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# Owners' preferences for CEOs characteristics: did the world change after the global financial crisis?

Chiara Mio, Marco Fasan and Antonio Ros

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**Abstract**

**Purpose** – *The purpose of this paper is to study whether and how owners' preferences for CEO characteristics changed due to the 2008-2009 global financial crisis. The authors identify three fundamental success factors needed for companies to compete in the after-crisis environment, and the authors connect five CEO characteristics to such factors.*

**Design/methodology/approach** – *The authors rely on a hand-collected database to build a panel data of European CEOs for the 2010-2012 period.*

**Findings** – *The empirical results indicate that after 2009, CEOs of companies that were more severely hit by the crisis are significantly different compared to those of other companies. More specifically, they have a background in science or engineering; they have international experience; and they are remunerated to a higher extent through stock options. The results of this paper also indicate that only international experience had a positive and significant impact on financial performance.*

**Originality/value** – *The paper contributes to the stream of literature on CEO characteristics and owners' identity, tackling the research theme from a dynamic rather than from a static perspective.*

**Keywords** *Corporate governance, Board of directors, Chief executives*

**Paper type** *Research paper*

## 1. Introduction

The 2008-2009 global financial crisis had major consequences not only on the economic environment but also on the corporate governance of firms, especially in terms of top executives turnover. Richard Kovacevich left Wells Fargo as Chairman in December 2009; John Mack left Morgan Stanley (MS) in January 2010; and Ronald Logue left State Street Bank in March 2010 (see CNN, 2012). This anecdotal evidence is consistent with the prediction by Jenter and Kanaan (2006): in periods of crisis, the likelihood for CEOs of being fired is significantly higher as compared to more stable period.

This paper studies such changes in governance, analyzing whether and how the global financial crisis shaped owners' preferences toward the characteristics of their CEOs. More specifically, this work has two main objectives. First, understanding the direction of these changes in governance and identifying which CEO characteristics owners believed being more important for the future performance of their companies in the post-crisis environment. Second, testing the impact of these CEO characteristics on the financial performance of firms after the crisis, thus identifying which CEO characteristics have been actually beneficial in terms of financial performance.

Our work belongs to the CEO characteristics literature, and it combines two different theories: the owner identity theory and the upper echelons theory.

The owner identity theory predicts that different types of owners will determine different top management and board characteristics (Thomsen and Pedersen, 1997, 2000; Pedersen and Thomsen, 2003).

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According to the upper echelons theory, organizational outcomes (strategic choices and organizational outcomes) are partially predicted by managerial background characteristics. Such theory has been subsequently extended by other studies such as the study conducted by Bolton *et al.* (2008), which developed a theory of leadership that contrasts managerial resoluteness against communication and listening skills. Numerous empirical studies tried to understand how CEO characteristics shaped company strategy and performance. According to March and Simon (1958), Hambrick and Snow (1977) and Hambrick and Mason (1984), personality and professional features determine the effectiveness and efficiency of the CEO in the performance of his/her duties. The general construct of CEO characteristics includes both the personality of the subject (personality features) and other features that are more related to the working life of the CEO (professional features).

Hambrick and Mason (1984) identified a number of observable characteristics of the CEO, such as age, functional orientation, experiences, formal education, culture, socio-economic features and the degree of heterogeneity of the group management. Many authors have subsequently developed and integrated this list with additional specifications and new features. One may conclude that the most important CEO characteristics are age (Child, 1974), gender (Jalbert *et al.*, 2013), personality (Kaplan *et al.*, 2008), type and level of education (Martelli and Abels, 2010; Lewis *et al.*, 2014), marital status (Roussanov and Savor, 2012), propensity to adopt innovations (Thong and Yap, 1995), problem-solving methodology (Jung, 1970), functional orientation and diversity (Hambrick and Mason, 1984; Buyl *et al.*, 2011), leadership style (Halal, 1974), power (Adams *et al.*, 2005), being the founder of the company, tenure (Rajagopalan and Datta, 1996), international experience (Roth, 1995) and compensation (Murphy, 1998).

With specific regard to the relationship being tested, Boyd (1995) examined the relationship between CEO duality and firm performance. Rajagopalan and Datta (1996) have investigated the association between certain characteristics of the CEO, such as the length of tenure, level of education and functional orientation, and the peculiarities of the sector in which the company operates, trying to understand which entities are best suited to manage a company in a particular sector. Given the central role played by agency theory in the analysis of the relationship under study, Carpenter and Sanders (2002) dealt with the analysis of the remuneration of the CEO (and top management) and corporate performance. CEOs are ultimately responsible for managing an important variable, which is the level of investments in CSR. Huang (2013) focused on the impact of CEO characteristics on corporate sustainable development, finding that CSR is associated with their CEOs' educational specializations, tenure and gender. With specific regard to corporate governance, Lin *et al.* (2014) examined the relationship between CEO characteristics and internal control quality. The study by Yunlu and Murphy (2012) shares some features with ours, because it focuses on the recession period. The authors found that during recession, CEOs with a shorter career horizon decreased R&D, spending more dramatically than CEOs with a longer career horizon during recession. Saeed *et al.* (2015) found that CEO tenure and CEOs with financial expertise are reported to be associated with timely audit reports, while Zhou and Yonghai (2014) found that CEO characteristics affect corporate risk-taking. Finally, Matolcsy and Wright (2011) have attempted to define the characteristics of a remuneration structure that brings positive results to the performance of the company.

This analysis of the previous literature shows that none of the studies above tackled the research theme from a dynamic perspective, thus looking at the changes in CEO characteristics over time which were due to specific events.

To frame our hypotheses, we argue that the global financial crisis highlighted three critical success factors that companies are expected to possess to successfully compete in the post-crisis environment:

1. sustainability orientation;
2. aptitude towards internationalization and change; and
3. minimization of the agency conflicts.

By relying on previous studies, we show that each of these factors is connected to some specific CEO characteristics. For instance, female CEOs are more likely to foster sustainability, and younger CEOs are more likely to be prone to change. Thus, we hypothesize that the shareholder preferences for CEO characteristics in companies most severely hit by the crisis are significantly different as compared to low-crisis-impact companies. In particular, we expect high-crisis-impact companies to prefer CEOs having characteristics that are more in line with the post-crisis success factors.

Our empirical results indicate that after the crisis, CEOs of high-crisis-impact companies are significantly different when compared to other CEOs. More specifically, they have a background in science or engineering; they have international experience; and they are remunerated to a higher extent through stock options. This is consistent with the argument that after the crisis, owners have been looking for these characteristics in choosing their CEOs. Our results also indicate that only international experience had a positive and significant impact on financial performance.

The present article provides a relevant contribution to current literature because of three main reasons. First, it extends and merges the CEO characteristics (Hambrick and Mason, 1984) and the owners' identity literature (Thomsen and Pedersen, 1997, 2000; Pedersen and Thomsen, 2003). It does so in a dynamic perspective, thus looking at the changes in CEO characteristics due to a specific event (the global financial crisis), rather than looking at such relationships in a static perspective. This is important because it allows extending owners' identity theory predictions: our results suggest that owners do not only determine the characteristics of new CEOs. Rather, they also have expectations about the success factors and CEO characteristics that the company will need to be successful. Given these elements, they will determine the new CEO accordingly.

Second, our results may be of interest to investors, policy-makers and universities or teaching institutions. Investors may be interested in understanding whether the profile of the CEO of a certain company they are considering investing in is consistent with the success factors that are required to be successful in the future. Universities may consider revising their teaching courses to include courses providing students with skills that investors consider to be relevant in the future environment.

Third, our paper focuses also on the Continental European setting, which has often been overlooked by previous literature, probably because of the lack of empirical data. We rely on a unique hand-collected database on CEO characteristics, which allows us to draw unique conclusions.

The rest of the paper is organized as follows. Section 2 identifies the post-crisis success factors and CEO characteristics, and it develops our hypotheses. Section 3 describes our empirical strategy through which we test our hypotheses. Section 4 displays and discusses the empirical results. Finally, Section 6 concludes.

## 2. Hypotheses development

This section frames our hypothesis, and it is divided into three paragraphs. In the first, we show that the global financial crisis highlighted three critical success factors that companies need to possess to successfully compete in the post-crisis environment: sustainable approach, aptitude toward internationalization and change and minimization of the agency conflicts. These factors lead to the necessity of selecting CEOs with specific characteristics. In the second paragraph, we dig deeper and we propose five different CEO characteristics that previous studies showed to be connected with the success

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factors. Finally, in the third paragraph, we connect such CEO characteristics with the financial performance of companies after the crisis.

While most of the previous literature focused on the Anglo-Saxon context, our work includes also Continental European (namely: France and Germany) countries. Studies on CEO characteristics are tightly linked to the agency problem, which has a very different nature in the two contexts. In firms characterized by concentrated ownership, in particular family firms, which are typical of Continental Europe, the agency conflict is not between managers and owners (as in classic agency theory), but rather between majority and minority shareholders (Shleifer and Vishny, 1986; La Porta *et al.*, 1999). Besides, well-developed capital market with widely dispersed shares, typical of the Anglo-Saxon contexts, limits the influence of banks, which have instead a more prominent role in Continental Europe. Therefore, because of these corporate governance and agency differences, it is important to include both contexts in the analysis.

### *2.1 The impact of the financial crisis on owners' preferences for CEO characteristics*

The financial crisis represented one of the events that more radically changed the business environment over the past decade. Many articles have been written on the causes and consequences of the crisis, both from an economic, management and policy-making perspective. We argue that the financial crisis highlighted three critical success factors that companies needed to possess to successfully compete in the post-crisis environment.

The first factor is the sustainable approach. The global financial crisis conferred a central importance to the issue of ethics (Mio and Fasan, 2011). Greed, bad regulation in the financial sector and the lack of transparency have been pointed out as the main causes of the financial crisis. Relying on Factiva, we observed that during 2008, the word "greed" has been used in 31,582 press articles, whereas three years before, it has been used just in 18,744 articles. The words "financial regulation" have been used 7,219 times in 2008 and 1,931 times in 2005. The word "transparency" has been used 137,446 times in 2008 and 85,090 times in 2005. The argument that the lack of ethics is one of the (perceived) causes of the financial crisis also finds support in public statements of prominent world leaders. In July 2008, the President of the USA, George W. Bush – during a closed Republican fundraiser – declared: "Wall Street got drunk" (New York Times, 2008). On September 23, 2008, the French President Nicolas Sarkozy, addressing to the United Nations general assembly, said that the world cannot wait to "bring ethics to financial capitalism" (The Economist, 2008).

The second factor is the aptitude toward internationalization and change. The financial crisis made the interconnectedness of the world markets evident, indicating that companies need to be able to operate in a global environment to create value. The crisis spread quickly from the USA to the rest of the world. After the Lehman Brothers' bankruptcy, the industrial production in Europe decreased significantly, both in 2008 and 2009. The gross domestic product (GDP) of the emerging countries (such as China, India and Brazil) also decreased, as compared to the pre-crisis levels. In Latin America, the financial crisis slowed the growth down in terms of GDP: while these countries were growing by 5.8 per cent in 2007, in 2008, the GDP growth was only of 4.6 per cent. China was growing at a pace of 13 per cent per year, while after the crisis, the growth slowed down at 9 per cent, mainly due to a decrease in export. In general, the crisis, which started in the USA, had global effects, which highlighted the interconnectedness of the world markets and the importance for companies to be able to operate in such an environment.

Similarly, in 2008, when the global financial crisis begun, it was clear that the global environment was going to change dramatically. The same etymology of the word "crisis" derives from Greek "krisis", which means "decision". Among other factors, the global financial crisis showed to the whole world the weaknesses of the financial sector, and indeed, after some months, the credit crunch started. This meant that companies had to change the ways in which they were financed. In other words, another important message



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of the crisis was that the economic environment was going to change, and that successful companies would need to be able to change accordingly.

The third factor is the minimization of the agency conflicts. The financial crisis showed the existence of severe agency problems between managers and owners. As recognized by Rose (2010), the crisis is regarded in some respects as a failure of corporate governance, mostly owing to managerial expropriation and high agency costs. Also, according to ACCA (2008), the lack of accountability within corporations and financial institutions and between directors and their principals was identified as a major failing in the realm of corporate governance. One of the reasons of the corporate governance failure during the crisis was the dilution of share ownership. The largest individual share ownerships amount to just a minor percentage of the total shareholding, and it is, therefore, not possible for these shareholders to exercise direct control of corporate management (Clarke, 2007). In the Northern Rock case, 144,000 of the 180,000 shareholders were found to be small investors, who did not have sufficient information or influence to exercise due diligence in monitoring the board's performance. This wide distribution of ownership has rendered Anglo-American shareholders, including institutional investors, passive in corporate governance (Wen and Zhao, 2010).

We argue that these signals the financial crisis gave to the market did shape the preferences of shareholders toward CEO characteristics. For instance, the importance of the international aptitude may have led shareholders to select CEOs that have more international experience. Similarly, the importance of the sustainable approach may have led owners to select a woman as the CEO, because women have been shown to be more sensible to sustainability issues.

We also argue that the signals of the financial crisis have been captured to a higher extent by shareholders of companies that were hit by the crisis harder. As a consequence, this change in owners' preferences has been stronger among "high crisis impact companies" (for an empirical definition of this construct, see section "Methodology"). Shareholders that saw the ability of their companies to produce value being jeopardized to a higher extent by the global financial crisis assimilated the crisis' messages more deeply, therefore modifying their preferences for CEO characteristics accordingly (for a discussion on the psychological mechanisms in the context of the financial crisis, see Montgomery, 2011).

We propose the following hypothesis:

*H1*. The global financial crisis changed owners' preferences for CEO characteristics.

### *2.2 Success factors and CEO characteristics*

Building on the three critical success factors identified in the previous paragraph, we now connect the CEO characteristics to each factor. Figure 1 shows the relationship between success factors and CEO characteristics.

*2.2.1 Sustainability orientation.* We argued that the financial crisis was perceived as being caused by a lack of ethics in the marketplace. One way for the companies that were more severely hit by the crisis to signal their ethical behavior (and, therefore, to gain stakeholders' and investors' support) is through hiring a female CEO.

Jalbert *et al.* (2013) found that female CEOs do not have any significant impact on financial performance, but that they significantly increase companies' social performance. This result is strengthened by the work of Bear *et al.* (2010), which argue that women are more inclined to consider the community, the environment, ethnic and religious minorities in corporate policies. Women also usually adopt a leadership style more participatory and democratic, and this fosters cooperation and communication. More recently, Huang (2013) empirically showed that CEO gender matters, in terms of CSR performance, as female CEOs are more likely to have higher levels of CSR.

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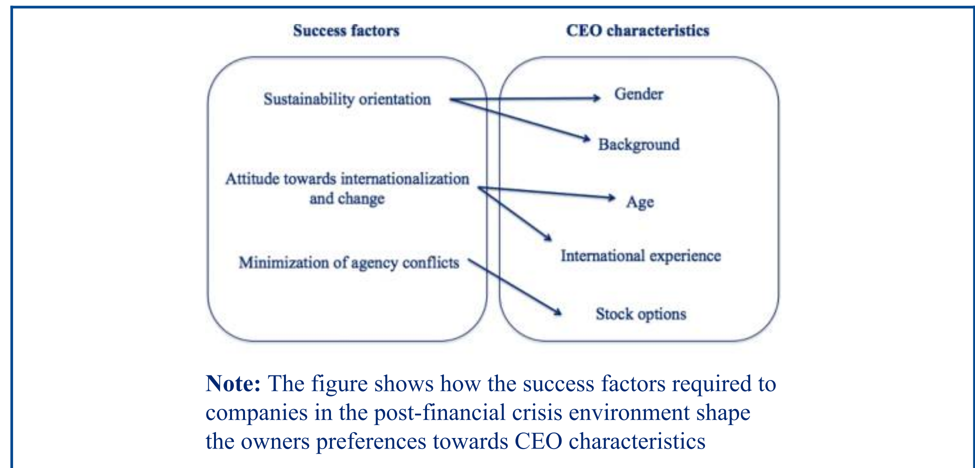
**Figure 1** Companies success factors and CEO characteristics




**Note:** The figure shows how the success factors required to companies in the post-financial crisis environment shape the owners preferences towards CEO characteristics

Therefore, we expect companies that were more severely hit by the crisis to hire women CEOs to be more aligned with the demand for ethics arising from the crisis. We propose the following hypothesis:

> *H2a*. Companies that were more severely hit by the crisis choose more often female CEOs.

We argue that the background (or education) of the CEO plays a relevant role in influencing the level of sustainability performance of the company. According to Huang (2013), firms' CSR ratings are influenced by CEO's educational specialization (MBA or MS degree).

We dig deeper into Huang's (2013) findings, and we focus on the typology of bachelor's degree or subsequent master's degrees earned by the CEO. In particular, we identify two CEO background categories: those with a background in arts, law and business and those with a background in science and engineering.

According to Frank *et al.* (1993), CEOs with a degree in humanities or social sciences are more likely to foster companies' social performance. Looking at a sample of US students attending the first year of University courses, Manner (2010) found that:

> After only one semester of microeconomics, students responded less ethically moral issues, and were less inclined to cooperate or to expect that the other students would cooperate in experiments based on the prisoner's dilemma with respect to the period prior to the start of the course (Manner, 2010).

Conversely, Davis *et al.* (1997) argued that the study of psychology and sociology influences the knowledge base of the subjects, making them more inclined to sacrifice personal interests for the fulfillment of the demands of others stakeholders.

Shareholders of high-crisis-impact companies may have developed a preference for CEOs that are able to foster the social performance of their companies through a better ability to develop relationship with stakeholders, relying on a more humanistic background.

We propose the following hypothesis:

> *H2b*. Companies that were more severely hit by the crisis choose more often CEOs with arts/law/business background and less often CEOs with a science/engineering background.

*2.2.2 Attitude toward internationalization and change.* As we argued in the previous paragraph, the financial crisis was perceived as bringing along an unavoidable significant

change in the business environment. The credit crunch that affected the world economy after the crisis required companies to be able to change their financing strategy. Also, the demand of consumers may have been expected to change towards more sustainable products, coherently with the need of ethics in the market place.

Previous studies have shown that younger CEOs are more prone to change. Barker and Mueller (2002) reported that, in general, younger CEOs tend to be more prone to the adoption of both product and process innovations and to changes to the strategies undertaken according to environmental conditions, showing a greater ability to adapt to the changing business environment. A young management is associated with organizational growth and with earnings and sales volatility (Child, 1974). This is because young executives are more prone to try new strategies and actions that were never undertaken in the past and to adopt new business solutions.

Conversely, older executives are to a larger extent averse to uncertainty. This may be due to a decline in physical and mental strength (Child, 1974), due to the reduced ability to seize new opportunities and learn new behaviors (Chown, 1960) or due to poorer ability to integrate large amounts of information in decision-making process (Taylor, 1975).

Therefore, the perspective change in the business environment may have led companies to choose younger CEOs, because of their better ability to manage change.

We propose the following hypothesis:

*H2c*. Companies that were more severely hit by the crisis choose more often younger CEOs.

As we argued above, the financial crisis highlighted the interconnectedness of the world markets. Previous studies found that CEOs with an international background are better at operating in international contexts. More specifically, according to Knickerbocker (1973) and Prahalad and Doz (1987), the fact that the organizations act in international competition puts them in front of a diverse and multi-faceted competition, which to be tackled effectively requires integration between the various components of the company. According to Roth (1995), the international experience of the CEO plays a significant role when the company's headquarters and the various organizational units located across national borders are interconnected. Hermann and Datta (2002) found that CEO's international experience is associated with full-control entry modes in the case of market entry events, thus suggesting a better ability to operate in international contexts.

The perspective change in the business environment toward a higher degree of internationalization may have led companies to choose CEOs with an international background. We propose the following hypothesis:

*H2d*. Companies that were more severely hit by the crisis choose more often CEOs with an international experience.

*2.2.3 Minimization of agency conflicts.* As we already argued above, the crisis showed the existence of a severe conflict of interest between managers and owners. In a sense, the financial crisis showed that the agency problem is still playing a central role, over 80 years after the work by Berle and Means. Short-term-oriented managers have constant incentives to maximize their performance in the short run, at the expense of the long-term performance of the company. Corporate governance systems (and in particular remunerations systems) need to constantly align interests of managers and owners to avoid short termism.

High-crisis-impact companies may have developed, after the crisis, remuneration systems that more closely try to align the interest of managers and owners, in particular through stock options. Agency theorists have long argued that CEOs need significant at-risk wealth in firm decisions to maximize shareholder wealth (Barker and Mueller, 2002). Substantial

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CEO stockholdings are one of the most commonly used methods of tying CEO wealth to that of shareholder' (see Jensen and Murphy, 1990 for a review).

We propose the following hypothesis:

*H2e*. Companies that were more severely hit by the crisis remunerate their top executives to a higher extent through stock options.

### *2.3 The impact of CEO characteristics on financial performance*

The last hypothesis of our study aims at testing the relationship between the CEO characteristics analyzed and financial performance after the crisis.

As it was already argued in the development of *H2a*, female CEOs may signal the sustainability of companies. Even if previous studies (Jalbert *et al*., 2013) do not find a positive relationship between the presence of a female CEO and the financial performance of a company, we intend to test such relationship. In fact, several studies showed that social performance and financial performance are positively and significantly related (Margolis *et al*., 2007). Beyond this, the analysis by Jalbert *et al*. (2013) has been conducted before the financial crisis, and the situation may have changed after the crisis, because of the most important role played by ethics.

We propose the following hypothesis:

*H3a*. Companies with female CEOs have better financial performance.

*H2b* relies on the literature examining the characteristics of the background of the CEOs, arguing in particular that CEOs with a more humanistic background will be better able to satisfy the need for ethics and to create tighter relationships with stakeholders (Frank *et al*., 1993 and Manner, 2010). Consistently, we expect CEOs with such a background to be able to create more value.

We propose the following hypothesis:

*H3b*. Companies with CEOs with a background in "arts/law/business" have better financial performance.

As it was already argued in the development of *H2c*, younger CEOs may be more prone to change and, therefore, able to change more rapidly the company toward the characteristics it needs to possess in the post-crisis environment.

We propose the following hypothesis:

*H3c*. Companies with younger CEOs have better financial performance.

Companies with CEOs having international experience will have higher financial performance, because they will more easily deal with the internationalization of financial and product markets.

We propose the following hypothesis:

*H3d*. Companies with CEOs with an international experience have better financial performance.

Finally, as it was already argued in the development of *H2e*, we expect companies with managers acting to a higher extent towards the interests of their stakeholders to have better financial performance. As we are not measuring the actual existence of the conflicts of interests, we rely on the remuneration through stock options, considering it to be a proxy for the alignment of interests between owners and managers.

We propose the following hypothesis:

*H3e*. Companies with CEOs that have high stock ownership have better financial performance.

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## 3. Methodology

### *3.1 Sample and data*

Our sample includes 112 randomly selected listed companies belonging to the following countries: Germany (11 companies), France (20 companies) and the UK (81 companies). We limited our analysis to the listed companies because of two main reasons. First, the financial crisis had an immediate impact on these companies (under the form of share price decline), and this allows us to conclude that the crisis affected all these companies simultaneously in 2008. While also non-listed companies have been affected by the financial crisis, such impact has been indirect and, therefore, more diluted over time. Second, listed companies are more homogeneous, and provide more information about their governance and CEO characteristics as compared to non-listed companies.

We hand-collected, for the 2010-2012 period, a number of variables about the characteristics of CEOs. These variables are not available in any database, and were entirely hand-collected, by relying on annual reports, Web sites and other publicly available information. These variables represent a unique data set that allows us to draw unique results in the European context, which has often been neglected because of the lack of data. The CEO characteristics are the following:

- *Female CEO (gender)*: A dummy variable that is 1 when the CEO of the company is a woman and 0 otherwise.
- *CEO age (age)*: A continuous variable indicating the age of the CEO as of the fiscal year end.
- *Science/engineering background*: A dummy variable that is set to 1 when the CEO graduated in science or engineering and 0 otherwise. We partially rely on the work by Manner (2010), which classify the bachelor's degrees in science/engineering and other background.
- *Arts/law/business background*: A dummy variable that is set to 1 when the CEO graduated in arts, law or business and 0 otherwise.
- *International experience*: A dummy variable which is set to 1 if the CEO did have any appointment in companies not belonging to the country of the company he/she is currently working for.
- *CEO stock ownership*: A continuous variable that represent the value (in Euros) of the common stock held by the CEO as of the fiscal year end.

Beyond these, we collected, for the whole 2005-2012 period, also data on the following variables by relying on the Bloomberg database: total salary of the CEO, total bonuses of the CEO, Tobin's Q and market capitalization.

Table I displays the main descriptive statistics for the variables used.

### *3.2 Empirical strategy*

To test *H1* and *H2*, we looked at the differences, in terms of CEO characteristics for the 2010-2012 period, between high- and low-crisis-impact companies. In other words, we test whether, after the financial crisis, companies that were hit harder by the crisis hire CEOs with characteristics that are significantly different as compared to those of CEO of companies that were hit by the crisis to a lesser extent (low-crisis-impact companies).

To divide our sample between high- and low-crisis-impact companies, we looked at the average stock price of the companies before the crisis (2006-2007) and after the crisis (2008-2009). By comparing these two values, we obtained a percentage decrease/increase of the value of the stock price of each company that allowed us dividing the sample in two parts. More specifically, we used the median of these changes to evenly split our sample in high-crisis-impact companies (the 61 sample companies with the lowest



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| Table I Descriptive statistics for variables used in the analysis | | | | | | |
|---|---|---|---|---|---|---|
| *Variable* | *N* | *Mean* | *Median* | *SD* | *Minimum* | *Maximum* |
| Female CEO | 356 | 0.044 | 0 | 0.20 | 0 | 1 |
| CEO age | 336 | 53.19 | 53 | 5.79 | 38 | 77 |
| Science/engineering background | 321 | 0.44 | 0 | 0.49 | 0 | 1 |
| Arts/law/business background | 321 | 0.74 | 1 | 0.43 | 0 | 1 |
| International experience | 336 | 0.84 | 1 | 0.36 | 0 | 1 |
| Total salary | 582 | 868,407 | 825,105 | 366,255 | 212,005 | 1,712,800 |
| Total bonuses | 573 | 920,001 | 788,039 | 651,107 | 0 | 2,791,420 |
| CEO stock ownership | 299 | 5,673,641 | 253,042 | 34,101,870 | 0 | 32,230,440 |
| Stock return | 873 | 0.164 | 0.131 | 0.515 | −0.948 | 5.201 |
| Tobin's Q | 867 | 1.787 | 1.458 | 1.100 | 0.467 | 9.674 |
| Market capitalization | 870 | 15,298 | 4,410 | 28,292 | 424 | 182,245 |

**Notes:** This table reports descriptive statistics for the variables used in our analyses. We report the mean, median, standard deviation and minimum/maximum values for the following variables: *Female CEO*, a dummy variable which is 1 when the CEO of the company is a woman and 0 otherwise; *CEO age*, the age of the CEO; *Science/engineering background*, a dummy variable that is set to 1 when the CEO graduated in science or engineering and 0 otherwise; *Arts/law/business background*, a dummy variable that is set to 1 when the CEO graduated in arts, law or business and 0 otherwise; *International experience*, a dummy variable which is set to 1 if the CEO did have any appointment in companies not belonging to the country of the company he/she is currently working for; *Total salary; total bonuses; CEO stock ownership; stock return; Tobin's Q; market capitalizaion*

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change in stock price before and after the crisis) and low-crisis-impact companies (the 61 sample companies with the higher change in stock price before and after the crisis). In other words, high-crisis-impact companies saw their stock price decreasing the most during the crisis.

By relying on this classification, we performed both an univariate analysis (comparing CEO characteristics of high- and low-crisis-impact companies through *t*-test and Wilcoxon text) and an OLS regression model, where the dependent variable is CEO characteristic; the main independent variable is "High crisis impact", which is a dummy variable equal to 1 for high-crisis-impact companies and equal to 0 otherwise; the control variables are market capitalization, Tobin's Q, return on equity, country and industry:

$$CEOcharacteristic = \alpha + \beta_1 HighCrisis\ Impact + \beta_2 MrkCap + \beta_3 TobinQ + \beta_4 ROE + \beta_5 Country + \beta_6 Industry + \varepsilon$$

To make our results more robust, we utilized the same classification (high- and low-crisis-impact) to see if we found any difference in CEO characteristics before the crisis. Clearly, given that before the crisis such classification did not have any meaning, we expect not to find any significant difference between the two groups.

To test our third hypothesis, we performed a panel data regression with fixed effect and a simple OLS regression. In both models, the dependent variable, measuring financial performance, is Tobin's Q. We selected this variable consistently with previous studies (Adams *et al.*, 2005), and because it reflects market expectations on the value of the company. This allows us to see the effects of our independent variables of interest more quickly, as compared to accounting the measures of performance.

More specifically, we performed a panel fixed effect regression following the results of Hausman test. When we regressed our independent variables over Tobin's Q in the OLS regression, we lagged the dependent variable by one year to be able to draw conclusions on the causality of the relationship. The model specification is as follows:

$$TobinQ = \alpha + \beta_1 gender + \beta_2 age + \beta_3 Science/Eng + \beta_4 Arts/Law/Bus + \beta_5 InternExp + \beta_6 Salary + \beta_7 Bonuses + \beta_8 Stocks + \beta_9 MrkCap + \varepsilon$$

## 4. Results and discussion

Table II displays the correlation matrix among the variables of interest.

The variable Female CEO is positively correlated with CEO age and international experience, meaning that female CEOs are more likely to be older and to have higher international experience when compared to male CEOs. In other words, companies require female CEOs being more international and having more experience when compared to male CEOs. This may signal a lack of trust by owners toward women, who need to wait longer and show more international experience to reach the position of the CEO.

Not surprisingly, science/engineering background is negatively correlated with arts/law/business background, meaning that CEOs that have a more humanistic background are less likely to have also a scientific background, even if some CEOs do hold degrees or masters belonging to both backgrounds. Arts/law/business background is also positively correlated with the international experience variable. Finally, CEOs that have international experiences are more likely to earn more (in terms of both total salary and total bonuses).

### *4.1 Owners' preference for CEO characteristics*

We tested our first two hypotheses both through an univariate test (Table III) and an OLS regression (Table IV).

The percentage of female CEOs is not significantly different between high-crisis-impact (4.8 per cent) and low-crisis-impact (5.9 per cent) companies. Both the *t*-test (*t* of 0.44) and the Wilcoxon test (Z of 0.45) indicate that the difference between the two means (and medians) is not significantly different from 0. Also, the high-crisis-impact variable of the OLS regression is not significant, thus confirming that the crisis did not affect the preference of shareholder for what concerns this particular CEO characteristic. Therefore, *H2a* is disconfirmed, and companies that were more severely hit by the crisis are not

**Table II** Correlation matrix

| *Variable* | *(1)* | *(2)* | *(3)* | *(4)* | *(5)* | *(6)* | *(7)* | *(8)* | *(9)* | *(10)* |
|---|---|---|---|---|---|---|---|---|---|---|
| Female CEO | 1 | | | | | | | | | |
| CEO age | 0.172*** | 1 | | | | | | | | |
| Science/engineering background | −0.023 | −0.071 | 1 | | | | | | | |
| Arts/law/business background | 0.028 | 0.059 | −0.567*** | 1 | | | | | | |
| International experience | 0.091* | −0.04 | 0.149*** | 0.058 | 1 | | | | | |
| Total salary | 0.005 | −0.005 | −0.008 | 0.077 | 0.135** | 1 | | | | |
| Total bonuses | −0.065 | −0.015 | −0.006 | 0.112** | 0.131** | 0.363*** | 1 | | | |
| CEO stock ownership | −0.031 | −0.035 | −0.070 | −0.235*** | 0.044 | −0.089 | −0.041 | 1 | | |
| Tobin's Q | −0.077 | −0.056 | 0.076 | −0.082 | −0.044 | −0.012 | 0.002 | 0.057 | 1 | |
| Market capitalization | −0.024 | 0.039 | −0.025 | 0.135** | 0.149*** | 0.135** | 0.070 | −0.068 | −0.029 | 1 |

**Notes:** The table displays Pearson correlation matrixes; coefficients' significance:; * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

**Table III** Differences of the CEO characteristics between high- and low-crisis-impact companies

| *Variable* | *High crisis impact* | *Low crisis impact* | *Difference (low − high)* | *t-test* | *Wilcoxon test* |
|---|---|---|---|---|---|
| Female CEO | 0.048 | 0.059 | 0.011 | 0.44 | 0.45 |
| CEO age | 52.53 | 53.70 | 1.18 | 1.8** | 1.07 |
| Science/engineering background | 0.55 | 0.37 | −0.18 | −3.17*** | −3.12*** |
| Arts/law/business background | 0.65 | 0.83 | 0.19 | 3.71*** | 3.63*** |
| International experience | 0.90 | 0.82 | −0.07 | −2** | −1.99** |
| Total salary | 890,588 | 782,259 | −108,329 | −2.65*** | −2.28** |
| Total bonuses | 898,322 | 737,119 | −161,203 | −2.43*** | −2.07** |
| Stock ownership | 1,004,070 | 900,240 | −103,830 | −2.26** | −3.50*** |

**Notes:** This table compares the CEO characteristics of high-crisis-impact and low-crisis-impact companies during the 2010-2012 period (after the crisis). The table reports the mean value of the CEO characteristics for the two sub-samples, the difference between the two values and two statistical tests (*t*-test and Wilcoxon test). The null hypothesis for both tests is that the difference between the mean values of each CEO characteristic is 0. There are roughly 336 observations for each variable, splitted in the two sub-samples; coefficients' significance:* $p < 0.10$,; ** $p < 0.05$; *** $p < 0.01$



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**Table IV** Differences of the CEO characteristics between high- and low-crisis-impact companies

| Variable | (1) Female CEO | (2) CEO age | (3) Science/ engineering | (4) Arts/law/ business | (5) International | (6) Total salary | (7) Total bonuses | (8) Stock ownership |
|---|---|---|---|---|---|---|---|---|
| High-crisis-impact | −0.004 (0.025) | −0.192 (0.756) | 0.191*** (0.060) | −0.031 (0.050) | 0.089** (0.041) | 92.11** (39.13) | 224.25*** (76.70) | 10.949** (5.794) |
| Market capitalization | −0.001 (0.001) | −0.001 (0.001) | −0.001 (0.001) | −0.001* (0.001) | 0.001*** (0.001) | 0.001*** (0.001) | 0.001 (0.001) | −0.001* (0.001) |
| Tobin's Q | −0.025** (0.008) | 0.281 (0.753) | 0.088*** (0.025) | −0.061** (0.027) | 0.036** (0.015) | −27.93 (21.94) | −15.90 (34.45) | −2.214 (1.420) |
| Return on equity | 0.001** (0.001) | −0.007 (0.018) | −0.002* (0.001) | 0.001 (0.001) | −0.001 (0.001) | 0.853 (1.505) | 1.83 (2.06) | −0.034 (0.075) |
| Industry | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 306 | 306 | 293 | 293 | 306 | 297 | 297 | 296 |
| F | 1.03 | 7.16*** | 461*** | 12.58*** | 3.14*** | 102*** | 4.77*** | 70.46*** |
| $R^2$ | 0.11 | 0.06 | 0.31 | 0.37 | 0.33 | 0.31 | 0.09 | 0.06 |

**Notes:** The dependent variable is female CEO in Model 1; CEO age in Model 2; science/engineering background in Model 3; arts/law/business background in Model 4; international experience in Model 5; total salary in Model 6; total bonuses in Model 7; stock ownership in Model 8. The main independent variable of interest is high-crisis-impact, which is a dummy variable equal to 1 for high-crisis-impact companies and 0 otherwise; coefficient's significance:; $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$

signaling any higher sustainability orientation (Bear *et al.*, 2010) by appointing a woman as the CEO.

About the background of CEOs, Model 3 of Table IV shows that the dummy variable high-crisis-impact has a positive and significant impact in determining CEO with science/engineering background, while it has no impact in determining CEO with arts/law/business background. Moreover, according to Table III, 55 per cent of the CEOs of high-crisis-impact companies have a background in science and engineering, while only 37 per cent of CEOs of low-crisis-impact companies do. Conversely, 83 per cent of CEOs of low-crisis-impact companies hold a degree in arts, law or business, and 65 per cent of CEOs of high-crisis-impact companies have a degree in science and engineering. The results do not sum up to 100 per cent because some CEOs have both backgrounds (for instance, because after a degree in chemistry, they also got an MBA). These empirical results allow disconfirming *H2b*: in the post-crisis period, CEOs of high-crisis-impact companies do actually hold more often a degree in science and engineering as compared to a degree in arts/law/business.

The average CEO age is 52.53 for high-crisis-impact companies and 53.70 for low-crisis-impact companies. This difference is significant according to the *t*-test but not according to the Z test. According to Model 2 of Table IV, the degree of impact of the crisis did not play a role in determining the CEO age. Overall, this result allows us to disconfirm *H2c*: companies that were most severely hit by the crisis do not choose younger CEOs.

In total, 90 per cent of CEOs of high-crisis-impact companies have an international experience, while only 82 per cent of CEOs of low-crisis-impact companies do. The result is robust both to the *t*-test and to the Wilcoxon test. Moreover, the high-crisis-impact dummy variable in Model 5 (Table IV) is significant and positive, thus confirming the result. These empirical results allow confirming *H2d*.

Finally, *H2e* predicted that companies that were most severely hit by the crisis do remunerate their CEOs through stock options to a higher extent, as the financial crisis signaled the existence of strong conflicts of interests between managers and owners. Empirical results allow confirming this hypothesis: on average, CEOs of high-crisis-impact companies receive 1,004,070 euros of stocks, while CEOs of low-crisis-impact companies only 900,240 euros. The difference is statistically significant both according to the *t*-test and to the Wilcoxon test. Also, according to the OLS regression displayed in Table IV, the degree of impact of the crisis did have an impact on CEOs' stock ownership.

Overall, these results allow confirming *H1*, which predicted that the global financial crisis highlighted three success factors that in turn changed owners' preferences towards the characteristics of the CEOs. With the only exception of the variable female CEO, CEOs of high- and low-crisis-impact companies are, in fact, significantly different as compared to other CEOs.

To make this result more robust, we performed other empirical tests by comparing some CEO characteristics of high- and low-crisis-impact companies in the period before the crisis. Table V reports the results.

With the partial exception of total salary, the variables are not significantly different between low- and high-crisis-impact companies before the financial crisis. This result is consistent with our explanation: the financial crisis did change owners' preferences toward the characteristics of their CEOs. Because our analysis does focus on the pre-crisis environment, we did not manage to collect all the variables described in Tables III and IV also for the period before the crisis. This is a shortcoming, but at the same time, we point out that Table V is only a robustness test, and not the central part of our work.

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**Table V** Differences of the CEO characteristics between high- and low-crisis-impact companies (before the crisis)

| *Variable* | *High crisis impact* | *Low crisis impact* | *Difference (low − high)* | t-*test* | *Wilcoxon test* |
|---|---|---|---|---|---|
| Female CEO | 0.065 | 0.030 | −0.034 | −0.22 | −0.23 |
| Total salary | 799,908 | 705,848 | −94,059 | −1.71** | −1.70* |
| Total bonuses | 871,192 | 710,950 | −160,241 | −1.15 | 0.62 |

**Notes:** This table compares the CEO characteristics of high-crisis-impact and low-crisis-impact companies for the 2006-2009 period (before the crisis). The table reports the mean value of the CEO characteristics for the two sub-samples, the difference between the two values and two statistical tests (*t*-test and Wilcoxon test). The null hypothesis for both tests is that the difference between the mean values of each CEO characteristic is 0. There are 20 observations for the female CEO variable, 246 for the total salary variable and 237 for the total bonuses variable; coefficients' significance; *$p < 0.10$; **$p < 0.05$; *** $p < 0.01$

### *4.2 The impact of CEO characteristics on financial performance*

The third hypothesis of our article aimed at testing the relationship, in the 2010-2012 period, between the CEO characteristics variables and the performance of companies, as measured by Tobin's Q. Results are displayed in Table VI.

The first model of Table VI is a panel data regression with fixed effects. The regression is run over 288 observations, and is significant at the 1 per cent level. The $R^2$ is 10 per cent. The second model is a standard OLS regression, where the dependent variable is again Tobin's Q. To capture the cause and effect relationship between CEO characteristics and financial performance, we lagged the dependent variable of one year. This is because we assumed that the effect of the new strategies implemented by the CEOs does take at least one year to have an impact on the dependent variable. Model 2 is overall significant at the 1 per cent level with a $R^2$ of 13 per cent.

The results indicate that arts/law/business background has a negative impact on the financial performance of companies. This result is particularly strong because it holds in both specifications. In Model 1, the coefficient (−0.281) is significant at the 10 per cent level; in Model 2, the coefficient (−0.381) is significant at the 5 per cent level. This allows disconfirming *H3b*.

Conversely, *H3d* ("Companies with CEOs with an international experience have better financial performance") is confirmed. The coefficient of the variable International experience is positive and significant at the 10 per cent level in Model 1.

**Table VI** The relationship between CEO characteristics and financial performance

| *Variable* | *(1)* | *(2)* |
|---|---|---|
| CEO age | 0.006 (0.007) | −0.012 (0.009) |
| Science/engineering background | −0.039 (0.114) | 0.065 (0.151) |
| Arts/law/business background | −0.281*(0.164) | −0.381**(0.188) |
| International experience | 0.208*(0.129) | −0.074 (0.160) |
| Female CEO | −0.138 (0.492) | −0.255 (0.258) |
| Stock ownership | −3.089*(1.688) | −3.289 (1.689) |
| Market capitalization | 7.096***(2.556) | 7.237 (0.209) |
| Constant | 1.442***(0.451) | 2.598***(1.706) |
| Industry | Yes | Yes |
| Country | Yes | Yes |
| N | 288 | 288 |
| F (W) | 14.31*** | 2.43*** |
| $R^2$ | 0.10 | 0.13 |

**Notes:** The dependent variable is Tobin's Q. Model 1 is a panel data fixed effect. Model 2 is a standard OLS regression, where the dependent variable (Tobin's Q) has been lagged of one year; coefficients' significance:; *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

All the other hypotheses are disconfirmed. *H2e* ("Companies with CEOs that have high stock ownership have better financial performance") is disconfirmed because the coefficient is negative and significant at the 10 per cent level. This means that the more the companies remunerate their CEOs through stock options, the lower the financial performance. *H2a* and *H2c* are disconfirmed because age and the gender of the CEO do not have any impact on financial performance.

### 4.3 Discussion

The upper echelons theory plays a central role in the field of management. Some characteristics of CEOs, such as functional background, age, gender and educational background, can indicate the leadership style, personality and aptitudes on strategic issues of the CEO (Zajac and Westphal, 1996). Conversely, the owner identity theory argues that different types of owners determine the characteristics of the top management and of the board (Thomsen and Pedersen, 1997, 2000; Pedersen and Thomsen, 2003).

In this article, we propose a dynamic approach to test both the CEO characteristics and the owner identity literature by analyzing how the owners' preferences for the characteristics of CEOs changed after the financial crisis. For instance, rather than directly testing whether CEO age is correlated with risk (static approach), we test how the preference of owners for CEO age changed due to the financial crisis (dynamic approach).

Our empirical results indicate that in the post-crisis period, CEOs of companies that were most severely hit by the crisis are significantly different as compared to other CEOs (*H1*). In particular, owners of high-crisis-impact companies choose CEOs that have a background in science or engineering, that have international experience and that are remunerated to a higher extent through stock options.

These results are consistent with and extend the owner identity theory, predicting that shareholders do intervene in the determination of the characteristics of top management (CEOs).

The result is particularly fascinating, when interpreted in light of the owner identity literature, because it shows that owners' preferences for CEO characteristic change over time. Our results suggest that owners do not only determine the characteristics of new CEOs. Rather, they also have expectations about the success factors and CEO characteristics that the company will need to be successful. Given these elements, they will determine the new CEO accordingly.

When we test the impact of these CEO characteristics on financial performance in the 2010-2012 period, we find that arts/law/business background and stock ownership have a negative impact on financial performance, while international experience has a positive impact. The lack of strong statistical significance of these results about financial performance may be because the relationship between CEO characteristics and financial performance will arise in the long term, while we are considering only a three-year period. Another difficulty may be because such characteristics "co-exist" in the same CEO, and this makes the relationship between CEO characteristics and performance noisier.

The present article provides a relevant contribution to current literature because of three main reasons. First, it extends and merges the CEO characteristics (Hambrick and Mason, 1984) and the owners identity literature (Thomsen and Pedersen, 1997, 2000; Pedersen and Thomsen, 2003). It does so in a dynamic perspective, thus looking at changes in CEO characteristics due to a specific event (the global financial crisis), rather than looking at such relationships in a static perspective. Second, our results may be of interest to investors, policy-makers and universities or teaching institutions. For instance, investors may be interested in understanding whether the profile of the CEO of a certain company they are considering investing in is consistent with the success factors that are required to be successful in the future. Universities may consider revising their teaching courses to include courses, providing students with skills that investors consider to be relevant in the

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future environment. Third, our paper focuses also on the Continental European setting, which has often been generally overlooked by previous literature, probably because of the lack of empirical data. We rely on a unique hand-collected database on CEO characteristics, which allows us to draw unique conclusions.

An important idea our analysis is grounded on is that there is not a standard or "best" profile for CEOs. The profile of the CEO needs to match the specific context in which the company operates, both in terms of cultural environment (Fukuyama, 1995), industry and historical period. In particular, this article focuses on the latter element: the characteristics CEOs were required to possess after the crisis are not the same as before the crisis. This is clearly shown by our results displayed in Table V. It may be the case that in the early 2000, older CEOs were "better" than younger CEOs, because of the features of the external environment. But, after the crisis, the situation had changed. There is not a "good" or "bad" profile, but only a profile that is suited for particular periods or contingencies. This notion is not developed enough in current literature (Rajagopalan and Datta, 1996), mainly because of the static approach of previous studies.

## 5. Conclusion and future research

This article provided an answer to the following research question: how did owners' preferences for CEO characteristics change after the global financial crisis? To provide our answer, we proposed three success factors that companies need to possess to successfully compete in the post-crisis environment:

1. sustainability orientation;
2. aptitude towards internationalization and change; and
3. minimization of the agency conflicts.

We then identified five CEO characteristics that are in line with these factors, and we found that CEOs of high-crisis-impact companies are significantly different when compared to other CEOs. More specifically, they have a background in science or engineering; they have international experience; and they are remunerated to a higher extent through stock options. Our results also indicate that only international experience had a positive and significant impact on financial performance after the crisis.

This article adds to current literature on CEO characteristics because we adopt a dynamic, rather than a static, perspective. This allows us to interpret CEO characteristics not as good or bad *per se*, but conditional on the historical period. Our results also contribute to the owner identity literature, because they are consistent with the idea of shareholders modifying their preferences for top management characteristics over time and acting accordingly. The article also relies on a unique hand-collected data set that allows drawing inferences on the European context, which has been largely overlooked because of the lack of data.

We believe our results will be of interest to investors, policy-makers and universities or teaching institutions. For instance, investors may be interested in understanding whether the profile of the CEO of a certain company they are considering investing in is consistent with the success factors that are required to be successful in the future. Universities may consider revising their teaching courses to include courses providing students with skills that investors consider to be relevant in the future environment.

Further research is needed to better understand the evolution of the preferences of shareholders for CEO characteristics. In particular, the analysis could be replicated in different cultural contexts. Do we find the same results in the USA or in Latin America? Why? Which are the moderating variables which shaped owners' preferences for CEO characteristics after the global financial crisis?

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