



Can Female CEOs of Multinational Companies Play A Role in Improving Both Organizational Practices and Innovation?

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Abstract

The present research analyses the influence of both characteristics and management methods of female CEOs on organizational practice and innovation. This qualitative and comprehensive study looks at 105 female CEOs of big international companies in 2014. The research results suggest that the characteristics of female CEOs lead to a specific management style which in turn influences organizational practice, promoting diversity and innovation in the workplace. The theoretical hypotheses validated by empirical research have enabled the development of a mathematical model which demonstrates how either the personal characteristics or professional practices of female CEOs could determine innovation.

Keywords: Top management, innovation, qualitative comprehensive study, mathematical model

Introduction

The topic of women in CEO positions has been the subject of longstanding interest among career academics and it continues to garner further interest. Indeed, women are increasingly being appointed as Chief Executive Officer – CEO in global companies such as General Motors, Yahoo Inc., IBM, and PepsiCo. Fortune magazine has shown

an interest in this phenomenon, investigating the identity, characteristics and achievements of such women. Catalyst (2015) reveals that the number of female CEOs in large companies began to increase in the 2000s, before accelerating until 2014 with the following results: 24 female CEOs in Fortune 500 companies (4.8 percent), and 54 female CEOs in Fortune 1000 companies (5.4 percent). This phenomenon

is sufficiently recent to be qualified as a rupture. Moreover, this phenomenon is also observed in a diverse range of countries including the United States, the United Kingdom, Saudi Arabia and India.

Some countries are considering, to a greater or lesser extent, the implementation of policies to promote female access to senior corporate positions. For example, France has implemented measures (the 2011 Copé-Zimmermann law) in favor of a balanced representation of men and women at the highest levels. Thus, many large companies are initiating schemes based on mentoring support to develop social capital and women's careers.

Mohan (2014) highlights the fact that although women on corporate boards have been studied by a large pool of literature (Hillman et al, 2002; Davidson and Burke, 2004; Huse and Solberg, 2006; Adams and Ferreira, 2009; Loukil and Yousfi, 2015, among others), the impact of female CEOs on organizational practices is relatively under research. However, research has highlighted bias regarding male and female roles in business, particularly concerning the position of CEO (Carli, 2001). Other studies have examined the characteristics of CEOs (demographic characteristics and other observable characteristics) which are assumed to influence strategic choices and, thus, company performance and how these characteristics are demonstrated by female leaders (Hambrick, 2007). According to the upper echelons theory set out by Hambrick and Mason (1984), these characteristics supposedly influence strategic choices, which, in turn, determine company performance outcomes. In this field, Henderson et al. (2006) have demonstrated that CEO profiles are closely related to company revenues. In addition to this, CEO managerial actions are constrained by the environments in which companies operate, such as the industrial context. (Henderson et al, 2006). Empirical research (Hurley and Choudhary, 2016; Wang et al, 2016) has shown that the personal attributes of CEOs (such as age, nationality, level of education, marital status, number of children, management experience, etc.) are appropriate criteria for measuring critical human resources to determine whether a company will achieve superior outcomes.

Nevertheless, existing research has not yet clearly established the role of the characteristics of female CEOs, nor developed an understanding of their professional practice with regard to management styles, work organization and innovation (Kitchell, 1997; Palvia et al, 2015; Glass and Cook, 2017). Thus, a current research stream is investigating the ways in which female CEOs are changing subtle everyday norms and practices within the workplace (Fawcett and Pringle 2000; Ingersoll et al, 2017; Soklaridis et al, 2017). Van de Ven (1986, p.591) defines innovation as "the development and implementation of new ideas by people who over time engage in transaction with others within an institutional order." Dezso and Ross (2008) suggest that the "feminine" management style, which encourages cooperation, teamwork and creativity, is highly valued in innovative industries and companies. Should we expect new "feminine management" practices to appear?, not enough evidence is currently available to give a comprehensive answer to this question. However, examples of the discourse and representation conveyed by female CEOs with regard to their management roles already exist in the media. Thus, given the theoretical contribution of past research, this article adopts an overall approach to examine specific influential factors in the management practices implemented by female CEOs, with the aim of addressing the following question: how do the characteristics and professional practices of female CEOs influence the development of large international companies, particularly, their innovative capacities?

The theoretical section of this article presents the existing literature on the characteristics of female CEOs in large organizations, in order to highlight the specificities of their managerial practices. The empirical section presents the findings of this paper's analysis of 860 professional publications pertaining to the individual characteristics of 105 female CEOs, the everyday reality of their professional practice, and the practices of the large organizations which they manage. This paper focuses on how the specific management styles of female CEOs

influences their organization's capacity for innovation. From this conceptual model based on four proposals, a

mathematical model is developed which demonstrates how the personal characteristics and professional practices of female CEOs can determine innovation. In the final section, the theoretical and managerial implications of the study are discussed, together with its limitations and avenues for future research.

Female CEOs in Large Organizations

Research on the topic of female CEOs has particularly focused on their personal characteristics, alongside professional practices in the companies they manage.

The Personal Characteristics and Professional Practices of Female CEOs

According to Hambrick (2007), the personal characteristics of CEOs (age, nationality, highest level of education, marital status, number of children, management experience...) influence their strategic choices, which in turn determine the performance of the company. However, research shows that, despite the levels of qualification and experience equivalent to those of male CEOs, women are underrepresented in the governance of organizations, that they tend to occupy functional positions and are less likely to accede to highly paid positions. In addition, theoreticians of the role of incongruity have long claimed that stereotypes concerning leadership positions generate prejudice against groups which have not traditionally occupied management positions. For example, Schein (1973) proposes that stereotypes influence the perception that women are less qualified than men are for management positions. Thus, Matsa and Miller (2011) highlight how gender discrimination or stereotyping may be attributed to the historic absence of women in top management positions, which, in turn, prevents women from having access to same-sex mentoring. Moreover, women in management positions who control the decisions, salaries and finances of an organization tend to be criticized due to the perception that the usual hierarchical

relationship between the two sexes has been reversed (Carli, 2001). Consequently, Eagly and Karau (2002, p.574) stress that "Gender stereotypes thus follow from observations of people in sex-typical social roles, especially men's occupancy of breadwinner and higher status roles and women's occupancy of homemaker and lower status roles". Because of these stereotypes, jobs are often "gendered," such that employers' orient men towards leadership roles and women towards other positions.

Hence, the first proposal is:

Proposal 1. The personal characteristics of female CEOs influence their professional practices

The professional practices of female CEOs and changes in organizational practices

Burt (1998) and Leszczyńska and Lesca (2014) highlight the fact that the glass-ceiling phenomenon in American companies is maintained as much by societal and organizational barriers to women as by their lack of access to influential networks. Thus, some authors have investigated the mechanisms, levers and resources that have enabled female CEOs to break through the glass ceiling (Fitzsimmons et al., 2014; De Klerk and Verreynne, 2017; Leszczyńska and Chandon, 2019). In this domain, the research of Battilana and Dorado (2010) and Tracey et al. (2011) explores the paths by which organizations establish or change their main practices. These practices are understood as a series of significant activities, produced by wider cultural beliefs and reflected in the individual and organizational action (Jarzabkowski, 2004). For example, Jarzabkowski et al. (2009) underline the personal characteristics such as cognitive and symbolic elements used by individuals in their social interactions to reproduce and change organizational practices. Thus, some authors (Agrawal and Knoeber, 2001; Leszczyńska and Lesca, 2014, 2017; Leszczyńska and Thénot, 2019; Leszczyńska et al., 2020) show how choices influenced by the personal and professional characteristics of CEOs, together with the managerial practices they introduce to their organization, are essential for companies.

The questions of whether the decisions of female CEOs will be approved and carried out by the significant majority of male staff in such organizations, and how to explain their professional practices could be raised. Here, “practices” refer to the actions through which managers carry out their daily work (Jarzabkowski, 2004). Organizational practice change can, therefore, result in:

- Modifications in the execution of routines and practices,
- Changes in occupations within an organization (De Bruijn and Volman (2000),
- Changes in internal organizational processes (Bolton et al, 2011).

Psychogios (2007) theorizes about female management styles and their potential role as transformational leaders. This view sees an organization as constantly changing, and in which the origins of new practices are to be found in the everyday activities of economic actors.

Hence, the second proposal is:

Proposal 2: The professional practices of female CEOs are conducive to changes in organizational practices

The Role of Female CEOs’ Professional Practices in Generating Innovation

The outcomes of existing research are contradictory regarding the influence of female CEOs’ professional practices on innovation. Firstly, one factor featured in the literature is the argument that women seem to be more opposed to risk than men (Bernasek and Shwiff, 2001; Faccio et al, 2016), as demonstrated, for example, by their investment decisions. In addition, research has shown that because of such greater risk aversion, companies run by female CEOs take fewer risks and have a greater chance of survival (Faccio et al, 2016; Palvia et al, 2015).

Secondly, large, medium and small American companies alike led by female CEOs systematically achieve better results than those led by men (Vieito, 2012). Moreover, research suggests that female CEOs exercise a friendlier, more well-meaning approach to organizational objectives and labor relations policies

(Eagly, 2005). Thus, Glass and Cook (2017) find that companies with female CEOs are associated with stronger business and equity practices. Dezsö and Ross (2012) highlight how female leaders place greater emphasis on novelty and innovation compared to men. For example, and in contrast to the above assertion, an empirical study of CEOs undertaken by Adams and Funk (2009) revealed that, compared to men, female CEOs tend to be less risk averse, traditional, and conformist. Given the advances made in previous research, academics are now looking to clarify the role of female CEOs in the development of innovation (Soklaridis et al, 2017).

Hence, the third proposal is:

Proposal 3: The professional practices of female CEOs promote innovation

The Role of Changes in Organization Practices in Innovation

Grin et al. (2018) highlight how contemporary companies require novel kinds of leadership, which can both stimulate new organizational practices and changes in practices and structures within the organization. For example, Brooks (2002) identifies innovative organizational practices which link labor and community, combine conflict tactics with direct service and develop leadership, as well as how these organizing strategies and changes in organizational practices contributed to changes in workplace policies.

Hence the fourth proposal is:

Proposal 4: Changes induced by female CEOs on organizational practices promote innovation

Methodology

The aim of the present research is to fill an empirical research gap by investigating how the characteristics and professional practices of female CEOs influence the development of the large companies they manage. The theoretical proposals of this qualitative study is concerned with conceptual reasoning and are tested using a study of data pertaining to 105 female CEOs. While the number of female CEOs continues

to increase, researching these senior executives based on direct observation has not been possible, due to their inaccessibility (Hambrick, 2007). Thus, the present paper draws its data through an analysis of a broad range of secondary data (documentary analysis), including media reports in prominent business publications. Documentary analysis is itself the subject of increasing interest in academic literature and a respected source of data for management academics. For example, the leadership studies undertaken by Manner (2010) analyze secondary data in order to compile data on educational and functional experience. Thus, in keeping up with the recommendations set out by Manner (2010), the present empirical research uses publicly available data to analyze the characteristics and experiences of female CEOs in large companies, along with the practices of these companies. The sample used for this research comprised 54 female CEOs of organizations featured among the 1000 ranked by Fortune magazine in 2015, together with 51 female CEOs at the head of large non-American companies not featured in the Fortune 1000 but listed by Forbes and/or Fortune as being among the most powerful women in the world. Thus, this research covers the characteristics of a sample of 105 women who, in 2014, were either CEOs of large companies or occupied a similar position. The list of these 105 female CEOs is presented in Appendix 1.

In keeping up with Manner (2010), the data on female CEOs used in the present study was obtained from business and trade magazines (The Economic Times of India, USA Today, Forbes, Fortune, Harvard Business Review, gsb.stanford.edu, The Financial Daily, Bloomberg, firstpost.com, etc.),

More precisely, 860 documents covering the period between November 2008 and December 2015 were studied. Interviews were also analyzed, and it was observed that newspaper articles would often state opinions and perceptions concerning women in senior management positions. The following company characteristics were studied: the industrial sector (e.g. finance, energy, etc.); the type of industry

(transport, commerce, financial services, property, banking services, etc.) and finally the country in which the company's head office was based (Karami et al, 2006).

The characteristics of the female CEOs were analyzed, regarding their education and professional experience based on standard magazines such as Fortune, Forbes, Business Week, and Hoover's Online. Other available sources such as company websites, business magazines and autobiographical works were also used to compile these data. Perceptions of the professional practices of female CEOs based on face-to-face interviews given to journalists, published autobiographies, personal testimonies and other documents published in specialized press were analyzed. This provided rich qualitative data which enabled an exhaustive reconstruction of the numerous professional practices of female CEOs, essential for a thorough analysis with regard to the research question. Miles and Huberman's (2003) prescriptive principle was used to code the data and NVIVO software to process the qualitative data. Thus, the initial list of codes developed in the conceptual analysis stage was elaborated during the qualitative analysis stage, presented in Appendix 2.

Findings

Personal Characteristics and Professional Practices of Female CEOs

Female CEOs tend to emphasize the importance of family life for them, and explicitly divulge how they endeavor to find a balance between their personal and professional duties. They often confirm that their education influenced their initial choice of career as legal expert, historian, teacher, journalist or diplomat (without foreseeing a career as CEO). A quarter of them (25.7 percent) acknowledge support received from mentors who recognized their high potential and stress the importance of such support (but without considering lack of a mentor as an obstacle). As found by Carli (2001), 22 percent of the female CEOs studied have at some point been the subjects of controversy provoked by their opponents and dissatisfied active

investors. These critics question their skills, their career, their management style, their lack of experience, their overlong tenure as CEO, their excessive salary, their inability to take risks, etc.

When female CEOs are appointed, they face different institutional contexts:

- On becoming the first female CEO in their company's history and becoming the only woman on the board of directors, they alter their company's culture and management practices. For example, in India, firstpost.com announced, about Arundhati Bhattacharya, CEO of State Bank of India, "She has a collaborative leadership style, which will help her in dealing with trade unions, which the former chairman faced problems with" (October 9, 2013).
- Female CEOs work in industries dominated by men, and in which they are gradually able to introduce new practices to promote diversity within the company. For example, Mindy Grossman, CEO of HSN, states in an interview given to gsb.stanford.edu (June 5, 2014): "Now I have frequent breakfasts and lunches with employees. I learn more from those than from reading any report."
- Female CEOs have encountered an egalitarian culture in their company and recognition of the importance of diversity, and in turn promote such practices in their professional environment. "Before any decision, I make it a rule to discuss it with my staff, so that people take responsibility for it" stresses Linda Jackson, CEO of Citroën, in an interview granted to capital.fr (October 6, 2015).

This results support proposal 1, that the personal characteristics of female CEOs influence their professional practices.

The professional practices of female CEOs and changes in organizational practices

Several changes made to practices in their institutions are observed, as expressed by female CEOs themselves. "These changes will enable GM to institutionalize the culture and management-approach changes implemented over the past several years,

while reinforcing that it has talented executives that will be developed and moved through the ranks," Mary Barra, CEO of General Motors, stated in an interview published by USA Today (December 11, 2013). MaryAnne Gilmartin, CEO of Forest City Ratner, adds, "We're not dumb in manufacturing; we need a lot more flexibility than you're allowing us to have. And we now have more than a few women plant managers and Hispanic plant managers" (womenincre.uli.org, December 5, 2014). This point of view is more particularly supported by a number of female CEOs who have children. These include Marissa Mayer, CEO of Yahoo (timesofindia.indiatimes.com, December 10, 2015): "The Company has offered flexible options to new mothers, and we are interested in offering more flexible options to fathers. The company offers a relatively generous package for new parents, including allowing new moms who give birth as many as 16 weeks of paid leave."

The actions of female CEOs aiming to change practices also extend to the company environment. For example, Rosalind Brewer, CEO of Sam's Club: "leans on suppliers to include more women and minorities in top positions" (bizjournals.com, December 16, 2015). Denise Morrison, CEO of Campbell, states (linkedin.com, October 13, 2014): "The path to diversity begins with supporting, mentoring, and sponsoring diverse women and men to become leaders and entrepreneurs. For instance, we've established distinct business resource affinity networks for our women, Hispanic, African American and Asian employees. Externally, we are partnering with or sponsoring non-profit organizations like the National Society of Hispanic MBAs."

These findings support proposal 2, which states that the professional practices of female CEOs are conducive to changes in organizational practices.

Promotion of Innovation by Female CEOs

Savarese (CEO of Cape Cod Five Cents Savings Bank) said that industry needs "female CEO's creativity and collaborative approach and innovation and insights. We have got to develop our human talent, and if

we ignore half of that, we're not going to be competitive." (Connecticut Women in Banking conference, April 2015). In this context, Linda Jackson, CEO of Citroën, stresses: "We want to be more creative, affordable and offer things that really matter to mainstream customers, we want to be innovative in design – we've been good at that in the past and new models" (autoexpress.uk, May 9, 2014).

In addition, female CEOs of large companies are personally committed to innovation. For example, Marissa Mayer, CEO of Yahoo, is famous for innovation "Ms. Mayer served in numerous positions, including engineer, designer, product manager and executive, and launched more than 100 well-known features and products. Products have to be created in a way that is 'frictionless and beautiful' (Wall Street Journal, December 3, 2012).

Cathy Engelbert, CEO of Deloitte LLP, "plans to focus on innovation, both in terms of people and new technology, in her tenure. She wants to be remembered as a CEO who fostered an innovative culture, where people can grow and develop. And nothing, she noted, makes her as proud as when a mentee gets promoted" (bizjournals.com, Mar 27, 2015). Meanwhile, Helena Foulkes, CEO of CVS "is credited with leading innovations such as groundbreaking pharmacy healthcare programs, such as Maintenance Choice and Pharmacy Advisor, as well as ExtraCare, the largest retail loyalty program in the country with more than 70 million active cardholders" (www.cvshealth.com). "We launched our Innovation Station more than two years ago to help us transform the way we deliver on innovation and new technology," explains Margaret Keane, CEO of Synchrony

Financial (www.forbes.com, May 10, 2015).

These findings support proposal 3, which states that the professional practices of female CEOs promote innovation.

Female CEO-led changes in organizational practices and innovation

Female CEOs have been shown to demonstrate innovation-favorable actions in their companies. "Today, General Motors fosters a bold new culture, one which promotes innovation and encourages risk taking" states Mary Barra, CEO of General Motors in an interview with The Financial Daily (January 14, 2014). Similarly, Marla Kaplowitz (CEO of MEC North America) stresses, in an interview published by bloomberg.com, (November 16, 2015): "We focus on building a strong and collaborative culture where people thrive and ideas flourish." "In order to continually fill the innovation funnel, Denise M. Morrison (CEO of Campbell Soup Company) has implemented an entirely new innovation process at Campbell North America. Its breakthrough innovation teams comprise: a marketer, a consumer-insights expert, a packaging engineer, a product development expert and a chef" (campbellsoupcompany.com, April 30, 2014). "So, I thought we had to rethink our innovation process and design experiences for our consumers—from conception to what's on the shelf" adds Indra Nooyi, CEO of PepsiCo (Harvard Business Review, September 2015). For example, to satisfy the needs of their companies and develop new action plans, female CEOs have led actions resulting in successful digitalization, brand reinvention, international growth, promotion of social responsibility, new managerial orientations to support female staff within their company, and other innovative procedures.

These findings support proposal 4, which states that the changes induced by CEO women in organizational practices promote innovation.

Formal Mathematical Model

Appendix 2 shows the different items defining both personal characteristics and professional practices of female CEOs and the changes induced by female CEOs in organizational practices. So personal characteristics of female CEOs (**Pc**), their professional practices (**Pp**) and the changes they induce (**Op**) are represented respectively by the following vector:

$$\mathbf{Pc} = (Pc_1, Pc_2, Pc_3, Pc_4, Pc_5, Pc_6),$$

Wherein Pc_1 and Pc_3 are respectively 'Age' and 'Number of Children', and Pc_2, Pc_4, Pc_5 and Pc_6 are numerical variables associated, respectively, with 'Marital Status', 'Nationality', 'Level of Education' and 'Management Experience'.

$$\mathbf{Pp} = (Pp_1, Pp_2, Pp_3, Pp_4, Pp_5, Pp_6, Pp_7, Pp_8, Pp_9, Pp_{10}),$$

$Pp_1, Pp_2, Pp_3, Pp_4, Pp_5, Pp_6, Pp_7, Pp_8, Pp_9$ and Pp_{10} are numerical variables, respectively, representing 'Career Aspirations', 'Understanding of Self-Confidence', 'Management Style', 'Value placed on Work', 'Symbolic Influence', 'Organizing Strategies', 'General Interest Activities', 'Support for Innovation', 'Attitude towards Risk' and 'Prestige'.

$$\mathbf{Op} = (Op_1, Op_2, Op_3, Op_4, Op_5),$$

Op_1, Op_2, Op_3, Op_4 and Op_5 are numerical variables respectively, expressing, 'Criticism and Controversy', 'Changes to the Performance of Routines and Practices', 'Changes in Internal Processes', 'Gender Stereotypes' and 'Mentoring'.

Proposal 1 implies that \mathbf{Pp} depends on \mathbf{Pc} so there exists a vectorial function \mathbf{F} such that

$$\mathbf{Pp} = \mathbf{F}(\mathbf{Pc}), \tag{1}$$

Proposal 2 implies that \mathbf{Pp} has a positive effect on \mathbf{Op} so there exists an increasing vectorial function \mathbf{F}_1 such that

$$\mathbf{Op} = \mathbf{F}_1(\mathbf{Pp}), \tag{2}$$

The degree of global innovation is measured by a scalar variable I , proposals 3 and 4 state that \mathbf{Op} and \mathbf{Pp} are favorable to innovation, so there exists a vectorial increasing function \mathbf{F}_2 such that

$$I = \mathbf{F}_2(\mathbf{Pp}, \mathbf{Op}), \tag{3}$$

Combining (2) and (3), we can see that there exists a direct increasing function \mathbf{F}_3 which expresses I in terms of only \mathbf{Pp}

$$I = \mathbf{F}_2(\mathbf{Pp}, \mathbf{F}_1(\mathbf{Pp})) = \mathbf{F}_3(\mathbf{Pp}), \tag{4}$$

Combining (4) and (1), we see that there exists a function \mathbf{F}_4 which shows that innovation can be determined by \mathbf{Pc} alone

$$I = \mathbf{F}_3(\mathbf{F}(\mathbf{Pc})) = \mathbf{F}_4(\mathbf{Pc}). \tag{5}$$

Discussion and Conclusion

This research contributes to the current research stream on female CEOs by new light on the influence of feminine management styles on the implementation of new organizational practices promoting diversity and innovation. Eagly's (2005) work established that when CEOs lack experience in their position, they implement new management practices which enable them to act as senior managers in line with their personal convictions. Thus, in keeping with the findings of Glass and Cook (2017), the procedures implemented by female CEOs which promote diversity, to gain cognitive, moral and pragmatic legitimacy, are used with the aim of changing the culture and everyday practices of their organization both substantially and sustainably.

Subsequently, this situation can lead to a better understanding and a more diverse expression of market/product strategies, thus promoting innovation and fostering better decision-making. By confirming that female CEOs do tend to foster practices which promote innovation, as foreseen by the gender difference perspective (Adams and Funk, 2009), the results of this study show that they seem capable of making significant contributions, especially in the field of diversity.

This research develops this stream by showing that the traits of female CEOs are linked to the choices made by their companies. **The managerial implications** of this research include the importance of fostering and developing certain personal characteristics in current and future female CEOs. This argument is supported by the main result of the mathematical model, showing that the personal characteristics and/or professional practices of female CEOs can alone determine innovation (equation (5)). Female CEOs themselves highlight both the existence of discrimination in several higher education disciplines and in companies, and the fact that women are excluded from management in some sectors of industry. Thus, the characteristics and practices of

analyzing empirical data on the individual characteristics of the rarely studied population of female CEOs in international groups and their specific management styles. Secondly, the present results shed female CEOs are likely to represent strengths in the transformational development of their company. For example, Ursula Burns, CEO of Xerox (interview with "The Economic Times of India", 30 August 2013), explains that the greatest challenges for female CEOs are those of taking the right decisions for their company and helping to transform a culture that could either be that of the company or of the individual. Indeed, Xerox is a pioneer in the development of policies promoting social diversity and inclusion through work. But they cannot achieve this alone, they need the active support of men who believe in their skills and potential, together with that of women leaders acting both as "models" and mentors. This survey may indicate that women who become Fortune 500 CEOs are more innovative, but this may be the same for CEOs, generally. For this reason, we need to prepare future leaders with support from elder male and female leaders and mentors, and access to different socialization networks, as well as through appropriate internal and external training. The success of such preparation is very important in that these findings show that female CEOs' management styles are likely to generate new organizational practices advocating diversity, flexibility, and the development of a strong, collaborative corporate culture. The impact of these organizational practices is important, as they extend to the company environment (suppliers, clients, associations, etc.).

This research is not without **limitations**. Evidently, it was constrained by the very low number of female CEOs in very large companies, and by their inaccessibility in terms of collecting first-hand data. It must be acknowledged that, whereas the data gathered from media outlets did report face-to-face interviews, this is not the same as if the interviews had been carried out firsthand for the specific purposes of the study. Therefore, the analysis covers 860 public testimonies and perceptions published by female CEOs or specialized

press: the verbatim and interview reports are, thus, subject to many types of bias. The results are also limited by the absence of comparison between male and female CEOs. Moreover, the sample comprises only data pertaining to female CEOs of very large companies.

However, the increasing numbers of female CEOs observed in recent years make **new research streams** highly relevant. Ibarra (1992) and Cardador and Hill (2016) emphasize that gender in companies in the United States is a fundamental characteristic because it influences the trajectory of the actors and, thus, determines the positioning of individuals in institutional and organizational systems. Thus, a clearer understanding of the factors that may influence the career trajectory of CEOs is an important field of research (Cook and Glass, 2014; Khuruna, 2001).

Future research aimed at comparing the trajectories of male and female CEOs could distinguish between three trajectories:

- Internal promotion path: ascending the echelons in the company in which one is appointed CEO.
- External trajectory (appointment to the position of CEO of a company in which one has never worked before).
- Mixed trajectory with a preliminary step as a member of the board of directors of the company to which one is appointed CEO.

Another aim of future research would be to identify profiles of female CEOs according to their career progression. Future research could explore the management characteristics of smaller companies, because this could help SMEs improve their performance, particularly, with regard to innovation. An interesting avenue for future research would be to investigate whether the findings of this study would be reproduced in other national contexts. Future studies could also compare the career trajectories of male and female CEOs, focusing on the potential influence this can have on corporate innovation capacity.

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Appendices

Appendix 1: List of the 105 female CEOs studied in this research

1. Ahrendts, Angela (Burberry) 2. Alber, Laura J. (Williams-Sonoma) 3. Al-Suhaimi, Sarah (Riyadh National Commercial Bank) 4. Ayers, Andrea (Convergys) 5. Azeri, Gülsüm (Petrol Ofisi) 6. Barra, Mary (General Motors) 7. Bellettini, Francesca (Yves Saint Laurent) 8. Bhattacharya, Arundhati (State Bank of India) 9. Bresch, Heather (Mylan) 10. Brewer, Rosalind G. (Sam's Club) 11. Botín Ana (Banco Santander) 12. Bridgeland, Sally (BP Pension Trustees) 13. Bufano, Kathryn (Bon-Ton Stores) 14. Burns, Ursula M (Xerox) 15. Cafaro, Debra A. (Ventas) 16. Callahan Erdoes, Mary (JPMorgan Asset Management) 17. Cameron, Susan M. (Reynolds American) 18. Catz, Safra A. (Oracle) 19. Chiquet, Maureen (Chanel) 20. Cochran, Sandra (Cracker Barrel) 21. Cooper, Alison (Imperial Tobacco) 22. Courville, Isabelle (Banque Laurentienne du Canada) 23. Delly, Gayla (Benchmark Electronics) 24. Denahan, Wellington J. (Annaly Capital Management) 25. Dillon, Mary (Ulta Salon Cosmetics & Fragrance) 26. Doughtie, Lynne (KPMG U.S.) 27. Dressel, Melanie (Columbia Banking System) 28. Engelbert, Cathy (Deloitte LLP) 29. Ernotte, Delphine (France Télévisions) 30. Foulkes, Helena (CVS/pharmacy) 31. Fraser, Jane (Citigroup Latin America) 32. Garfield, Olivia (Severn Trent) 33. Gilmartin, MaryAnne (Forest City Ratner Cos) 34. Good, Lynn J. (Duke Energy) 35. Gordon, Ilene, (Ingredion) 36. Greene, Moya (Royal Mail, Britain) 37. Grossman, Mindy F. ('HSN) 38. Hart, Patti S (International Game Technology) 39. Harris, Kimberly (Puget Sound Energy) 40. Hewson, Marillyn A (Lockheed Martin) 41. Hinman, Jacqueline (CH2M Hill) 42. Hook, Lisa A (Neustar) 43. Jackson, Linda (Citroën) 44. Johnson, Abigail (Fidelity Investments) 45. Kampling, Patricia, (Alliant Energy) 46. Keane, Margaret (Synchrony Financial) 47. Kaplowitz, Marla (MEC North America) 48. Katz, Karen W. (Neiman Marcus Group) 49. Kelly, Gail (Westpac Group Australia) 50. Kindler, Lizanne (Talbots) 51. Kochhar, Chanda (ICICI Bank India) 52. Krill, Kay (Ann) 53. Kullman Ellen J. (DuPont) 54. Lau, Constance H. (Hawaiian Electric Industries) 55. Loeb sack, Grita (Kering Luxury - Couture & Leather Goods' Emerging Brands) 56. Lubel (Bowers) Kimberly (CST Brands) 57. Lundgren, Tamara L. (Schnitzer Steel Industries) 58. Martin, Lauralee E. (HCP) 59. Martore, Gracia C. (TEGNA) 60. Mayer, Marissa (Yahoo) 61. Mazzeella, Kathleen M. (Graybar Electric) 62. McCall, Carolyn (Easy Jet) 63. McCoy Sherilyn (Avon Products) 64. McReynolds, Judy (Arkansas Best) 65. Meyrowitz, Carol (The TJX Companies) 66. Miles, Amy (Regal Entertainment) 67. Mooney, Beth E. (Keycorp) 68. Morrison Denise M. (Campbell Soup) 69. Mulligan, Deanna M. (Guardian Life Ins. Co. of America) 70. Nicholson, Pam, (Enterprise Holdings) 71. Nooyi, Indra (PepsiCo) 72. Novakovic, Phebe N. (General Dynamics)

73. Olshan, Andrea, (Olshan Properties)
 74. Palmer, Sheryl (Taylor Morrison Home)
 75. Peng, Lucy (Alibaba Small & Micro Financial Services Group)
 76. Price John, Sharon (Build-A-Bear Workshop)
 77. Pleshakova, Olga (Transaero)
 78. Ramos, Denise, (ITT)
 79. Reed, Debra L. (Sempra Energy)
 80. Rentler, Barbara (Ross Stores)
 81. Rometty, Virginia M (IBM)
 82. Rosenfeld, Irene (Mondelez International)
 83. Savarese Dorothy (Cape Cod Five Cents Savings Bank)
 84. Schroeder, Patricia (Association of American Publishers)
 85. Sen, Laura (BJ's Wholesale Club)
 86. Seon-Joo Kwon (Industrial Bank of Korea)
 87. Sharma, Shikha (Axis Bank)
 88. Shimpko, Chie (Nomura)
 89. Smith, Elizabeth (Bloomin' Brands)
 90. Sock Koong, Chua (Singapore Telecommunications)
 91. Story, Susan N. (American Water Works Company)
 92. Su, Lisa (Advanced Micro Devices)
 93. Sullivan, Diane M. (Brown Shoe)
 94. Tighe, Mary Ann (CBRE)
 95. Taylor, Cindy B., (Oil States International)
 96. Turney, Sharen Jester (Victoria's Secret)
 97. Vasudeva, Nishi (Hindustan Petroleum)
 98. Via, LuAnn (Christopher & Banks)
 99. Wang, Vera (Bridal House)
 100. Whitman, Meg (Hewlett-Packard)
 101. Wilderotter, Mary Agnes (Frontier Communications)
 102. Woertz, Patricia A. (Archer Daniels Midland)
 103. Wojcicki, Susan (YouTube)
 104. Yastine, Barbara ('Ally Bank)
 105. Yellen, Janet (Fed)

Appendix 2: Series of NVIVO

Code	Characteristics	Sources	References
1	Organizational context		
101	Country of Company Head Office (Tuliao and Chen, 2017)	105	105
102	Activity Sector (Karami et al, 2006)	105	105
103	Type of Industry (Karami et al, 2006)	105	105
2	Organizational practices		
201	Criticism and Controversy (Carli, 2001)	23	72
202	Execution of Routines and Practices (Feldman, 2003)	28	42
203	Changes in Internal Organizational Processes (Bolton et al, 2011)	28	48
204	Gender Stereotype (Schein, 1973; Eagly and Karau, 2002; De Bruijn and Volman, 2000; Matsa and Miller, 2011)	20	39
205	Mentoring (Matsa and Miller, 2011)	27	44
3	CEO personal characteristics		
301	Year of Birth (Hambrick and Mason, 1984)	105	105
302	Marital Status (Hurley and Choudhary, 2016)	80	85
303	Number of Children (Hurley and Choudhary, 2016)	67	67
304	Nationality (Hambrick, 2007; Tuliao and Chen, 2017)	105	105
305	Level of Education (Hambrick and Mason, 1984)	101	101
306	Management experience (Manner, 2010)	87	139
4	CEO professional practices		
401	Career Aspirations (Carli, 2001)	46	73
402	Understanding of Self-Confidence (Faccio et al, 2016)	31	53
403	Management Style (Dezso and Ross, 2008)	47	113
404	Value Placed on Work (Carli, 2001)	26	43
405	Symbolic Influence (Jarzabkowski et al, 2009)	34	56
406	Organizing Strategies (Brooks, 2002)	59	100
407	General Interest Activities (Jarzabkowski, 2004)	48	71
408	Support for Innovation (Glass and Cook, 2017)	45	60
409	Attitude Towards Risk (Faccio et al, 2016)	30	35
410	Prestige (Galema et al, 2012)	66	100