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CEO-TMT interaction: Does tenure and age affect ambidexterity dynamism?[a]

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Abstract

The aim of this study is to clarify the influence of the CEO, the top management team and their interactions on the dynamism of organizational ambidexterity. We argue that ambidexterity is a dynamic capability that enables firms to become aligned with their environment. We examine this phenomenon in the context of the current economic crisis, with particular reference to SMEs. We propose tenure and age as characteristics of business elites that help to explain ambidexterity dynamism. In SMEs, the tenure and age of CEOs and interactions with top management team characteristics play a decisive role in the decision-making process, and therefore, in how the company adapts its orientation to ambidexterity. Through the study of 91 SMEs, we show that the characteristics of the CEO combined with the traits of the TMT are relevant for understanding ambidexterity dynamism.

Key words: ambidexterity, tenure, age, CEO, top management team, dynamic capabilities.

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Introduction

Just as ambidextrous people are equally versatile in the use of both their right and left hands, a firm is ambidextrous when it is able to effectively explore and exploit knowledge. An ambidextrous organization skillfully manages the trade-offs and contradictions needed to exploit and explore, as well as the paradoxes that exist between an orientation towards efficiency, refinement and productivity, and an orientation towards innovation, experimentation, variation, change and creativity (March, 1991). The relevance of ambidexterity relies on its positive link with firm performance and long-term survival (Raisch and Birkinshaw, 2008; O´Reilly and Tushman, 2008; 2011; Simsek, 2009; Piao, 2010).

In contrast to the static conceptualizations of ambidexterity, O'Reilly and Tushman (2011) define it as a dynamic capability. They argue that it allows firms to sustain their competitive advantages in the face of environmental transitions (O'Reilly and Tushman, 2008). Environmental conditions change over time and when firms develop this ambidextrous capability, they are able to adjust their exploration and exploitation orientation to these new requirements. Our research extends this idea, focusing on ambidexterity dynamism or the firm's ability to modify their orientation towards exploration and exploitation, adapting their ambidexterity to different environmental conditions.

As a dynamic capability, it embodies a complex set of routines and specifically the ability of upper echelons to manage the contradictions and trade-offs needed to simultaneously balance exploration and exploitation efforts, shaping them to embrace changes in the firm's environment (O´Reilly and Tushman, 2011). The dynamic capability approach emphasizes the key role of top level management in appropriately adapting, integrating and reconfiguring organizational skills and resources to align them with changing environments (Eisenhardt and Martin, 2000; Lavie, 2006; Teece, 2007, Teece, Pisano and Shuen, 1997). Ambidexterity dynamism requires managers that possess specific characteristics, which allow them to accurately sense environmental changes, thus enabling them to align and seize them by adapting, integrating and reconfiguring the firm's tangible and intangible assets (O'Reilly and Tushman, 2011).

Also, prior research based on the upper echelons theory (Hambrick and Mason, 1984) focuses on the function of managers in achieving ambidexterity and, particularly, on their relevant role in the case of small and medium-sized enterprises (SMEs). Lubatkin *et al.* (2006) argue that SMEs generally lack the amount of slack resources and the kind of hierarchical administrative systems that can help them to address the contradictory information and knowledge processes that ambidexterity demands, and as a consequence, SMEs have to rely more on managerial processes to attain ambidexterity. In contrast with other antecedents –such as the dual or parallel structures available to larger firms–, this study proposes that business managers play a critical role in explaining ambidexterity in SMEs. Cao, Simsek and Zhang (2010) enrich this view by specifying a model that posits that the Chief Executive Officer (CEO) in SMEs is not the same as any other member of the Top Management Team (TMT) in influencing ambidexterity. They present a model in which the CEO and the TMT affect the organization as interrelated systems of constructs that explain ambidexterity. Along similar lines, Tushman, Smith and Binns (2011) argue that the trade-offs to be made between exploration and exploitation rely on the CEO, who is vital in balancing these competing demands, particularly when times are hard. Our study extends the idea that, in SMEs, top managers are essential to understanding ambidexterity. We exthend this line of research on the joint impact of CEO characteristics and those of TMTs in

explaining SME behavior. With this aim in mind, we analyze the role of top management, with a specific focus on the impact of CEOs, and their interactions with the TMT in shifting their exploration and exploitation orientations in the face of environmental changes.

In order to establish the connection between management characteristics and ambidexterity dynamism, we base our ideas on the upper echelons theory. Specifically, we propose that analyze how CEO demographic characteristics and TMT demographic diversity affect the decision-making process, allowing managers to sense environmental changes and to seize them, fostering strategic change or hindering and obstructing it. We thus focus our study on two characteristics: tenure and age. Both, tenure and age are related to the ability of upper echelons to process information (being able to sense environmental changes), looking for alternatives and making strategic decisions that imply different levels of risk-taking, thereby enabling to seize the environmental changes (McClelland, Liang and Barker III, 2010; McClelland, Barker III and Oh, 2011; Simsek, 2007). Tenure and age have been negatively linked with TMT risk-taking behavior (Simsek, 2007), and in the case of the CEO, they have been positively linked to risk-averse behaviors (McClelland *et al.* 2010; McClelland *et al.* 2011). We therefore focus on age and tenure because ambidexterity dynamism implies change in the firm's exploitation and exploration orientation; trade-offs between short-term and long-term success, between certainty and uncertainty, between well-known alternatives focused on efficiency and improvements aligned with risk-averse behaviors, and uncertain alternatives that embrace discovery and creativity that fit with risk taking behaviors.

In short, the aim of this study is to analyze how CEO age and tenure, and their interactions with TMT age and tenure diversity, may explain their ability to obtain ambidexterity dynamism in order to respond to the changing environment, ensuring their survival in the short and long-term. This study aims to enhance both the literature on ambidexterity and on upper echelons theory. On the one hand, we examine the role of the specific compositions of upper echelons in achieving a dynamic capability such as ambidexterity. On the other, we further develop the idea of interactions between CEO and TMT characteristics in understanding the influence of upper echelons in SMEs. We focus on tenure and age as key demographic variables linked to the ability to sense environmental change and the capacity to respond to it.

The following sections firstly introduce the concept of ambidexterity and its dynamic nature and develop the study hypotheses based on the tenure and age of the CEO and the interaction with TMT tenure and age diversity. We describe the methodology used in the empirical study, along with detailed measurements of dependent, moderating and independent variables, and analyze the main results obtained from the study. The paper concludes with the implications of the research.

Managers and ambidexterity dynamism

Raisch and Birkinshaw (2008) posit that firms achieve ambidexterity by synchronizing exploitative and explorative activities, either by engaging in only one activity at a time or by addressing both simultaneously and internally. The former could be made possible by externalizing either exploitative or explorative activities through outsourcing or alliances (Lavie and Rosenkopf, 2006; Rothaermel and Deeds, 2004), or by temporary periods of exploitation and periods of exploration, known as sequential ambidexterity (Venkatraman, Lee and Iyer, 2007). With regard to the latter, the literature focuses on approaches that enable internal and simultaneous ambidexterity: architectural separation or structural solutions that allow the two activities, explorative and exploitative, to be carried out in different organizational units; contextual solutions that allow the two activities to be pursued within the

same unit (Birkinshaw and Gibson, 2004; Gibson and Birkinshaw, 2004); and leadership-based solutions that make the top management team responsible for reconciling and responding to the tensions between the two activities (Lubatkin *et al.* 2006; Cao *et al.* 2010). We focus on the simultaneous option because, according to O´Reilly and Tushman (2008), ambidexterity only becomes a dynamic capability if the firm's exploitation and exploration activities are strategically integrated.

The study by O´Reilly and Tushman (2008) explains the similarities between the literature on dynamic capabilities and the literature on ambidexterity. These authors state that dynamic capabilities are reflected in the organization´s ability (manifested in the decisions of senior management) to maintain ecological adequacy and, when necessary, to reconfigure existing assets and to develop the new skills needed to address emerging threats and opportunities (Eisenhardt and Martin, 2000; Winter, 2003). They claim that, from a strategic perspective, achieving long-term success requires firms to possess not only the operational capabilities and competencies to compete in existing markets, but also the ability to recombine and reconfigure assets to adapt to emerging markets and technologies. Dynamic capabilities include specific activities that derive from the actions of senior managers to ensure learning, integration and, when required, reconfiguration and transformation. O´Reilly and Tushman (2008) argue that dynamic capabilities are at the heart of a firm's ability to be ambidextrous, and of its ability to align their exploration and exploitation orientations with the environment. From our perspective, this line of research focuses on ambidexterity not as a state, but as a dynamic construct that enables firms to adapt to environmental requirements. Therefore, ambidexterity dynamism focuses not on the capability achieved for a given period of time, but on the changes in the emphasis towards exploration and exploitation, reflecting the efforts of the firm to adapt to a new environment. It is obtained by modifying the effort towards exploration or exploitation and also the balance between them (Cao, Gedajlovic and Zhang, 2009)

Ambidexterity, or to simultaneously exploit and to explore, is inherently linked to the idea of tension, paradox and contradictions, as it demands that senior leaders manage completely different and inconsistent organizational alignments (Tushman and O´Reilly, 1997). The essential success factors needed to succeed in terms of exploitation imply a short-term perspective, efficiency, discipline and incremental improvement. The alignment of competencies, systems, structure and culture to execute this strategy is completely different from the alignment needed for exploration, where the major success factors emphasize a longer term perspective, more autonomy, flexibility and risk-taking, and less formal systems and control (O´Reilly and Tushman, 2008:190).

O´Reilly and Tushman (2008) argue that the capabilities required for firms to be successfully ambidextrous need to be consistent with Teece´s tripartite taxonomy of sensing, seizing and reconfiguring (Teece, 2007). They conceive the senior team as having the role of achieving a coherent alignment of competencies, structures and cultures to engage in exploration and exploitation: they propose a top management with sufficient cognitive and behavioral flexibility to establish and nurture the two, and to align them both with environmental demands. In this sense, *sensing* opportunities and threats, particularly in rapidly shifting markets, requires scanning, searching and exploration. It implies an upper echelons that is able to discern and appreciate signals of change that refuse to lock into past explanations, and which challenge the status quo (O´Reilly and Tusman, 2008). *Seizing* opportunities is about being able to capture the threats and opportunities. It implies designing alternatives and making choices that will imply risk-taking alternatives or risk-adverse ones (O´Reilly and Tushman, 2008). Lastly, *reconfiguring* allows organizations to achieve long-term success and requires leaders to reallocate resources to adapt to the new threats and

opportunities and to move away from mature, declining businesses that imply lower levels of risk toward emerging growth opportunities that imply uncertain outcomes.

Therefore, there is no doubt about the essential role of senior managers in achieving ambidexterity and in aligning it to the environment. But can the CEO alone explain ambidexterity dynamism in SMEs? According to Tushman *et al.* (2011), CEOs play a central role in achieving ambidexterity. They state that balancing the needs of exploitation and innovation efforts are central to the role of the CEO, who must control and manage the tension between the demands of exploration and exploitation, maintaining multiple and conflicting strategic agendas.

However, Cao *et al.* (2010: 1274) state: "*It is unlikely that the CEO alone, due to bounded rationality, can fully address the contradictory information and knowledge inputs that ambidexterity demands".*

Following this line of thought, we argue that in this kind of firm, the role of the TMT, along with that of the CEO, is clearer than in large organizations. Their TMTs are closely involved in strategic decision-making and implementation, with a frequent and intense communication exchange. They usually assume both operating and strategic roles and thus experience the tensions that arise in the pursuit of an ambidextrous orientation (Cao *et al.* 2010; Ling *et al.* 2008; Lubatkin *et al.* 2006). As such, the ability of CEOs in SMEs to promote an ambidextrous orientation needs to be taken into account in conjunction with the effect of the TMT (Cao *et al.* 2010).

Based on these studies, we propose a model in which the CEOs characteristics help to explain their ability to sense new environmental opportunities and threats and to seize them by adapting their exploration orientation and exploitation orientation to the new environment. However, it is important to state that these CEO characteristics interact with those of their TMT in their ability to analyze, discern and appreciate the contradictory information of environmental change and the level of uncertainty and risk that aligning ambidexterity to environmental changes demands.

The relevant role of managers in the firm's strategic choices is in line with the *Upper Echelons Theory* that places emphasis on the composition and processes of executives in understanding several results (Finkelstein and Hambrick, 1990; Hambrick and Mason, 1984; Hambrick, Cho and Chen, 1996; Sánchez, Sánchez and Escribá, 2010; Sosik, Juzbasich and Chun, 2011; Talke, Salomo and Rost, 2010). These studies serve as the basis for an important body of knowledge on the study of the demographic characteristics of managers (Finkelstein, Hambrick and Canella, 2009), given that top management teams do not always make decisions based on economic optimization, but rather rely on their perception of the environment, cognitive processes of interpretation and experience and personal values. We propose that tenure and age are two demographic characteristics linked to the capability of upper echelons to achieve dynamism in ambidexterity, as they foster or inhibit the ability to sense, seize and reconfigure. In fact, the demographic characteristics of tenure and age have been linked with change, innovation and with risk-taking behavior (Simsek, 2007). In the case of the CEO, they are positively linked to existing status quo and risk-averse behaviors (McClelland *et al.* 2011). McClelland *et al.* (2010) find that CEO age and CEO tenure are the two individual characteristics that have an effect on their commitment to the status quo. They argue that CEOs with shorter career horizons (measured by their age) will adopt risk-averse strategies. They also propose that, in terms of CEO tenure, their paradigms will become increasingly obsolete as their tenure increases, which can be damaging to future performance in dynamic industries.

We posit that tenure and age are related to Teece´s tripartite taxonomy of sensing,

seizing and reconfiguring (Teece, 2007) and to the ability of managers to sense opportunities and threats (which requires a senior management team that facilitates challenges to the status quo), seize or make the right decisions (which in some occasions requires risk-taking propensity) and reallocate resources. We thus posit that CEO tenure and age and its combined impact with that of TMT tenure and age diversity could affect levels of ambidexterity dynamism.

While many studies on upper echelons focus on TMT diversity and its impact on certain organizational outcomes, only a few studies look simultaneously at the TMT and CEO, recognizing the special role of the CEO in some contexts where this figure is especially powerful (Nielsen, 2010). Our study forms a part of this promising line of research on the joint impact of TMT diversity and the CEO, based on the idea that while team-level diversity might not have a direct effect on firm strategy and performance, it may moderate the effects of CEO characteristics on firm behavior (Nielsen, 2010), in our case, on the changes in organizational ambidexterity.

This study therefore focuses on tenure and age as two key dimensions of CEO and TMT that can affect the ability of top management to process information, detect signals of dynamism in the environment and change the firm's ambidextrous orientation (Musteen, Barker III and Baeten, 2010).

The CEO and the moderating effect of TMT diversity: the role of tenure and age

Research on upper echelons has extensively studied executive tenure. Finkelstein and Hambrick (1990) relate tenure with the strategic decision-making process. Furthermore it is use as a proxy for commitment to the status quo, informational diversity and attitudes toward risk (Carpenter, Geletkanycz and Sanders, 2004). We argue that long-tenured CEOs will have difficulties in sensing and seizing environmental changes and in adapting their ambidexterity to it.

On the one hand, long-tenured CEOs have more restrictions with regard to information processing (Finkelstein and Hambrick, 1990). This is because they develop their own methods over the years, becoming linked to their own existing paradigms for analyzing and processing information (Finkelstein and Hambrick, 1990). Prior studies argue that the longer the tenure of the CEO, the more likely it will be that he/she develops a strong culture among the TMT, develop shared socialization and mutual understanding, a phenomenon linked to strategic myopia (Schein, 1985). Consequently, they will lack some of the abilities needed for *sensing* environmental changes.

On the other hand, previous research demonstrates that CEO tenure is positively associated with CEO commitment to the status quo (McClelland *et al.* 2010), is negatively related to attitudes towards change (Finkelstein and Hambrick, 1990; Musteen, Barker III and Baeten, 2006) and to the propensity to take risks (Simsek, 2007). Executives who have dedicated their professional lives to one company increase their commitment to their strategies and as well as increasing risk aversion (Finkelstein and Hambrick, 1990). Consequently, long-tenured CEOs will be committed to a course of action that they have already proven and have defended during their time spent as CEO, making it difficult to *seize* and *reconfigure* in the face of environmental changes.

As a result, long-tenured CEOs will lack the advantage of cognitive and behavioral flexibility to align ambidexterity with environmental demands. *Sensing* opportunities and threats, particularly in rapidly shifting markets, requires a CEO that is able to discern and appreciate signals of change that refuse to lock into past explanations and challenges the status quo (O´Reilly and Tushman, 2008). Long-tenured CEOs will find it difficult to achieve

ambidexterity dynamism with any degree of success. In addition, they will be committed to balancing risk-taking, which has been useful in the past, with the level of exploration and exploitation, so they are more likely use the same ambidexterity orientation that has already worked in the past.

Therefore:

Hypothesis 1: CEO tenure has a negative relationship with the SMEs ambidexterity dynamism

Age is expected to influence strategic decision-making perspectives and choices. Psychological arguments suggest that with age, managers may become less flexible and it will be harder for them to learn new issues and to promote innovative ideas within the firm, increasing rigidity and resistance to change (Wiersema and Bantel, 1992; Musteen *et al.* 2006). Moreover, older executives, at the end of their careers, are worried about security and will reject risky actions (Hambrick and Mason, 1984; Musteen *et al.* 2006). In this sense, we argue that the CEO's age will affect their ability to seize opportunities and reconfigure assets. Seizing implies designing alternatives and making choices that will imply risk-taking alternatives or risk-adverse ones. Reconfiguring implies a new balance between known outcomes and uncertain ones (O´Reilly and Tushman, 2008).

In line with previous research, McClelland *et al.* (2010) claim that, because older executives possess a well-developed cluster of organizational and strategic problem-solving formulas, which have worked well in the past, they may become increasingly convinced of the enduring quality of those problem-solving methods, and so develop an increasing commitment to the strategic and procedural status quo. Young CEOs can afford to be risk-seeking even if they fail because a young CEO has a longer career horizon in which to recover from a loss and go on to achieve success. However, older top executives tend to be risk-averse because they have shorter career horizons in which to recoup losses (Hambrick and Mason, 1984; MacCrimmon and Wehrung, 1990; Wiersema and Bantel, 1992; McClelland *et al.* 2010). Matta and Beamish (2008) demonstrate that CEO career horizons measured by age affect the likelihood of risk-taking, in their study of international acquisitions.

Efforts have been made to link this demographic variable to team processes. *CEO age* is positively associated with the CEO's commitment to the status quo (Hambrick, Geletkanycz and Fredrickson, 1993; Carpenter et al., 2004) and negatively associated with attitude towards change (McClelland *et al.* 2010). Younger CEOs adopt more risky strategies (Hambrick and Mason, 1984; MacCrimmon and Wehrung, 1990; Wiersema and Bantel, 1992) because their career horizons allow them to look for long-term results. However, older CEOs will focus mainly on an exploitative orientation with results in the short-term decreasing their dexterity in exploring and exploiting. We therefore posit the following:

Hypothesis 2: CEO age (career tenure) has a negative relationship with the SME ambidexterity dynamism.

We have argued that long-tenured CEOs will have difficulties in sensing and seizing environmental changes and in adapting their ambidexterity to these changes. In terms of sensing, this is because long tenured CEOs appear to be linked to their own existing paradigms and are characterized by scarce informational diversity. With regard to seizing, long tenure is related to an adverse attitude toward change and risk (Finkelstein and Hambrick, 1990; Musteen et al., 2006; Simsek, 2007).

In this sense, diversity in the top management team can be beneficial for the company from a decision-making perspective (Cannella, Park and Lee, 2008; Nielsen, 2010; Talke *et*

al. 2010). Van Knippenberg and Schippers (2007) conceptualize the diversity of groups as differences between individuals on any attribute that may lead to the perception that any other person is distinct from oneself.

We propose that diversity in TMT tenure will increase the richness of information sources and analysis and TMT age diversity will increase the likelihood of risk-taking propensity by including different career horizons in decision-making and diversity in the commitment to new projects and alternatives.

With respect to TMT tenure heterogeneity Wiersema and Bantel (1992) argue that TMT tenure homogeneity suggests shared socialization and similar work experiences, whereas heterogeneity will bring a variety of information sources to the team, thereby increasing the richness of outlooks.

In addition, Simons, Pelled and Smith (1999) claim that tenure heterogeneity, as a job relatedness characteristic, is a type of diversity that captures distinct experiences, skills, or perspectives relevant to cognitive tasks at work that increases the total pool of task-related skills, information, and perspectives. Along the same lines, Milliken and Martins (1996) state that arguments for the impact of team tenure heterogeneity on organizational actions are based on the idea that tenure heterogeneity reduces groupthink and increases creativity, while the empirical evidence is controversial.

Barkema and Shvyrkov (2007) propose that decision-making processes would benefit from debate and this task-related debate is especially likely with tenure heterogeneity that includes diversity in experience, skills, values, and beliefs. They find support for the idea that, debate is more likely to be fruitful when it draws on different experiences and perspectives that are relevant to a task rather than on less relevant differences in viewpoint.

We can therefore expect that TMT tenure diversity will allow us to sense environmental changes and seize them through the development of innovative and novel alternatives; however, the literature does not relate TMT tenure diversity to the ability to promote actions that allow for the capture of opportunities and to take actions that allow reconfiguration.

Diversity in TMT age can bring this ability to the team. Wiersema and Bantel (1992) argue that TMTs with a heterogeneous composition in terms of age will stimulate the consideration of change.

Richard and Shelor (2002) found a positive relationship between TMT age diversity and sales growth and they posit that age diversity may enhance organizational actions and outcomes. Rivas (2012) found that age diversity is not only related to risk taking, increasing the likelihood of a firm's internationalization but it also increases implementation success. In this sense, they rely on Kang, Cheng, and Gray's (2007) argument on the benefits of TMT age diversity: while an older group can provide experience and resources the middle group can carry out the responsibilities and the younger one provides the necessary energy to plan ahead. In addition, Escribá, Sánchez and Sánchez (2009) state that age diversity, and specifically younger managers, will be able to act on environmental opportunities, and may tend to pursue more proactive behaviors.

However, together with this bright side of tenure diversity and age diversity, there is also a dark side to diversity. Wiersema and Bantel (1992) indicate that a high level of diversity in tenure and age among the members of a team can lead to a lack of consensus in decision-making; therefore, too much variance in the permanence of the top management

team in SMEs will be negative for making faster decisions, which consequently affect the firm's capacity to reach a consensus for adapting to changes in the environment, or align their ambidexterity with the environment. Along the same lines, O´Reilly and Tushman, (2011) found that consensus in the senior team on ambidextrous strategy is important to be successful in this facet. However, longer tenured CEOs will help the team to reach a consensus on decisions (Simsek, 2007). TMT diversity in tenure will allow sensitivity to environmental changes, noticing signals from different sources and perspectives, although this is counteracted by the tendency of the long-tenured CEO to depend on well-known explanations and myopia. At the same time, relying on tenured CEOs will allow a more comprehensive decision-making process, enabling SMEs to benefit from a decision process characterized by brainstorming sessions, a number of considered alternatives and a degree of analysis (Miller, Burke and Glick, 1998).

Hence, although tenure heterogeneity and age heterogeneity can counteract some of the negative effects of a long tenured CEO, they may act in combination. Therefore, a potential three-way interaction effect (TMT tenure diversity plus TMT age diversity) should decrease the negative effect of CEO tenure on ambidexterity dynamism. This leads to the following hypothesis:

Hypothesis 3: Interaction effects of TMT tenure diversity, and TMT age diversity serves to decrease CEO tenure effects on ambidexterity dynamism in such a way that high levels of TMT tenure diversity will reduce the negative relationship between CEO tenure and ambidexterity dynamism when TMT age diversity is high.

We have argued that CEO age will affect their ability to seize opportunities and to reconfigure assets. Seizing implies designing alternatives and making choices that will imply risk-taking alternatives or risk-adverse ones. Reconfiguring implies a new balance between known outcomes and uncertain ones (O´Reilly and Tushman, 2008). Both seizing and reconfiguring appear to be contrary to the old CEO commitment to the strategic and procedural status quo (McClelland et al, 2010; Matta and Beamish, 2008) and to their short-term career horizons.

In that sense an old CEO can benefit from TMT tenure diversity that increases the total pool of task-related skills, information, and perspectives (Simons et al. 1999) and from beneficial debate (Barkema and Shvyrkov, 2007). So we can expect that TMT tenure diversity will allow seizing environmental changes through the development of innovative and novel alternatives; however, TMT tenure diversity may not allow the attitude that promote actions of reconfiguration that are needed for adapting exploitation and exploration to the environmental changes.

Diversity in TMT age can bring this ability to the team. Younger CEOs adopt more risky strategies (Hambrick and Mason, 1984; MacCrimmon and Wehrung, 1990; Wiersema and Bantel, 1992). Their career horizons allow them to look for long-term results. Herrmann and Datta (2005) argue that older executives are typically more risk averse, exhibiting a preference for greater financial and career security than younger executives so they are less able to get into new ventures

Moreover, they should not only able to look for more innovative options but to take the steps and actions to implement them. Some studies posit that age diversity may enhance organizational actions, implementation success and outcomes (Richard and Shelor, 2002; Rivas, 2012). Kang et al. (2007) argue that younger directors will provide the necessary energy to plan ahead, while Escribá et al. (2009) demonstrate that younger managers have a

more proactive strategic orientation by being able to act on environmental opportunities.

An older CEO will lack the ability to learn about new issues and promote innovative action within the firm (Wiersema and Bantel, 1992; Musteen et al. 2006), but this person does have the experience to make it possible to benefit from the creativity and innovative choices of a diverse tenure team (Finkelstein et al. 2009). Mature CEOs are linked to a tendency to evaluate information accurately (Hambrick and Mason, 1984) and have the power to take actions and maintain them over time (Finkelstein et al. 2009). As a result, older CEOs will benefit from a diverse TMT tenure because this will allow him or her to better learn about new aspects needed to seize environmental changes. Older CEOs with short-term career horizons will benefit from TMT diversity in terms of age that will allow them to take the actions that novel projects may demand. Consequently, the interaction between an old CEO and a TMT that is diverse in age and diverse in tenure makes it possible to adapt the firm's orientation towards ambidexterity that can be aligned with the environment.

So, although tenure heterogeneity and age heterogeneity can each counteract with some of the negative effects of a mature CEO, they may act in combination. Thus, a potential three-way interaction effect (TMT tenure diversity plus TMT age diversity) should decrease the negative effect of CEO age on ambidexterity dynamism. This leads to the following hypothesis:

Hypothesis 4: Interaction effects of TMT tenure diversity and TMT age diversity serve to decrease CEO age effects on ambidexterity dynamism in such a way that high levels of TMT tenure diversity will reduce the negative relationship between CEO age and ambidexterity dynamism when TMT age diversity is high.

Methods

Sample

The data were obtained through surveys conducted with different firms. Using the SABI[1] database, we identified 814 SMEs (20 to 250 employees). Before the interviews, we conducted a pretest of the questionnaire with a group of managers, and from their responses we made improvements to ensure that questions were clear, relevant and were interpreted as intended. We contacted senior executives of the firms in our database via telephone and, if they agreed, we arranged a meeting with the CEO and a member of his or her team (in order to reduce informant bias, in 100% of the firms surveyed, the opinions of two managers were provided: the CEO and another member of the TMT). We obtained a sample of 91 firms. Interviews were conducted between July 2009 and May 2010. The SMEs in the sample have on average 48 workers, an annual turnover of €5,999,000 and have been in operation for an average of 32 years.

Variables

Dependent variable: Ambidexterity dynamism

As in the majority of studies conducted to date on ambidexterity, the hypotheses of this paper are framed in terms of the exploitative and exploratory orientation of firms (Benner and Tushman, 2003; He and Wong, 2004; Lubatkin *et al.* 2006). Ambidexterity was measured using constructs from the firm's orientation to exploration and exploitation. These were measured with the scales proposed by Lubatkin *et al.* (2006), whose origins lie in the original scales of He and Wong (2004) and Benner and Tushman (2003). Appendix 1 shows the process of refining and validating the scales.

Ambidexterity dynamism was measured as changes in the *combined dimension* (CD)

of ambidexterity. The CD of ambidexterity refers to a combined magnitude or *combined level* of exploration and exploitation in firms. CD is calculated by multiplying the level of exploration and exploitation (measured using a 1-5 Likert scales). It is understood that a firm will be more ambidextrous if the result of multiplying exploitation and exploration is high. This form of measurement is based on Lubatkin *et al.* (2006) and Cao *et al.* (2009). We calculated ambidexterity dynamism by finding the difference between CD at the moment *t* (during the crisis) and CD at *t-1* (before the crisis).

Independent and moderating variables

*CEO tenure and age***.** Tenure was obtained by directly asking for the number of years the manager has worked at the company as a CEO. Age was obtained by directly asking respondents using the following scale: 1=less than 20 years old, 2=between 21 and 30, 3=between 31 and 40, 4=between 41 and 50; 5=between 51 and 60; and 6=61 or more.

*TMT tenure and age diversity***.** *TMT tenure* and *age diversity* was gauged using the coefficient of variation of the team members' firm tenures and ages (Allison, 1978). Higher numbers indicate greater diversity.

Control variables

To control for the possibility that differences in the predictor and criterion variables might lead to spurious relationships, industry, firm age, firm size, firm past performance, nature of the family firm management, TMT and CEO education, and TMT size were entered as covariates in the analysis. Each control variable is described and its use is justified in Appendix 2.

Analysis and Results.

Multiple regression analyses and simple slopes tests were used to assess the hypotheses of direct and moderating effects on ambidexterity dynamism (Aiken and West, 1991; Cohen and Cohen, 1983). To reduce multicollinearity problems, we used standardized variables for the evaluation of moderating effects.

Table 1 presents descriptive statistics for the variables included in the study and the correlations matrix, and Table 2 presents the regressions we used to test the hypotheses. In Table 2, the dependent variable is *dynamism of ambidexterity* ($CD_t - CD_{t-1}$,) in all models.

Insert table 1 about here

Insert table 2 about here

Model 1 introduces the control variables (adjusted R^2 = .08, and F is not significant). Model 2 introduces the direct effects of the CEO tenure and age measures (H1 and H2). Hypothesis 1 is not supported (β=.13, p>.1) while support was found for hypothesis 2 (β= –.28<0 and is significant). Despite the correlation between the two independent variables (r=.51), this model does not have problems of multicollinearity (maximum VIF=1.73<10), and it considerably improves the R^2 compared to Model 1 (ΔF=2.36, p<.10). Model 3 introduces the moderating variable linear effects (TMT tenure and age) for control covariation. As expected, the linear effects are not significant. To control for two-way

interactions, Model 4 introduces the five interaction terms between CEO and TMT characteristics. None of these interactions are significant. Model 5 adds the first three-way interaction to the previous model, which corresponds to hypothesis 3. This model has a significantly improved explanatory model with regard to Model 4, raising the adjusted R^2 to .12 (ΔF=2.86, p<.05). The parameter associated with the three-way interaction differs significantly from zero and is positive (β=.35; p<.05), which can be interpreted as providing support for hypothesis 3. Model 6 repeats the analysis carried out in Model 5, but on the second three-way interaction term, which is used to test hypothesis 4. The overall fit indicators in this model are not as good as those in Model 4 and the parameter associated with the three-way interaction is not significant, which implies that hypothesis 4 cannot be supported according to our data. Finally, Model 7 introduces both three-way moderation terms, with similar results to those produced by Models 5 and 6.

Discussion and Conclusions

Our study contributes to the literature on ambidexterity and the upper echelons (Lubatkin *et al.* 2006; Cao *et al.* 2010; Tushman *et al.* 2011) by examining the combined impact of the CEO and the TMT on ambidexterity dynamism. Based on the idea that ambidexterity is a dynamic capability (O'Reilly and Tushman, 2008; 2011), we built and tested a model, which suggested that the manager's ability to sense changes in the environment, seize opportunities and threats, and reconfigure the firm's ambidextrous orientation depends upon the characteristics of upper echelons in terms of age and tenure. Through this model, our study helps to expand on and demonstrate the influence of the CEO, as well as his/her combined influence with the other TMT members in shaping the firm's ambidextrous orientation. Survey data from multiple respondents in 91 SMEs provide general support for this joint modeling of the CEO and the TMT effects on ambidexterity dynamism. Survey data from multiple respondents in 91 SMEs provide general support for this joint modeling of the CEO and the TMT effects on ambidexterity dynamism.

Based on upper echelons theory, we argue that tenure and age are related to Teece´s dynamic capabilities tripartite taxonomy of sensing, seizing and reconfiguring (Teece, 2007). Both factors are related to the ability of the upper echelons to process information (the ability to sense), looking for alternatives and making decisions regarding strategic change that imply different levels of risk-taking (enabling managers to seize) (McClelland *et al.* 2011; Simsek, 2007).

We argue that both CEO tenure and age are negatively related to changes in the ambidexterity orientation that are necessary for adapting the firm's strategy to changes in the environment. This negative relation diminishes when there is diversity in age and tenure between the members of the TMT.

Confirming our main expectations, we found that CEO age is associated with the firm's ambidextrous dynamism. This finding supports the line of research that sees the CEO's role in managing the paradox, tensions and contradictions of ambidexterity as vital (Tushman *et al*. 2011; O'Reilly and Tushman, 2011).

Surprisingly, and contrary to our expectations, we did not find a negative effect between CEO tenure and ambidexterity dynamism. Long tenured CEOs are not less able to react under sizeable, deep-rooted fast changes to the environment. This finding, while unexpected, is coherent with the results of the study by Simsek (2007). He finds that long tenured CEOs are less risk-adverse and implement more changes in the strategy orientation of the firm. Strategic changes are in line with dynamic capabilities, which imply reconfiguration.

He explains that this positive effect could be the result of the fact that tenured CEOs have developed networks with stakeholders for supporting change and risky initiatives. They are still in their position because they accumulate a track record; they have a deeper knowledge of the environment and have developed industry and firm knowledge. Musteen *et al.* (2010) find that CEO tenure has a positive effect on the relationship between the attitude towards change and the approach to innovation. They explain that tenured CEOs accumulate specific knowledge on the organization and they are able to influence and communicate their intentions more effectively, enabling organizational change.

Prior research has extensively focused on the dark side of long tenured upper echelons. It has linked tenure to commitment to the status quo (McClelland *et al.* 2010), with a negative attitude towards change (Finkelstein and Hambrick, 1990; Musteen *et al.* 2006) and to an increased risk-aversion (Finkelstein and Hambrick, 1990), making it difficult to seize and reconfigure. It has also linked tenure to restrictions on information processing (Finkelstein *et al.* 2009; Finkelstein and Hambrick, 1990) and increased strategic myopia (Schein, 1985), thereby impeding sensitivity to the environment. However, our study does not confirm this dark side and suggest that may be there is a bright side to tenure. However, our study does not confirm this dark side and suggest, but not support, that may be there is a bright side to tenure. This other side sees tenured CEOs as manager who have the power and the relationships they need to seize and reconfigure (Finkelstein *et al.* 2009). It argues that CEOs have a long tenure because they have been successful which, added to their extensive knowledge of industry and firm, gives them a clear power for decision-making (Simsek, 2007).

We found support for the negative relationship between CEO age and ambidexterity dynamism. Mature CEOs are near retirement, so we can expect them to feel contrary to changes in the reconfiguration of their resources, as this implies a degree of risk-taking that is difficult to assume at the end of their careers, and which will yield results in the long-term. This finding is in line with the classical study of Hambrick and Mason (1984) and others (MacCrimmon and Wehrung, 1990; McClelland *et al.* 2010; Wiersema and Bantel, 1992; Matta and Beamish, 2008) that defend the idea that older executives tend to be risk-averse because they have shorter career horizons in which to recoup losses. It also reinforces the results reported by McClelland *et al.* (2010) in the sense that *CEO age* is negatively associated with the attitude towards change and, in our case, with the ability to seize and reconfigure, changing the firm's ambidexterity orientation.

Our findings also lend support to studies that differentiate age and tenure as two demographic variables that, while highly correlated, are related to different cognitive processes (Musteen *et al.* 2006; McClelland *et al.* 2010; 2011). They share certain cognitive processes, but while age is linked to the idea of career horizons and their impact on decision-making, this is not the case for tenure.

In accordance with upper echelons literature, our results suggest that organizational outcomes will be better explained if we take into account the joint effect of CEO and TMT characteristics (Nielsen, 2010; Papadakis and Barwise, 2002). In our study, the effects of interaction increase the explanatory power of the model. This finding is along the same lines as the proposals of Simsek (2007) for analyzing risk-taking choices, as well as studies that take into account the combined effect of CEO-TMT networks on ambidexterity (Cao *et al.* 2010). These findings also have implications for general upper echelons research, providing new evidence on the importance of combining the effects of the CEO and the TMT (Cao *et al*. 2010; Nielsen, 2010). Upper echelons research has largely focused either on the CEO or on the TMT. We support the argument presented by Cao *et al*. (2010) that highlights the essential

role of the CEO in the firm's strategy formation, while recognizing his/her impact combined with that of other TMT members.

Specifically, our findings suggest that the joint interaction between tenured CEOs and TMT members of different tenures and ages is significantly related to ambidexterity dynamism. This outcome reinforces the role of TMT configuration in this relation, as the direct individual impact of these variables (TMT tenure and age diversity) on ambidexterity dynamism has not proven to be significant. Long tenured CEOs seem to benefit from the richness that the diversity in experience and age of his/her team brings to the firm when they have to focus on strategic change. Tenure is linked to a comprehensive decision process (Miller *et al.* 1998) and to behavioral integration (Simsek *et al.* 2005); it implies that experienced CEOs are able to benefit from a decision process characterized by brainstorming sessions, a number of considered alternatives and a level of analysis that can be enriched by less experienced TMT members that bring their ideas and more risk-taking initiatives to the table. This result also reinforces Simsek (2007) finding that CEO tenure is positively related to the assumption of risk by the members of the TMT and with the behavioral integration of the firm's decision making.

However, we did not find support for the three-way interaction between TMT diversity (in age and tenure) and CEO age. The explanation in the absence of confirmation possibly lies in our data. Our sample is made up of fairly homogeneous CEOs in terms of age. The variable of CEO age presents a variation coefficient which is three times smaller tan the variable of CEO tenure. Such scant variability means that the term that expresses the three-way interaction is highly correlated with the term that expresses the dual interaction between TMT age and tenure diversity, which makes it difficult for the former to be significant when competing with the latter in Models 6 and 7. Despite this explanation, this outcome casts doubt upon the ability of older CEOs to Foster and implement changes in firm ambidexterity.

This study reinforces the view of ambidexterity expressed in the literature as a dynamic process that allows firms to succeed both in the short and long term. Upper echelons characteristics appear as an antecedent of the ability of SMEs to adapt in a complex, changing environment. In addition, our results show that CEOs in SMEs play a key role in explaining the change in ambidexterity orientation. This finding is interesting because it provides empirical evidence that managers are important internal factors that affect dynamic capabilities (Ambrosini and Bowman, 2009).

Another contribution to the dynamic capability literature is to extend the range of specific dynamic capabilities considered in the literature by conceptualizing and implementing ambidexterity as a dynamic capability, in line with the proposal of O'Reilly and Tushman (2008). Furthermore, we prove that characteristics of the environment (uncertainty, complexity and munificence which occur in the crisis environment) influence the development of dynamic capabilities (Aragón-Correa and Sharma, 2003).

The findings of this study are subject to limitations, some of which suggest new lines of research. Firstly, our sample is made up of firms in mature industries, and thus some of the potential relationships between the joint effects of demographics on ambidexterity dynamism may be different for emerging industries, such as high tech ones. Hence, a future line of research could be to prove these effects in different types of industries. Secondly, more studies would be welcomed on the measurement of dynamism in ambidexterity due to the fact that it has been used exclusively as a static measure. Thirdly, our study is limited by retrospective bias as, although we attempted to reduce it by making a set of different

questions that make it easier for the respondent to focus on the past (Pearson, Ross and Dawes, 1994), the bias could remain in their answers. Finally, TMT diversity could be measured using additional variables as gender, functional background, education, etc, which are not controlled for in this study. Future studies could prove the effects we propose by measuring TMT diversity with other relevant variables.

However, despite these limitations, this study provides several practical implications for managers. We would like to emphasize that the interaction of tenure and age diversity in the management team and CEOs with long tenures, leads the firm to be more proactive in its strategic direction changes, thus making it more flexible to environmental turbulence, which increases their chances of survival in adverse conditions, particularly when the CEO has a long tenure.

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Appendix 1.

The process of refining the scales of exploitation and exploration has removed 4 of the items from the former scale, and 3 items from the latter scale. We applied a confirmatory factor analysis (CFA) in order to assess the validity of the exploration and exploitation scales for the two moments in time considered: t = during the crisis (since 2007), t-1 = before the crisis (2000-2007). The existence of two time periods introduces lagged variables into the model, and thus estimations were made following indications in the literature for "dynamic factor analysis" (Schumacker and Lomax, 2006). The data fit the model satisfactorily (X^2 = 45.78, df = 44, p<. 40; AGFI=0.88, CFI = 0.99; RMSEA = 0.02) and all the items are significant (p<.001), which guarantees the convergent validity of the measurement tool (Fornell and Larker, 1981). We also assessed discriminant validity. The Chi-squared differences test for the constructs of exploration and exploitation related in pairs shows that, in each case, the Chi-square in the model with the covariance restriction to the unit was significantly greater than the Chi-square of the model without the restriction, which suggests a satisfactory level of discriminant validity (Anderson and Gerbing, 1988). On the basis of these results, we can conclude that the scales used in the study provide sufficient evidence of reliability and convergent and discriminant validity. Table 3 shows the constructs and their items.

Insert table 3 about here

To overcome the self-serving bias problem, within the limitations imposed by the survey, we followed the recommendation of Pearson *et al.* (1994) to avoid the Recall bias, using CEO responses to evaluate the pre-crisis period, and the manager of the TMT responses to evaluate the during-crisis period. This solution does not solve the problem of retrospective bias, but it improves the reliability of the measures to avoid forcing the same individual to judge the past and present.

Appendix 2.

Ambidexterity literature usually controls for the effects of the *industry* for its influence on business strategies (e.g. Beckman, 2006). We included 5 industry dummies at the 2-digit level of NACE Rev 2 classification to control for 6 industries in our sample (NACEs 16, 20, 23, 24, 28, and 31). *Firm size* has been argued to affect the relationship between executive characteristics and organizational outcomes (Miller, 1991) and previous research has indicated that size is associated with opposing impacts on exploration and exploitation (Rothaermel and Deeds, 2004). Therefore, firm size was included as a control variable and was measured as the natural log of total employees. We controlled for *firm age* as it has been found to influence firm growth orientation (Carroll and Hannan, 2000). Age was calculated by using a measure calibrated in years. In order to control for relative *past firm performance* (relative to that of other major competitors), we used a measure which included 3 items: growth in sales, growth in market share, and returns, rated using a scale from 1 (much worse than competitors) to 5 (much better than competitors). The measure demonstrated good reliability (Cronbach alpha = .89) and it is used in the regression analysis by a sum scale. We controlled for family management and ownership, because SMEs are more likely to be "family firms" and, consequently, biased by the founding family (Lubatkin *et al.* 2006). We

used a measure that included 3 items: family ownership control (0=no, 1=yes), there are a large number of family members in TMT (0=no, 1=yes); the CEO is a family member (0=no, 1=yes). The measure demonstrated good reliability (Cronbach alpha = .93) and it is used in the regression analysis by a sum scale. Three TMT and CEO demographic variables were included as controls. According to Carpenter (2002), measures of TMT diversity are size-dependent (i.e., larger TMT can be more diverse by definition). Therefore, in our study, TMT size was controlled and measured as the total number of executives on the team. On the other hand, TMT education has been positively related to innovation and strategic change (Wiersema and Bantel, 1992). Thus, TMT education was controlled and calculated as the percentage of team members with at least a bachelor degree. Finally, Finkelstein and Hambrick (1996) have shown that CEO education has a significantly positive correlation with technological innovation and strategic change. We control for this variable, measured using a 5-point scale where 1=high school diploma or below; 2= associate degree; 3=bachelor degree; 4=masters degree; and 5=Ph.D.

Table 1. Descriptive statistics: means, standard deviations and correlations.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Ambidexterity dynamism	-1.22	5.37																
2. Industry (dummy 1)	0.16	0.37	-0.14 †															
3. Industry (dummy 2)	0.26	0.44	0.04	-0.27 **														
4. Industry (dummy 3)	0.12	0.33	0.22 *	-0.16 †	-0.22 *													
5. Industry (dummy 4)	0.05	0.23	0.15 †	-0.11	-0.14 †	-0.09												
6. Industry (dummy 5)	0.05	0.23	-0.22 *	-0.11	-0.14 †	-0.09	-0.06											
7. Firm size (ln employee)	3.57	0.75	0.05	0.08	0.15 †	0.06	-0.08	-0.05										
8. Firm age (years)	31.07	18.91	0.01	0.03	-0.17 †	-0.10	-0.05	-0.03	0.07									
9. Firm past performance	3.07	0.94	0.14 †	0.11	0.17 †	-0.08	0.01	-0.20 *	0.17 †	-0.05								
10. Family ownership	2.26	1.12	-0.04	0.11	-0.15 †	-0.01	0.16 †	-0.21 *	-0.25 **	0.23 *	-0.10							
11. TMT size	3.52	1.37	-0.03	0.16 †	0.06	0.00	-0.09	0.14 †	0.49 ***	-0.02	0.05	-0.17 †						
12. TMT education	47.16	33.21	0.17 †	-0.01	0.11	0.00	-0.19 *	0.05	0.43 ***	0.06	0.11	-0.13	0.30 **					
13. CEO education	1.92	1.04	0.09	-0.02	0.14 †	-0.07	-0.12	0.02	0.40 ***	-0.05	0.25 **	-0.16 †	0.33 ***	0.53 ***				
14. CEO tenure	14.89	11.08	-0.06	0.11	-0.15 †	0.02	0.03	0.19 *	-0.14 †	0.17 †	-0.15 †	0.05	-0.15 †	-0.15 †	-0.30 **			
15. CEO age	4.10	1.09	-0.22 *	0.21 *	-0.05	-0.03	-0.07	-0.02	-0.18 *	0.20 *	-0.20 *	-0.02	-0.19 *	-0.13	-0.31 **	0.51 ***		
16. TMT tenure diversity	0.42	0.33	0.14 †	0.21 *	-0.11	0.03	0.04	-0.01	0.33 ***	0.14 †	0.16 †	-0.12	0.60 ***	0.35 ***	0.13	-0.15 †	-0.21 *	
17. TMT age diversity	0.25	0.18	-0.02	0.09	0.04	0.06	-0.09	0.04	0.22 *	-0.08	0.12	0.05	0.46 ***	0.11	0.00	-0.12	-0.24 *	0.50 ***

† $p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

Table 2. Results of Regression Analyses.

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
Variable	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
(Constant)														
Industry (dummy 1)	-0.08		-0.02		-0.04		0.00		-0.01		-0.01		-0.02	
Industry (dummy 2)	0.05		0.08		0.09		0.11		0.07		0.11		0.06	
Industry (dummy 3)	0.24	*	0.24	*	0.24	*	0.20	†	0.16		0.20	†	0.16	
Industry (dummy 4)	0.22	†	0.21		0.18		0.19		0.24	*	0.18		0.21	†
Industry (dummy 5)	-0.20	†	-0.24	*	-0.23	†	-0.23	†	-0.30	*	-0.23	†	-0.31	*
Firm size	-0.10		-0.14		-0.12		-0.13		-0.13		-0.13		-0.14	
Firm age	0.07		0.11		0.08		0.03		0.08		0.03		0.07	
Firm past performance	0.10		0.05		0.05		0.03		-0.03		0.04		-0.01	
Family ownership	-0.10		-0.15		-0.13		-0.13		-0.21		-0.13		-0.20	
TMT size	-0.01		-0.04		-0.07		-0.05		-0.04		-0.05		-0.03	
TMT education	0.23	†	0.25	†	0.21		0.25	†	0.24	†	0.25	†	0.23	†
CEO education	0.01		-0.02		-0.01		-0.07		-0.07		-0.07		-0.07	
CEO tenure			0.13		0.14		0.16		-0.04		0.17		-0.04	
CEO age			-0.28	*	-0.27	*	-0.30	*	-0.35	*	-0.28	†	-0.29	†
TMT tenure diversity					0.12		0.13		0.08		0.13		0.06	
TMT age diversity					-0.07		-0.08		-0.01		-0.09		-0.03	
CEO tenure x TMT tenure diversity							0.01		-0.08		0.01		-0.10	
CEO tenure x TMT age diversity							-0.07		-0.01		-0.07		0.01	
CEO age x TMT tenure diversity							-0.09		-0.04		-0.10		-0.07	
CEO age x TMT age diversity							-0.03		0.02		-0.04		0.00	
TMT tenure diversity x TMT age diversity							0.11		0.17		0.11		0.19	
CEO tenure x TMT age diversity x TMT tenure diversity									0.35	*			0.42	*
CEO age x TMT age diversity x TMT tenure diversity											-0.04		-0.17	
R^2	0.20		0.25		0.25		0.29		0.33		0.29		0.35	
Adjusted R^2	0.08		0.11		0.09		0.07		0.12		0.06		0.12	
ΔF	1.63	†	2.36	†	0.33		0.65		4.78	*	0.08		3.02	†
VIF max	1.71		1.73		2.52		2.78		2.86		2.79		3.01	

Note. Standardized coefficients shown. † $p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

Table 3: Confirmatory factor analysis of multi-item scales.

Construct	Standardized factor loading	p-value
Exploration during the crisis (alpha=.82)		
Item 1	.78	
Item 2	.76	***
Item 4	.74	***
Exploration before the crisis (alpha=.82)		
Item 1	.89	
Item 2	.80	***
Item 4	.67	***
Exploitation during the crisis (alpha=.66)		
Item 3	.59	
Item 5	.60	***
Item 6	.70	***
Exploitation before the crisis (alpha=.80)		
Item 1	.73	
Item 3	.79	***
Item 4	.74	***

***$p < .001$.

[1]SABI/Amadeus is an on-line database compiled by the Bureau Van Dick. The sampled companies are located in Valencia and Castellón (Spain). The activities of firms in the study fall within NACEs (Rev. 2) 16, 20, 23, 24, 28, and 31. Firms are neither subsidiaries nor strategic business units of other firms.