*, 2008; Crossland and Hambrick, 2011; Harrison *et al.*, 2002; Nielsen and Nielsen, 2013). These papers explore the TMT´s demographic characteristics, supporting the results with a reduced number of demographical traits, mainly age, functional background, education and tenure (Hambrick and Mason, 1984); whereas more recent studies have increased these sets of demographical characteristics by adding others such as culture, nationality, knowledge and skills (see Ellis *et al.*, 2005; Taylor and Greve, 2006). Initially, the Upper Echelon Theory approaches were characterised by only considering the TMT composition diversity based on the level dimension of the demographical managerial variables. However, new research has suggested the importance of the TMT´s background demographic traits diversity dimension and its impact on firm performance. Hence, diversity figures in new perspectives regarding strategic dialogue, helping managers to understand and address the needs of a demographically diverse custom base, stimulating a wider range of creative decision alternatives (Slater *et al.*, 2008).

Empirical evidence supports the notion that prior performance is a critical driver of organisational revolution (Finkelstein and Hambrick, 1996; Lin and Cheng, 2013b) and much research has explored the relationship between demographic characteristics and managerial performance (Carmeli, 2008; Hope *et al.*, 1999; Goll *et al.*, 2001). Yet this line of research, similar to the Upper Echelon Theory literature, is very controversial, as is evidenced by the contradictory findings. Two opposed paradigms explain this lack of

consistency. First, some manifest the impossibility of testing the hypotheses and conclude that this relationship is merely a black box (Hope *et al.*, 1999). Others admit the methodological weaknesses (Murray, 1989), defending either the level or the demographic diversity as explanatory factors of the highest level of performance.

Despite these controversial and inconsistent findings, research into TMT and its relevance as a potential determinant of firm performance continues to be an important focus of strategic management research (Goll *et al.*, 2001). It is a well-established fact that the end goals of TMT's efforts are to create a competitive advantage and ensure strong organisational performance (Marimuthu and Kolandaisamy, 2009a). Therefore, it is important to determine both the specific role of the TMT and its contributions to financial performance. As noted by Certo *et al.* (2006a, b), entrepreneurial environments require managers with an ability to make effective decisions, widely supporting and influencing effective firm performance.

In addition, the growing complexity and uncertainty of the current business environment has forced organisations to create more flexible systems to gain rapid and effective adaptation to change (Carpenter and Fredrickson, 2001). Consequently, team structures in organisations are increasing and their importance is undeniable (Cross *et al.*, 2008). This situation brings managerial challenges given the complexity involved in managing teams (Parry *et al.*, 1998). Team performance depends on several factors, including the organisational context and team composition (MacBryde and Mendibil, 2003). Team composition is one design factor that has received much attention due to its influence on team performance (Guzzo and Dickson, 1996), since a team implies a set of individuals working interdependently to accomplish a task (Cohen and Bailey, 1997). As a consequence, the importance of analysing the effects of TMT characteristics on performance has been reinforced. Moreover, managers value information on the ideal TMT composition structure and its influence on firm performance in guaranteeing both firm survival and growth. This fact has provoked renewed interest in the Upper Echelon Theory with Hambrick (2007) undertaking new research rooted in these new premises. Recent work grounded on human capital theory provides a basis for reversing two of the previous arguments regarding TMT characteristics (age and tenure) and firm performance. Thus, top management selection processes are rooted in the market of human capital in which decisions about the appropriate mix of executive knowledge and skills and the application of management knowledge and skills are made by both managers and the firm. Thereby, managers might make judgments about the current and potential performance of firms to assess the attractiveness of the opportunity with the firm. Firms must in turn make judgments regarding current and future executive performance (Ellis *et al.*, 2005).

As a result, there has been a growing interest in how team member differences in level demographical traits such as gender, nationality or personality affect team performance and ultimately firm performance (Horwitz and Horwitz, 2007). Through focusing on the assumption that each member of a team depends on the others to accomplish tasks, the analyses are concerned with the diversity of these TMTs (De la Torre-Ruiz *et al.*, 2011). Understanding TMT diversity is arguably fundamental in knowing whether this diversity in demographical traits improves team performance (Barsade *et al.*, 2000; Simons *et al.*, 1999). Accordingly, three main demographics characteristics have been analysed and include age, education and functionality.

The relationship between the top managers´ age and the organisation's performance has been widely documented in the demographic academic literature, with a number of

these studies concluding that the volatility of a company's earnings is conditioned by young members of top management. From this perspective, Child (1974) and Stevens *et al.* (1978) attribute these results to the smaller risk and greater commitment to the status quo that an older management defends. Therefore, Wiersema and Bantel (1992) suggest that the top manager's age is negatively related to strategic change. This is consistent with the work of Hambrick and Mason (1984) who argue that younger top managers are less committed to the status quo and more willing to accept change. In addition, Grimm and Smith (1991) purport that these younger managers are more receptive to risk-taking, pursuing more innovative growth strategies and, as a consequence, a high level of firm performance.

With regards to the education research, Burke and Light (1981) argue that abilities in learning, reasoning and memory decline with age; whereas Bantel and Jackson (1989) contend that younger managers would have superior technical knowledge because of more recent educational experiences. Becker highlights a higher level of education being linked to a greater receptivity of innovation and, similarly, Kimberly and Evanisko (1981) demonstrate a positive relationship between the formal education of top managers and the amount of innovation in the organisation. Hambrick and Mason (1984) argue that educated managers will have greater skill and expertise in information research activities. Similarly, Wiersema and Bantel (1992) suggest that a higher level of education is associated with higher information processing skills and the ability to discriminate among alternate stimuli. Bantel and Jackson (1989) purport that higher levels of education of the TMT will lead to more comprehensive decisions, resulting in greater innovation. Furthermore, the acquirement of a great level and diversity of tactic knowledge, means that top managers will be able to effectively lead the organisation (Taylor and Greve, 2006). The greater diversity in knowledge leads to the accomplishment of a great vision of different situations which are continually analysed and interpreted; therefore, favouring the necessary strategic actions and thus managerial results (Murray, 1989). This beneficial result, according to the demographic literature, can only be achieved through both a high educational level and a high educational heterogeneity in the TMT.

Finally, and as a result of the study of functional top management demographical characteristics, Westphal and Fredrickson (2001) consider that the functional background of top managers will increase the results of their companies. Studies related to the manager's knowledge demonstrate that the experience of individuals is related to a complex cognitive structure allowing the processing of more efficient information. These findings will favour more predictive, accurate and better organisational results (Stabell, 1978). Thus, top management selection processes are rooted in the market for human capital, in which decisions about the appropriate mix of executive knowledge and skills and the application of management knowledge and skills are made by both managers and firms (Srivastava and Lee, 2008).

As a result, and taking the Upper Echelon Theory as a reference, the research model in Figure 1 tests the influence of the top managers' level and demographic diversity on performance.

The following hypotheses are formulated as follows:

H1. There is a positive relationship between the top managers' demographic traits level diversity and firm performance. This positive influence is determined by a lower level of age, a greater educational level and a higher experience level of the TMT's members.

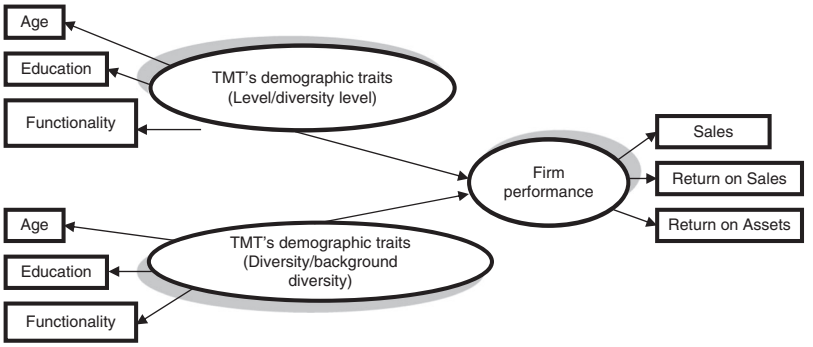

Figure 1.
Research model

H2. There is a positive relationship between the TMT's demographic background diversity and firm performance, depending on the TMT's age composition, educational background and professional background diversity.

3. Method

3.1 Data source

The population for the study consisted of multinational companies operating in the Latin American and European industrial context. At firm level, the present study uses TMTs as a unit of analysis. The TMT is defined as the hierarchy and the staff composition (Pegels *et al.*, 2000) and includes all those executives around and above the level of president, as well as any other officers who have served as directors of the company (i.e. vice-presidents, senior vice-presidents, vice chairs and CEOs).

Data on the composition of the TMT sample were obtained from specialised business journals in Latin America ("Who is Who in Latin-America") and Europe ("New Firm") during the period observed (2005-2011). The information provided by the journals was corroborated with the information obtained directly from the companies listed in those journals.

In addition, it was necessary to obtain the demographical traits of the TMTs' top managers (age, education and experience) (the Appendix). While much TMT research has used secondary databases such as Duns (Cohen and Bailey, 1997) to achieve the above goal, this study has used primary and secondary information sources. Secondary data includes company web sites, yearbooks and other similar sources (Who's Who in the World; Who's Who in Finance and Industry; Who's Who in Europe; Who's Who in Latin America), newspapers, specialised enterprise and financial magazines and company web pages (Westphal and Milton, 2000; Pegels *et al.*, 2000). Primary data was obtained from direct contacts with the top managers involved in the reference sample. Secondary data provided 90 per cent of the top manager demographical information, whereas only 10 per cent of that information was obtained from the primary database.

Data on company performance and its industrial sector was also obtained from two relevant databases SABI[1] and CNMV[2], as well as accounting balance sheet reports from the sample enterprises.

Even though an initial sample of 342 multicultural TMTs from large Latin American and European companies was considered, the final sample size resulted in 159 across 18 diversity industries from primary, secondary and service sectors. The high response rate was motivated by the data sources employed and from direct contact with the

respondents, the top managers. The sample size was justified by the following issues: first, the legal restrictions imposed by data protection laws of the countries involved which make it difficult to collect such information; second, the difficulty of gathering information for the whole TMT due to the high rotation of the top managers in the companies; third, data was collected between January 2005 and December 2011. Observations with missing data at the company or industry level were omitted from the data. However, the sample size can be considered appropriate to achieve an acceptable comprehension of the aim of the paper (Jehn *et al.*, 2000; Wiersema and Bowen, 2005).

3.2 Measures

Three TMT demographic magnitudes – age, education and experience – have been selected as predictor variables. Their measurement has been attained following the criteria established in the Upper Echelon Theory for each trait considered. Hence, age was codified attending to the biological age of each top manager (Pegels *et al.*, 2000; Wiersema and Bantel, 1992). The variable background education was classified into eight categories as compared with the literature, including sciences, engineering, maths, business, economics, law, arts and others (Carpenter and Fredrickson, 2001). The educational level was measured as a categorical variable indicating the level of education as recognised by the education administrations. The professional background has been categorised as a dummy variable based mainly on Wiersema and Bantel (1992) and the functional level was categorised as a dummy variable taking the value 1 if the TMT member carries out different functions within the company, and 0 otherwise.

Two different measures have been applied to aggregate the data at the team level following the criteria established in the Upper Echelon Theory. The TMT's average age was used as an age level diversity proxy. Blau's Index (1977) was used to measure the diversity of age composition, background education, functional level and professional background. Blau's index (1977) is a frequently used diversity measure for categorical variables (Bantel and Jackson, 1989; Keck, 1997; Pegels *et al.*, 2000) with the following expression $(=1-\sum (P_i)^2)$, P_i being the percentage of individuals in the ith category, taking values from 0 to 1, with high values indicating a greater diversity of a particular variable.

Company performance, the dependent variable, was measured using three indicators: the variation sales rate (Boeker and Goodstein, 1993; Salancik and Meindl, 1984), the average returns on assets (ROA) and return on sales (ROS) (Certo *et al.*, 2006a, b; Denis and Denis, 1995). These indicators are different from the standard indicators identified in the literature (Venkatraman and Ramanunjam, 1986), where predominant financial measures such as return on equity (ROE) are used (Díaz-Fernández, 2004). The lower volatility of the former firm measurements in relation to the latter, recognised by previous performance researchers, guided the final choice of ROA and ROS. The premise of the variation of the sales being an excellent indicator of firm performance is supported by Salancik and Meindl (1984) and Boeker and Goodstein (1993). ROA was calculated as net income divided by total assets, and ROS was obtained by dividing the profit by the sales. While ROA measures the firm's operative efficiency, ROS determines the gross profit obtained by each monetary unit sold.

Both ROS and ROA and sales are very sensitive. To correct this and to achieve an adequate estimation, this study has used relative performance and not absolute performance, which is supported by Wagner *et al.* (1984) and Denis and Denis (1995).

3.3 Modelling

The hypotheses formulated have been tested using panel data with 159 TMTs from Latin American and European multinational firms. A random-effects model was used since the Hausman test ($\chi^2 = 10.13$, $p = 0.081$) suggested that the random-effect estimator is preferred to the consistent fixed effects estimator (Gujarati and Porter, 2009). The method to estimate the random-effects model has been the generalised least-squares (GLS) estimation technique using STATA software v.13.

4. Results

Table I shows the means, standard deviations and the correlations between the variables. The mean age was 47.5 years with skewness (SK) of −1.17. Functional diversity ranged between 0 (no diversity at all) and 1 (highest diversity) with SK = 0.21. Background education diversity ranged between 0 and 0.83 with SK = −0.31. Education level diversity ranged between 0 and 0.79 with SK = −0.99. Age composition diversity was between 0 and 0.31 with SK = 0.18. According to the previous results, the educational background, education level diversity and age level diversity with left-skewed distribution reveal that most of the companies do not have a high diversity in their TMT, while the age composition diversity and professional background present a moderate right-skewed distribution. The index VIFs was obtained to test any presence of multicollinearity. The highest VIF was lower than five indicating no high collinearity among the variables included in the model (Green, 2000). As observed in Table I, the performance variables, ROA, ROS are correlated at 1 per cent of significance.

Table II reports the coefficient estimates for the effects of the demographic composition on the endogenous variables sales and performance variables ROS and ROA, respectively. To control the effect of the TMT size and the firm size, they are included in the regression models as the variable TMT size and the logarithm of assets, respectively. The χ^2 statistic indicates the overall significance of each model. As shown from the χ^2 statistic of Models 1 to 3, the models are significant, with a significance level below 5 per cent.

As shown in Models 1-3, the TMT's average age had a negative and significant influence on firm performance as measured by sales, ROS and ROA. This result is consistent with the Upper Echelon Theory literature which states that younger managers are more receptive to risk-taking, pursuing more innovative growth strategies and generating high levels of firm performance (Hambrick and Mason, 1984, Grimm and Smith, 1991; Ortiz-de-Urbina-Criado *et al.*, 2014). Therefore, the findings support *H1* for the predictor variable age level diversity and for the three managerial performance proxies. However, the TMT's age composition diversity was not significant for any of the models, revealing that a more rather than a less homogenous team composition in terms of age is preferable. Hence *H2* does not receive support when considering age composition diversity as a predictor, revealing the weaknesses in Murray's (1989) methodological argument.

From the models, the effect of the education level diversity is positive and significant when measuring performance by sales ($p < 0.1$) and ROS ($p < 0.05$) and not significant using ROA as a performance proxy ($p > 0.1$). The educational background diversity was positive and significant ($p < 0.05$) only for ROA as a performance measure. Hence, *H1* and *H2* for education level diversity and background education diversity, respectively, are partially supported.

Finally, the influence of the functional diversity and background professional diversity on corporate performance was analysed. The functional experience diversity showed a positive and significant effect ($p < 0.1$) on performance measured by ROS;

Table I.
Descriptive statistics and correlations

	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1	Eduback	0.41	0.18	1.00										
2	Edulev	0.33	0.11	0.35***	1.00									
3	Funclevel	0.39	0.21	0.021	0.032	1.00								
4	Profback	0.26	0.31	0.25***	0.19**	−0.36***	1.00**							
5	Agelev	47.5	6.51	0.41***	0.22***	0.027	−0.011	1.00						
6	Agecomp	0.18	0.061	0.010	0.238**	0.15**	−0.013	−0.23**	1.00					
7	Sales	215,512.6	770,720.8	0.15**	0.14**	0.14**	0.11*	0.08	−0.021	1.00				
8	ROA	0.075	0.23	0.42***	0.17	0.013	0.12**	−0.056	−0.013	−0.031	1.00			
9	ROS	0.090	0.71	−0.04	−0.09	−0.15**	−0.03	−0.12*	0.010*	−0.012	0.28***	1.00		
10	SizeTMT	4.96	1.38	0.13**	0.39***	0.17***	0.29***	0.06	0.125**	0.53***	0.05	0.012	1.00	
11	Assets	254,626	918,161.1	0.17***	0.15***	0.11**	0.12**	0.18***	−0.033	0.78***	−0.023	0.449	0.45***	1.00

Notes: Variables: Eduback, Educational background diversity; Edulev, Education level diversity; Funclev, Functional level diversity; Profback, Professional background diversity; Agelev, age level; Agecomp, Age composition diversity. Pearson correlation, Sig (2-tailed) *$p < 0.1$; **$p < 0.05$; ***$p < 0.001$

Table II.
Results of GLS: random-effects regression analysis for corporate performance

	Model 1 logSales $\chi^2 = 14.10$**	Model 2 ROS $\chi^2 = 15.15$**	Model 3 ROA $\chi^2 = 14.56$**
Age level	−0.04**	−0.012***	−0.0024***
	(0.027)	(0.006)	(0.0015)
Age composition	−2.090	−0.96	−0.074
	(3.41)	(0.82)	(0.19)
Education level	1.31*	0.45**	−0.081
	(0.08)	(0.032)	(0.52)
Educational background	0.81	0.22	0.052**
	(0.91)	(0.23)	(0.047)
Functional level	−0.26	0.32*	−0.0011
	(0.67)	(0.057)	(0.037)
Professional background	−1.14	0.21	0.092**
	(0.78)	(0.19)	(0.034)
SizeTMT	0.16*	0.036**	0.007**
	(0.057)	(0.011)	(0.0049)
Logassets	0.71***	0.036*	−0.003
	(0.044)	(0.020)	(0.005)
Intercept	6.84***	−0.47	0.24***
	(1.49)	(0.37)	(0.08)

Notes: p-value in parenthesis. *$p < 0.1$; **$p < 0.05$; ***$p < 0.001$

whereas, the professional background had a negative and significant effect on performance measured by ROA ($p < 0.05$). The functional level diversity and the professional background diversity were not significant for sales as a performance proxy. These results suggest both the complexity of resolving the demography black box and the weakness of the methodology applied.

The findings obtained by GLS regressions demonstrate that ROS as a corporate performance proxy captures the diversity within the TMTs, in terms of the functionality and education levels better than ROA, which captures the TMTs' diversity in terms of education and professional background more appropriately. Sales appear to be the firm performance measure with least power in capturing the influence of the demographic characteristics of the TMTs.

5. Discussion

The purpose of this research was to test the "real" influence of TMT diversity composition on firm performance in two dimensions (level and background) related to the controversy surrounding the Upper Echelon Theory. A lack of reliable findings and contradictory empirical results are evident in the literature, hence, providing a rationale for this research (Nielsen and Nielsen, 2013; Srivastava and Lee, 2008).

Despite previous research, this study is characterised by focusing on the structure of the whole TMT and not only on a concrete member of the team, such as the CEO, which is usual in the demographical literature (Bucholtz *et al.*, 2003; Crossland and Hambrick, 2011). It supports its findings by taking into consideration the influence of both the level and the diversity dimension of a TMTs' demographical characteristics, applying a random-effects model with performance indicators as endogenous variables different from the traditional one (financial (ROE)), and considering the TMTs from different countries and large firms belonging to various industrial sectors operating in an environment different to the usual US one.

Focusing on the controversy that evolved into the demographical black box, a possible explanation of the weakness of the results achieved by the demographical literature has been identified. Murray (1989) highlighted the methodological weaknesses of previous research whose demographic characteristics were often analysed by descriptive statistical analysis (Child, 1974; Díaz-Fernández, 2004). Only a limited number of studies use statistical and econometric techniques (Araujo and García, 1999). This methodological weakness produces demographic indicators which depend highly on the data and the sample design, and that are therefore not valid or reliable (Rosenger, 1968). Thus, the notion of the TMT used is highly criticised. Cohen and Bailey (1997) concluded in their review of teams' literature that most of the studies on TMTs have used Dun and Bradstreet's *Reference Book of Corporate Managements* to identify the team members and their demographic characteristics. This method leaves an open debate on whether top managers actually constitute a real team (Priem *et al.*, 1999).

Insofar as the relationship between TMT composition and firm performance, this inconsistency of findings may be due to the crucial moderating role played by other magnitudes (Goll *et al.*, 2008; Hambrick *et al.*, 2005). There are numerous studies that have highlighted the influence of the industry (Lieberson and O'Connor, 1972) and TMT skills, capabilities and experiences built in a specific firm environment on firm performance (Shen and Cho, 2005; Rock and Ahmed, 2014). Thus, other researchers defend the significant role played by variables related to TMTs' psychological traits, such as job-related skills and the knowledge to perform specific tasks (Humphrey *et al.*, 2009) on firm performance (Morgeson *et al.*, 2005). Recently, there has been growing concern about the relevance of TMT culture. As noted by Zeng *et al.* (2009), the diversity of culture is an essential feature of international project management. Moreover, cultural differences are a major factor affecting the success or failure of projects and, therefore, the firm's goals.

From a managerial perspective, and in agreement with theorists and practitioners, it seems plausible to assume that TMTs made up of managers with a high age diversity and different educational and professional backgrounds will result in a greater degree of knowledge, experience and perspectives which will, in turn, affect the quality of the decision-making process and, consequently, firm performance. Nevertheless, TMT diversity can play a double role in the firm, possibly making the effects of the positive synergies implicit in this demographic diversity favourable. Thus, TMT diversity can contribute through important management functions such as decision making both favourably – increasing the number, novelty and quality of the ideas and decisions adopted – and unfavourably, causing a breakdown at the core of the TMT as well as increased conflict. The results attained in our paper go beyond the extant demographic literature, revealing that not only is it necessary to have good TMTs but teams made up of highly qualified and diverse members of top management in order to thrive in today's complex and dynamic competitive environments. Furthermore, the demographic diversity of these TMTs influences firm performance in different ways according to whether these specific demographic characteristics (age, education and experience) are measured in terms of level or background, and according to the performance indicator used (ROS, ROA or logsales). Delving more deeply into this influence of TMT diversity on firm performance according to the performance indicator employed, we can see how background, education and experience diversity have a significant positive influence on ROA, while diversity in the levels of education and experience have a significant positive influence on ROS. Moreover, diversity in TMT age level has a significant negative effect for the indicators employed in the

measuring of performance. These results indicate that while ROA is the best indicator of performance to capture the influence of the TMT's background diversity on performance, ROS is the best indicator of the TMT's levels diversity. Logsales is the worst of the indicators used to capture the effect of this demographic diversity of the TMT on the performance it fosters. According to the results, we consider that the main contribution of our paper both for firms and their top management, as well as for society in general – the main receiver of the shares of these bodies and their managers – is to contribute a possible response to two relevant topics and a widely tackled but not settled issue in the academic literature: management and organisational performance, and how to achieve an optimum organisational performance from this management. Accordingly, our paper has identified not only those management elements that influence performance, but also how a high level of performance can be attained through a specific degree of diversity in TMT composition. These results have been tested by using a different industrial context to the usual US one; that is, Europe and Latin America. This can be of great help both in these business environments and those that are close to it.

As a result of this paper, future research avenues may include an extension to the research model with a further consideration of the issues and arguments outlined above. After applying the random-effects regression model statistical technique, the results show a partial confirmation of the hypotheses formulated in the theoretical model proposed. Therefore, the test of the theoretical model and the research hypotheses concludes that the statistical significance of the age level variable is significant for all the performance indicators (ROA, ROS and sales), although it is not the case for age diversity composition. The educational diversity and the functionality diversity levels are significant for ROS as performance measures, whereas the educational background and professional background diversity levels are significant for ROA. This result is due to the definitions themselves of ROS and ROA variables. In fact, ROS includes sales in its definition, whereas ROA is focused on the company assets.

In order to mitigate the above, there is a need for further research applying a structural equation modelling statistical technique. It is argued that this would allow for a consideration of the higher-order component models which can capture the multidimensional structure of TMTs and its influence on the firm performance multidimensional component, increasing the consistency of the results.

Child and Shumate (2007, p. 29) note, "Knowledge management is an important organisational consideration because it increases organizations' viability, competitive success, and performance outcomes". Thus, according to demographical researchers (Hambrick and Mason, 1984; Hambrick, 2007; Goll *et al.*, 2008; Lin and Cheng, 2013a, b), and successful top managers, the knowledge of their TMT composition as well as their influence on firm performance are relevant for entrepreneurial purposes. The results demonstrate which constructs might influence firm performance, revealing the parameters that are needed to achieve the optimum performance level. Thereby, the present study constitutes an attempt to advance the literature on TMT composition and its influence on firm performance.

Notes

1. SABI, Sistema de Análisis de Balances Ibéricos. 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.

2. CNMV, Comisión Nacional del Mercado de Valores. 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 Spain's Ministry of Economy and Finance.

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Appendix

Variables	Definition	Measure	Literature
Educational background	The variable is defined as a categorical variable with eight categories including: 1 = Science; 2 = Engineering; 3 = Mathematics; 4 = Business; 5 = Economics; 6 = Law; 7 = Arts; 8 = Others	Diversity measure: Blau Index ($=1-\sum (P_i)^2$), P_i the percentage of individuals in the ith category	Carpenter and Fredrickson (2001); Wiersema and Bantel (1992)
Education level	The variable is defined as a categorical variable with four categories as recognised by the Education Administration: 1 = Primary Education; 2 = Secondary Education; 3 = High Education; 4 = Vocational training	Diversity measure: Blau Index ($=1-\sum (P_i)^2$), P_i the percentage of individuals in the ith category	Carpenter and Fredrickson (2001); Wiersema and Bantel (1992)
Age level	Age variable defined in years	Average: arithmetic mean	Tacheva (2007)
Age composition	Age variable defined as a categorical variable: 1 = Lower than 25; 2 = 26-35; 3 = 36-50; 4 = over 50	Diversity measure: Blau Index ($=1-\sum (P_i)^2$), P_i the percentage of individuals in the ith category	Díaz-Fernández (2004)
Functional background	The Functional background variable is defined as a dummy variable taking the value 1 if the top manager carries out different functions within the company and 0 otherwise	Diversity measure: Blau Index ($=1-\sum (P_i)^2$), P_i the percentage of individuals carrying out different functions in the company	Wiersema and Bantel (1992)
Functional level	The Functional level variable is defined as a dummy variable taking the value 1 if the top manager carries out different functions within the company and 0 otherwise	Diversity measure: Blau Index ($=1-\sum (P_i)^2$), P_i the percentage of individuals carrying out different functions in the company	Wiersema and Bantel (1992)
Professional background	The functional background variable is defined as a dummy variable taking the value 1 if the top manager has been working in different activity sectors and 0 otherwise	Diversity measure: Blau Index ($=1-\sum (P_i)^2$), P_i the percentage of individuals carrying out different functions in the company	Wiersema and Bantel (1992)
ROA	ROA measures the firm's operative efficiency	ROA was calculated as net income divided by total assets	Boeker and Goodstein (1993); Salancik and Meindl (1984)
ROS	ROS determines the gross benefit obtained by each monetary sold unit	ROS was obtained by dividing the profit by the sales	Boeker and Goodstein (1993); Salancik and Meindl (1984)

Table AI. Description and measure of TMTs demographic variables and firm performance variables

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