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# Gender diverse boards and firm performance: the effect of gender quota law

Nargis Akhtar

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Spécialité: *Sciences de Gestion*

Par

**Nargis AKHTAR**

**Gender diverse boards and firm performance: The effect of gender quota law**

**Diversité du genre dans le conseil d'administration et performance de l'entreprise: L'effet de la loi sur les quotas de genre**

Thèse présentée et soutenue à Le Mans, le 06 Mai 2022

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*To My Beloved Family*

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# Gender diverse boards and firm performance: The effect of gender quota law

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## *ABSTRACT*

Policy-makers around the world are introducing board gender quotas to push female board directorship. The French parliament also enacted the “Cope-Zimmerman Law” in 2011 to ensure at least 40% female board members on French corporate boards by 2017. This dissertation aims to shed light on the compliance with this law by French listed firms and to investigate its effect on their accounting and market-based performance (i.e., ROA and Tobin’s Q, respectively). We draw our sample by taking all non-financial firms listed on SBF 120 index from 2001 to 2019. To appropriately counter the problem of endogeneity, we use Propensity Score Matching (PSM) approach and system GMM regression. We first show that French firms have achieved the desired level of female directorship (i.e. 40% female board members). While examining the trend of female directorship, we find that French firms tend to appoint more female directors on monitoring positions (i.e., independent board membership and audit committee membership) compared to female inside directors. These findings refute the occurrence of the golden skirt phenomenon and/or multi-directorship in the aftermath of mandatory gender quota legislation. The multivariate analyses show that board gender diversity positively affects ROA, whereas it negatively affects Tobin’s Q. More importantly, we use a difference-in-differences approach to examine the marginal effects of Cope-Zimmerman law. In the post-quota period, the link between female directorship and ROA becomes even stronger, whereas the negative coefficient on Tobin’s Q turns positive. Further, our investigation reveals that female directors in monitoring positions improve both ROA and Tobin’s Q. However, female inside directors reduce firm profitability, and this relationship is even strengthened in the post-quota period. Finally, we perform additional analysis by including attributes of female directors in our regression model and show that our results remain unchanged. Overall the findings presented in this dissertation suggest that mandatory gender quota legislation has been successful in breaking the glass ceiling and positional gender segregation by going beyond token presence of female directors in French context. These findings contribute to the current debate on mandatory board gender quota legislation by showing that in pursuit of enhancing board gender diversity, female directors should be appointed on key board positions to benefit corporate stakeholders.

**Keywords:** Board gender diversity, gender quota law, firm performance



# La diversité du genre aux conseils d'administration et la performance d'entreprise: L'effet de la loi sur les quotas de genre

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## RÉSUMÉ

Le parlement français a promulgué la «loi Cope-Zimmerman» en 2011 pour assurer au moins 40% de femmes dans les conseils d'administration des sociétés françaises d'ici 2017. Cette thèse vise à mettre l'accent sur le respect de cette loi par les entreprises cotées françaises et à enquêter sur ses effets sur la performance comptable et boursière (mesurée par le ROA et le Q de Tobin, respectivement). Notre échantillon est composé d'entreprises non financières cotées appartenant à l'indice SBF 120 sur la période allant de 2001 à 2019. Pour appréhender de manière appropriée le problème d'endogénéité, nous utilisons l'approche du Propensity Score Matching (PSM) et le système de régression GMM. L'examen de la représentation féminine dans les conseils d'administration montre que les entreprises françaises ont tendance à nommer plus de femmes administrateurs aux postes susceptibles d'exercer d'une manière efficace une fonction de contrôle des dirigeants (c.-à-d. Membre indépendant du conseil d'administration et membre du comité d'audit) par rapport aux femmes administrateurs internes. Les analyses multivariées montrent que la diversité du genre dans les conseils d'administration affecte positivement le ROA, alors qu'elle affecte négativement le Q. de Tobin. Plus important encore, nous utilisons l'approche de la différence des différences pour examiner les effets marginaux de la loi Cope-Zimmerman. Dans la période post-quota, le lien entre la proportion des femmes au CA et le ROA devient encore plus fort, tandis que le coefficient négatif du Q de Tobin devient positif. En outre, notre étude révèle que les femmes occupant des postes de surveillance améliorent à la fois le ROA et le Q de Tobin. Cependant, les femmes administrateurs internes réduisent la rentabilité de l'entreprise et cette relation est même renforcée après la période de quota. Enfin, nous effectuons une analyse supplémentaire en incluant les attributs des femmes administratrices dans notre modèle de régression et montrons que nos résultats restent inchangés. Dans l'ensemble, les résultats présentés dans cette thèse suggèrent que la législation sur les quotas obligatoires de genre a réussi à briser le plafond de verre et la ségrégation entre les genres en allant au-delà de la présence symbolique de femmes dans le contexte français. Ces conclusions font actuellement débat sur la législation sur les quotas obligatoires de genre dans les conseils d'administration en montrant que, dans le but d'améliorer la diversité de genre dans les conseils d'administration, des femmes administrateurs devraient être nommées à des postes clés au sein du conseil afin de pouvoir exercer une influence significative sur la performance des entreprises.

**Mots-clés:** diversité du genre dans les conseils d'administration – loi sur les quotas de genre – performance des entreprises.

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## **Chapter 1: Introduction**

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The issue of gender diversity on corporate boards has received mounting attention from stakeholders, policymakers and academia in the last two decades. Despite the theoretical desirability of gender equality and equal opportunity policies, female representation on corporate boards remained significantly low. In 2006, the European Professional Women's Network (EPWN) found that there is an average of 8.5% female directors in the top 300 European companies. Whereas during the same year, Catalyst reported that in the United States Fortune 500 have an average of 14.7% female members on their boards. The share of female board directors was 13.3 % in the UK, 12.3% in France, 4.5% in Italy and 9.5% in Spain on average (OECD, 2010). Policy makers around the world have responded by taking initiatives in the form of mandatory or voluntary approaches aimed at enhancing the gender diversity on corporate boards by increasing the proportion of female directors. For instance, 32 countries introduced boardroom gender diversity reforms in the form of quotas or recommendations in governance codes between 2008 and 2015 (Adams, 2016). The European commission and its members (at state level) have introduced boardroom gender quota reforms to ensure female access to the upper echelons of corporate worlds. Twelve member states of the European Union have established board gender quotas; five states have introduced mandatory quotas backed with penalties (France, Belgium, Italy Germany and Portugal); two states have implemented voluntary quotas without sanctions (the Netherlands and Spain); and five states have introduced regulations only for public firms (Austria, Denmark, Finland, Greece and Slovenia). Thus, improvement of gender diversity on corporate boards is also a part of the global theme of promoting gender equality in the society.

## *Chapter 1: Introduction*

The renewed interest in the context of female participation in boardrooms has been underpinned in the fiscal plunges of the last decades (Brahma, Nwafor, & Boateng, 2020; Joecks, Pull, & Vetter, 2013; Perryman, Fernando, & Tripathy, 2016). The corporate catastrophes of the past decade and the economic crunch of 2008 have resulted towards a much more contemplative approach regarding board effectiveness. The prominent financial reporting scams related to European (e.g., Parmalat) and U.S companies (e.g., Enron, Tyco & WorldCom) put forward serious questions regarding the effectiveness of boards of directors in executing monitoring duties. Such corporate scams also raised concerns for the media and the general public regarding the inner workings of corporate boards. For instance, following the failure of Lehman Brothers, the media such as Wall Street Journal and Business Week raised concerns by asking, “Where was Lehman’s Board?” (Berman, 2008). Governance reforms such as the Sarbanes-Oxley legislation (in the US) and the Higgs Review (in the UK) drew the attention of the policymakers, corporate stakeholders, and academics towards the composition of corporate boards of directors. In response to the scams, the Higgs and Tyson report in 2003 suggested that boards should increase their pool of candidates and cast a wider net for the recruitment of board of directors. While trying to answer the questions about board effectiveness and performance improvement, academic scholars put emphasis on board gender diversity (Daily & Dalton, 2003). Researchers have found that in gender diverse boards decision-making process is improved by the diverse opinions and viewpoints. These varying ideas help to evaluate the issues by generating various options that improve the quality of decision (Chen, Liu, & Tjosvold, 2005; Daily & Dalton, 2003).

Diversity is attributed to differences and when it comes to gender diversity in the board of directors, it is defined as a varied mix of attributes, abilities, and expertise

that distinct members bring to the board by the virtue of their gender (Van der Walt & Ingley, 2003). As such, diversity is valued and signifies as a strategic corporate concern (Campbell & Mínguez-Vera, 2008). Diversity is broadly classified into two distinctive clusters: demographic and statutory (Gull, Nekhili, & Nagati, 2017; Milliken & Martins, 1996; Pelled, 1996). Demographic diversity entails observable features such as gender, age, and academic qualification, while statutory diversity refers to non-observable characteristics such as knowledge, expertise, and intellectual abilities of individuals. Extant literature describes that one of the latest boardroom trends to deal with issues of corporate governance is the addition of different types of diversity in the boardroom (Hillman, Cannella, & Harris, 2002). Supporters of diversity argue that diversity leads to heterogeneous perspectives and problem-solving approaches, an improvement in communication, and a more detailed critical analysis of issues that help in better decision making.

Policy makers provide justification to enhance the proportion of female directors on corporate boards on the basis of business case argument (Bilimoria, 2000). Female boardroom participation enhances the intellectual resources by incorporating a wider pool of human capital that both provides firms competitive edge and also has implications for performance (Dezsö & Ross, 2012). The business case argument is based on “how and why” of integration of female directors on corporate boards to enhance performance (Cox, 1991; Van der Walt & Ingley, 2003). It also depends on realizing the importance of diversity in that there are significant differences in the abilities of women and men. Additionally, the business case argument emphasizes that females signify almost half of the proportion in society, and their incorporation in the workplace will therefore lead towards proper utilization of available resources (Adams & Flynn, 2005; Wang & Clift, 2009). Two directives of the European Commission



(2012 a & b)<sup>1</sup> validate the business case argument for boardroom gender diversity by claiming that gender diversity on corporate boards will lead to proper utilization of human resources that will increase sustainable economic development.

While the importance of women on corporate boards has been long recognized, female gains in terms of board directorship have not been significant (Arfken, Bellar, & Helms, 2004; Daily, Certo, & Dalton, 1999). Various studies highlighted that the issues encountered by females candidates while applying for board level positions are stereotypes (Fitzsimmons, 2012), glass ceilings, (Arfken et al., 2004; Ferreira, 2010; (Terjesen et al., 2009), vertical segregation (Poggio, 2010), and gender discrimination (Broome, 2008; Rebérioux & Roudaut, 2016). Along with these, there are numerous other hurdles in the selection of women on boards. For example, various authors have identified the selection criteria for directors were marked with traditional values and strong connections to the relevant “network of men,” as well as the prevalence of “a certain monolithism” (uncertain monolithism) (Burke, 2000; Chandler, 2016; Holton 2000). These ambiguous recruitment processes coupled with rigorous governance experience requirements act as scrutinizing processes for female candidates. In fact, all of these processes signal towards the existence of a systematic gender bias in the selection of top-level executives. This scrutiny is even stronger for females than for males (Hillman et al., 2000; Singh et al., 2008). On the other hand, token presence of female directors is reported in many countries, who serve only as corporate board members (Daily & Dalton, 2003; Kanter, 1977; Terjesen, Sealy & Singh, 2009). In this

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<sup>1</sup> The directive of the European Commission (2012a), described as: “the proposed directive will lead to breaking down the barriers that women face when aiming for board positions and to improved corporate governance as well as enhanced company performance.” Additionally, the benefits obtained by gender diversity are not limited to the firms that implement it, rather its positive effects are supposed to spread to all dimensions of society. The European Commission (2012b) directive states: “the proposed directive will lead to breaking down the barriers that women face when aiming for board positions and to improved corporate governance as well as enhanced company performance.”

vein, researchers have identified a “critical mass” of at least three members of any gender group for efficient and positive contribution (Kanter, 1977; Konrad et al., 2008).

The dearth of female representation on corporate boards has also garnered media and public attention (Labelle, Francoeur, & Lakhali, 2015). After the failure of soft approaches<sup>2</sup> to accelerate the advancement of female directors to top corporate positions, legal actions seem to be an appealing option for policy makers and regulators (Ross-Smith & Bridge, 2008). Similarly, initiatives taken at private level such as the European Professional Women’s Network (EPWN) and the Canadian Board Diversity Council have pressurized governments to take initiatives to enhance the proportion of female directors (Labelle et al., 2015). Given the intense pressure and slow response by firms, the countries around the world have taken initiative to enhance board gender diversity in the form of legislations for gender quotas or recommendations in the corporate code of governance. In similar sequence, French government passed the Cope-Zimmerman law in January 2011, which required French listed firms to ensure 40% of female directors on their corporate boards by 2017, with a transitional threshold of 20% in 2014.<sup>3</sup>

More recent research is now evaluating the relative effectiveness of board gender diversity reforms on various aspects of organization. A number of studies investigate the effectiveness of mandatory board gender quota legislation in the French context. Singh et al. (2015) conducted research to anticipate the impact of leaning quota

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<sup>2</sup> In 2002, after observing a 10% proportion of female directors on board, the Norwegian government ended its laissez-faire approach. A voluntary regulation was introduced for listed firms to ensure 40% proportion of female directors on the board by July 2005. However, the proportion rose only up to 24% by July 2005. After the failure of voluntary efforts, a mandatory board gender quota was introduced and backed with penalties in case of non-compliance in January 2006, with a deadline of January 2008. As a result, the required proportion was achieved in April, 2008 (Oslen, Schone & Verner, 2013).

<sup>3</sup> All the French firms with more than 500 employees and 50 million of revenue during three subsequent years were required to conform to this law.

legislation on board membership from 2008 to 2010 and reported a positive response by the firms before the anticipated deadline; Ferreira, Ginglinger, Laguna, and Skalli (2017) analyzed the effect of board gender quotas on the corporate board director's market from 2003-2014; Rebérioux and Roudaut, (2016) investigated the situation of female directors within French boards following the adoption of a board-level gender quota for a period 2006-2014; Nekhili et al. (2020) studied the moderating impact of gender quota law on audit fees of gender diverse boards; and Nekhili et al. (2021) investigated the effect of board gender quotas on related party transactions (RPT). However, only two studies investigate the effect of the gender quota legislation on firm performance (Comi, Grasseni, Origo, & Pagani, 2019; Sabatier, 2015). With this in mind, this dissertation aims to study the moderating effect of mandatory gender quota legislation on the link between female directorship and firm performance in French context. We seek to contribute to the literature on corporate governance, particularly in the emergent field of literature that focuses on mandatory board gender quota reforms affecting composition of corporate boards by providing insights from French context, as it has remained relatively unexamined so far.

### *Theories of board gender diversity*

A review of existing literature demonstrates that theoretical rationalization of board gender diversity is embedded in four theories: agency theory, human capital theory, resource dependency theory, and institutional theory.

#### *Agency theory*

Agency theory revolves around the association between shareholders and managers. This theory states that shareholders, directors, and managers are associated to each other as principal and agents; directors are assigned to monitor the activities of

## *Chapter 1: Introduction*

management and to avoid any conflicts between principal and agents (Fama & Jensen, 1983; Jensen & Meckling, 1976). According to this theory, outside and inside directors are different in terms of the duties assigned to them. Normally, outside (independent) directors are assigned the monitoring task and it is expected that they will avoid teaming up with inside directors to expropriate shareholders because outside directors are conscious about their reputation. In turn, it is expected that they will secure the shareholder interest. In the light of this theory, it is argued that presence of female directors can improve the monitoring ability of the board. Females are found more attentive in questioning unethical business practices (Franke, Crown, & Spake, 1997) as well as inclined to follow stricter moral principles (Pan & Sparks, 2012). Prior evidence shows that firms having a greater number of female directors organize more board meetings, have higher attendance rates and thus involve in strict monitoring of their managers (Adams & Ferreira, 2009). Therefore, board gender diversity serves as an active tool for ensuring the effective functioning of management through the inclusion of female directors (Carter, Simkins, & Simpson, 2003).

### *Human capital theory*

According to the theory of human capital, an individual characteristic (e.g., formal education and professional expertise) plays an important role. Becker (1964) maintains that distinctive knowledge, skills, and abilities of individuals are valuable for their firms. In the context of corporate boards, each director as a person is different and holds his/her own set of human resources as of social relations, professional wisdom, experience, and linkages which they take with them (Hillman et al., 2007). The set of individual human resources are valuable both for boards as well as for businesses (Kesner, 1988). In this context, this theory argues that involvement of female directors on corporate boards is crucial, as they carry a diverse set of abilities necessary for the

## *Chapter 1: Introduction*

functioning of the board that is different from their male collaborators. Singh, Terjesen, and Vinnicombe (2008) provide empirical support to this argument by showing that the human capital profiles of female directors bring international diversity. Additionally, Daily, Certo, and Dalton (1999) report that most female directors have working experience of small companies as members of their boards. Similarly, Peterson and Philpot (2007) state that female directors are equally competent and have advanced educational degrees compared to their male counterparts in Fortune 500 firms. As there is an increasing trend of females getting higher educational degrees, females are increasingly appointed on boards compared to males due to their higher qualifications (Hillman et al., 2002). Becker (1998) report that educational level of board members is directly related to the productivity of the firms

### *Resource dependence theory*

The theory of resource dependency elaborates the link between organization and external environment. This theory states that organizations are dependent upon the volatility of the exterior environmental elements (Pfeffer, 1972; Pfeffer & Salancik, 2003). In such an environment, corporate boards are tasked with the responsibility to curtail these uncertainties without increasing the transaction costs. With regard to board gender diversity, this theory claims that female directors comprise a distinctive set of resources like their knowledge, skills, abilities, esteem, and professional linkages that are helpful in mitigating uncertainties arising from dependency on the factors that are uncontrolled and exist in an external environment. Pfeffer and Salancik (2003) claim that board directors also require interpersonal skills in addition to human skills. As females out-perform males in interpersonal skills, the incorporation of females to the corporate boards as board of director improves the capability of board members in terms of skills they have. Indeed, the decision to hire females on a board is dependent

on the competences they hold (Nekhili & Gatfaoui, 2013; Peterson & Philpot, 2007). In this vein, resource dependence theory suggests that gender diversity in boardroom increases firm performance by benefiting from the skills and intellectual ability of diverse resources.

*Institutional theory*

Institutional theory states that organizations are driven by the desire to gain legitimacy. This is to say that it is necessary for an organization to get legitimate status in the institutional environment in which it operates. Organizations can obtain legitimacy by complying with the laws (Ashforth & Gibbs, 1990; Meyer & Rowan, 1977). Institutional theory describes that organizations conform to institutional pressures by reproduction or imitation of structures and cultures in order to gain legitimacy. This desire for legitimacy consequently creates similarity and isomorphism among organizations. DiMaggio & Powell (1983) states that there are three types of institutional pressures, namely coercive, mimetic and normative. Coercive pressures are exerted by the society, other institutions, and regulators; society exerts coercive pressure in the form of societal norms regarding desired actions by the organizations, other institutions guide organizations to behave in certain ways to get resources, and regulatory institutions outline required behaviors needed for legitimacy. Mimetic pressures set standards for other organizations by copying behaviors from successful organizations in order to avoid environmental uncertainty. Normative pressures are guided by the professional values and are communicated through shared visions and professional training within the organization. These institutional directions provide homogenous rules that lead towards a uniform organizational structure in a particular field (e.g., commerce, financial institutions, and non-financial institutions). In the context of recent regulations on boardroom gender diversity, organizations can create

both a positive image and legitimate status by appointing female directors on board as gender diversity on corporate boards is required by policy makers and desired by stakeholders (Hillman et al., 2007). Moreover, the presence of female directors represents fair practices for both genders to be promoted to senior positions and enhance motivation. Additionally, enhancing gender diversity on board provides the organization a competitive edge over opponents and helps maintain good relations with the institutional shareholders (Carter et al., 2003).

*Board gender quotas and relevant literature:*

Boardroom diversity policies have taken various forms, ranging from quotas (either mandatory or voluntary) to soft initiatives such as governance code modifications and disclosure requirements (Adams, 2016; Klettner, Clarke, & Boersma, 2016; Spender, 2012).<sup>4</sup> Quotas are the authorized percentage or number of each gender group required by industry regulators or governments with a mechanism for implementation outlined (Sojo, Wood, Wood, & Wheeler, 2016). The rationale for percentage or number of each gender group specified in the quota regulations is to ensure the “critical mass” of each gender group necessary to make a positive contribution (Singh et al., 2015). Though controversial, board gender quotas are introduced as a redress mechanism to the long prevailing slow accession of females to top corporate positions. The opponents of quotas claim that they violate meritocracy (Holzer & Neumark, 2000), as mandated requirements will create a huge demand of female directors that can create a supply-side shortage of qualified females (Ahern & Dittmar, 2012). Still, gender quotas are advocated as the “ultimate option” to achieve

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<sup>4</sup> A detail of gender diversity initiatives introduced in European countries is provided in appendix 1.

gender balance in corporate boards when voluntary efforts to promote gender diversity failed (Grosvold & Brammer, 2011). Boardroom gender quotas can be introduced in the form of voluntary or mandatory quotas. Voluntary quotas aim at gradually improving the proportion of female board members through incremental changes without sanctions. Such approaches have been implemented by the Netherlands, Spain and Austria. The underlying intention behind voluntary quotas is to create a shared vision by inviting the input of organizations and other key actors to motivate them and accelerate the process of cultural change (Klettner et al., 2016; Spender, 2012). The supporters of soft approach argue that mandatory compliance may lead to the appointment of female directors as “quota-filling board members” without having sufficient knowledge and expertise, hence making no significant contribution to board functioning (Casey, Skibnes, & Pringle, 2011). On the other hand, opponents of soft approaches are not convinced by the idea of shared aspirations and/or the speed of change, and they claim that mandatory action is indispensable for bringing change. Thus, the mandatory reforms are introduced as the “ultimate” option after failure of voluntary efforts to increase female presence on boards (Grosvold & Brammer, 2011). Norway pioneered the mandatory quota initiative after failure of a voluntary approach by implementing a mandatory boardroom gender quota of 40% female directors for all the registered firms in 2003. Inspired by the Norwegian experience, other European countries have also used mandatory approaches for implementing board gender quotas. With objectives to achieve boardroom gender diversity between 30 and 50 percent female board members, France, Italy, Germany and Belgium adopted mandatory gender quotas for corporate boards. More recent research is now evaluating the relative effectiveness of both approaches and debate is open in the field of economics and finance (Adams et al., 2015; Terjesen, Aguilera, & Lorenz, 2015).



*Female directorship and firm performance*

The issue of gender diversity on corporate boards and its link with performance of firms has been largely investigated and still debatable due to mixed results. One stream of literature exhibits a positive relationship between gender diversity on corporate boards and performance of the firm (Ahmadi & Bouri, 2017; Bennouri, Chtioui, Nagati, & Nekhili, 2018; Campbell & Mínguez-Vera, 2008; Erhardt, Werbel, & Shrader, 2003; Liu et al., 2014; Post & Byron, 2015). While another stream of literature report an inverse link between board gender diversity and performance of the firm (Adams & Ferreira, 2009, DiTomaso et al., 2007; Herring, 2009; Joecks et al., 2013). However, some studies report no significant relation between gender diversity on corporate boards and performance of the firms (Carter, D'Souza, Simkins, & Simpson, 2010; Chapple & Humphrey, 2014; Rose, 2007).

*Female directorship, board gender quotas and firm performance*

Recently, regulatory and academic research is substantially focusing on exploring the role of gender diversity on corporate boards and corporate governance especially after the promulgation of legislations regarding corporate board quotas. Existing empirical evidence on board gender quotas is mostly based on Norwegian experience, whereas some scholars have scrutinized the issue of board gender quota in the context of other European countries (e.g., (Ahern & Dittmar, 2012; Bøhren & Staubo, 2014; Comi et al., 2019; Eckbo, Nygaard, & Thorburn, 2016; Lucas-Pérez et al., 2015; Matsa & Miller, 2013; Nygaard, 2011; Reguera-Alvarado, Fuentes, & Laffarga, 2017; Sabatier, 2015). Studies examining the impact of board gender quota regulation on the performance of firms provide mixed results across different countries. Ahern and Dittmar, 2012, Matsa and Miller (2013) and Voß (2015) document a

negative impact of mandatory gender quota legislation on market performance of Norwegian firms. In contrast, Ferrari, Ferraro, Profeta, and Pronzato (2021) report positive association between mandatory legislation for gender quota legislation for corporate boards and performance of the firms in Italy. In Spain, positive results of board gender diversity (enhanced by soft quota reforms) and economic performance have also been reported (Reguera-Alvarado, de Fuentes, & Laffarga, 2017; Lucas-Pérez et al., 2015). Fedorets, Gibert, and Burow (2019) report no effect of gender quota law on firm financial performance (ROA, ROE and EBTI) in the context of Germany.

Extant research has highlighted that political initiatives such as corporate board gender quotas are highly contextualized and embedded in particular regulatory environments. Moreover, the legislated procedure and requirement also affect the potential of the law to bring change (Lépinard, 2018; Paxton & Hughes, 2015; Schwindt-Bayer, 2009). Furthermore, there is a paucity of empirical research from various aspects of corporate board quotas in the European context (Hughes, Paxton, & Krook, 2017). The mixed empirical evidence across different countries' results highlights the significant role of institutional setting that may influence the effectiveness of regulations focusing on corporate board gender diversity. In this regard, the focus of the current dissertation is to investigate the effect of mandatory gender quota legislation for corporate boards on the performance of the firms in the context of France.

There is a dearth of studies in the French context concerning the effectiveness of implemented gender quota legislation. In this respect, Singh, Point, and Moulin (2015) conducted research to anticipate the impact of leaning quota legislation on board membership from 2008 to 2010 and reported a positive response by the firms before the anticipated deadline. Ferreira, Ginglinger, Laguna, and Skalli (2017) analyzed the

## *Chapter 1: Introduction*

impact of board gender quotas on the board director's market from 2003-2014. Rebérioux and Roudaut (2016) investigated the situation of female directors within French boards after the implementation of a mandatory gender quota for a period 2006-2014. Nekhili, Gull, Chtioui and Radhouane (2020) studied the impact of gender quota legislation on audit fees. They report increased gender diversity on the audit committee by the virtue of gender quota legislation has increased audit efficiency and resulted in lowering the audit fees. Nekhili, Bennouri and Nagati, (2021) investigate the effect of gender diversity increased by gender quota legislation on related party transactions (RPT) and report a negative effect of female directors on RPTs.

The motivation for this dissertation is drawn from the conflicting evidence regarding the effect of boardroom gender quota reforms on the performance of the firms. So far, only two studies investigate the initial impact of gender quota law in the French setting. Sabatier (2015) studied the initial impact of gender diversity reforms from 2008-2012 on a sample of CAC40-listed French companies. Using a method of instrument panel regression, the author reports a positive impact of diversity reforms on the performance of firms and recommends that gender diversity helps firms improve performance by removing inefficiencies. However, Comi et al. (2019) use a dataset from 2004 to 2014 and report a negative association between gender diversity reforms and productivity of French firms. These contrasting findings in French context call for an in-depth analysis of French boardroom gender diversity reforms. In addition, the aforementioned evidence is based on a time period when French firms were only required to appoint 20% female board members (i.e., 2014), and as per our knowledge, there is no study that scrutinizes the effect of the Cope-Zimmerman law since its full enforcement in 2017. Another motivation for this dissertation is drawn from the fact that the French institutional setting is important to study due to its distinctive features.

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For instance, a key distinctive feature of the French institutional setting is the civil law-based system marked with weak investor protection (La Porta, Lopezde-Silanes & Shleifer, 1999). Several previous studies in the French context discuss how the lack of appropriate procedures for the protection of minority shareholder interest leads to greater chances of their expropriation (e.g., Boubaker & Labégorre, 2008; Nekhili, Chakroun, & Chtioui, 2018). Furthermore, another related aspect of the French context is the existence of family ownership and separation of ownership and management (Faccio & Lang, 2002). Boubaker and Labégorre (2008) highlight that family members influence the appointment process of directors in family-controlled firms by selecting the officials from their networks, thus ultimately serving in the interest of controlling families. In this situation, the prime matter of concern is to safeguard the interest of minority shareholders. In particular, Post & Byron (2015) highlight that the extent to which shareholder interests are protected and the level of gender equality prevailing in a specific institutional environment are circumstantial factors and likely conditions that determine the way how gender diversity on corporate boards effects firm-level outcomes.

Nekhili and Gatfaoui (2013) reported the existence of a double glass-ceiling dilemma for female appointment for board level positions in the French context. Rebérioux and Roudaut (2016) also reported the existence of positional gender segregation (an inner glass ceiling, particularly with regard to monitoring committees) while examining the position assigned to female directors on board after the partial enactment of mandatory gender quota legislation for corporate boards in France. They examined the role assigned to female directors measured by their fees on a sample of firms listed on SBF120 index over the period 2006-2014. The authors state that despite the gender quota legislation, females are still not key players inside French corporate

boards and further call for an in-depth analysis after the promulgation of gender quota legislation.

Finally, in the context of mandatory gender quota legislation, scholars have expressed concerns regarding the appointment of token female directors who are unqualified due to supply side shortage of qualified females (Adams & Kirchmaier, 2015) and the appointment of such female directors who occupy multiple board-directorships labeled as “Golden Skirts” (Seierstad & Opsahl, 2011). In the French context, the implementation of mandatory gender quota legislation is a promising theme for evaluating the supply of qualified female directors (Singh et al., 2015) as well as the attributes of appointed female directors in compliance with a mandatory gender quota law (Bennouri et al., 2018).

### *Objectives*

In the light of the arguments cited above, the first objective of our study is to scrutinize the impact of female presence on accounting and market-based measures of firm performance (ROA and Tobin’s Q) in France in the context of mandatory board gender quota legislation. Specifically, we aim to investigate the moderating effect of female directors on firm performance after the promulgation of mandatory board gender quota legislation. Furthermore, the aim of current dissertations is also to examine the effectiveness of mandatory reform with regard to target achievement (i.e. whether required percentage is achieved or not). Further, prior research has not examined the effect of gender diversity reforms on the inner working of the board. Recent regulatory and institutional pressures focus on female directors’ appointment on boards, but these measures neglect the participation of appointed female directors in the mechanism of governance. Explicitly, in the light of the evidence of double glass ceiling and positional gender segregation (Nekhili & Gatfaoui, 2013; Rebérioux &

Roudaut, 2016), the objective of this study is to investigate the positions assigned to female directors on corporate boards such as inside directorship (working on board only), independent directorship and audit committee member. We aim to separately investigate their impact on the firm accounting and market based performance. Additionally, keeping in mind the potential fear of multi-directorship associated with legislative approach or the appointment of unqualified female due to supply side shortage of qualified female (Adams & Kirchmaier, 2015) and the emergence of “Golden Skirts” (few female directors occupy multiple board-memberships) in Norway (Seierstad & Opsahl, 2011), we aim to shed light on the attributes (nationality, education, experience, multi-directorship and tenure) of female directors appointed on board in compliance with mandatory board gender quota.

### *Methodology*

Existing literature has identified that while examining the board gender diversity and firm performance relationship, researchers should carefully consider the issue of endogeneity (Adams, 2016; Adams & Ferreira, 2009). For instance, a recent study conducted by Eckbo et al. (2016) contested the validity of negative results of Ahern and Dittmar (2012) regarding the effectiveness of gender quota legislation and illustrate that the inverse market reaction turned non-significant by using a more robust analysis that appropriately address the problem of endogeneity. Despite presenting a “business case” argument for gender diversity by consultancies (e.g., Catalyst, 2007; McKinsey, 2007), researchers are hesitant to rely on the results because they do not control for endogeneity concerns (Adams, 2016). The issue of endogeneity may arise due to various factors such as selection problem, unobservable heterogeneity, simultaneity, or measurement error. In order to mitigate the issue of endogeneity, we first control for selection bias by performing Propensity Score Matching (PSM)

## *Chapter 1: Introduction*

between firms with higher than median proportion of female directors and firms with lower than median proportion of female directors (Rosenbaum & Rubin, 1983). Second, we applied the system GMM (Generalized Method of Moments) estimation technique as our major estimation procedure to cater the issue of endogeneity arising from different sources (Blundell & Bond, 1998). This methodology helps to obtain consistent results and prevents biases arising from endogeneity concerns (Roodman, 2009; Wintoki, Linck, & Netter, 2012). Importantly, we also used the difference-in-differences approach to investigate the marginal impact of gender diversity on corporate boards on firm performance in the post-quota period.

### *Thesis structure*

This thesis comprises of five chapters. In the first chapter, brief introduction of the study is provided. In the second chapter, an overview of gender diversity initiatives around the world, quota laws in general, and the application of Cope-Zimmerman law on the corporate boards of French listed firms is discussed. In the light of theories of board gender diversity and relevant literature, we also formulate hypotheses for this study. The third chapter presents the research methodology with details regarding sample selection, sources of data, variables measurement, and models used for the analyses. The fourth chapter comprises of the descriptive results, multivariate results, and additional analysis. In the final chapter, we present a discussion and conclusion along with contributions, implications, and limitations of this study. At the end of this thesis, we also provide a short summary of our study in the French language.

## Chapter 2: Literature review and hypothesis development

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### An overview of gender diversity initiatives

European countries have a long history of policy initiatives towards their effort to achieve gender equality, starting with suffrage (the right to vote) and subsequently introducing the equality legislation, equal pay, and equality rights in the political setting (Terjesen et al., 2015). A brief history of such initiatives in European countries is provided in appendix 2. Over the years, the slow progress of females to the top board positions has gained considerable attention. Despite the equality initiatives and being a large proportion of the workforce, females are not promoted to the top corporate board positions due to potential discrimination (Broome, 2008), stereotypes (Fitzsimmons, 2012), glass ceiling (Arfken et al., 2004) and vertical segregation (Poggio, 2010). Additionally, there is huge criticism of the idea that females are not appropriate for strategic board positions (Vinnicombe et al., 2010).

Farrell & Hersch (2005) identified that along with the dearth of female presence, the other issue for female and minority groups in corporate boards was ‘tokenism.’ Tokenism is defined by Kanter (1977) as restricting a marginal group from evolving and adding valuable input to a firm’s value through reproach. Such negative remarks discouraged minority groups, and they eventually stopped their participation. Tokenism can result in one of three conditions: visibility, polarization, and assimilation (Elstad & Ladegar, 2012). The condition of *visibility* is characterized by continuous monitoring of female employees by male bosses. In *Polarization*, the presence of female candidates is perceived suspicious by the male directors and thus prohibits socialization for the female and limits all the sharing of information (either secretly or openly) about the boardroom. *Assimilation* refers to the preconceived belief or cliché of



the male director about the opposite gender. Certain roles are attributed with the female directors, and—based on these preconceived ideas—the abilities of females are underestimated. Such behavior discourages female directors from giving productive input in board decision making. Diversity can also foster tokenism if female board members are not present in appropriate numbers (Torchia, Calabro, & Huse, 2011). For any minority group to be a productive part of an organization, a certain number of them—known as the critical mass—must be included. Konrad, Kramer, and Erkut (2008) described that issues like tokenism are less abundant when more than one female is appointed as a director. They defined critical mass as when the presence of two or more females creates an influence on male colleagues that keeps them from criticizing female participation and considering female-made arguments as trivial in the boardroom. The critical mass normalizes the existence of females (as opposed to just having females for diversity), and they perform much better (Erkut et al., 2009). The actual transformation happens when the number of females is three or more and they do not fear negative criticism and discouraging remarks by their male colleagues. Kristie (2011) states, “One female on the board is a token, two is a presence, and three is a voice.”

Torchia et al (2011) described that in Norwegian board gender diversity reforms, firms which had three or more females on boards exhibited higher performance. Joecks, Pull, and Vetter (2013) also document the positive impact of three females on ROE in German organizations. Further, Liu et al (2014) describe that the incorporation of a greater absolute number of females on board as directors provided a greater positive influence on ROA and productivity. During the last century, achievement of gender equality was the driving force behind designing strategies adopted by European countries and other countries around the globe (European

Commission, 2016). To ensure the critical mass of female directors, many countries consider if and how public policy should respond. To achieve gender equality, various initiatives have been taken by countries and institutions (Lépinard, 2018; Teigen, 2012; Terjesen et al., 2015). A brief description of some prominent global initiatives for board gender diversity is provided below.

*The Feminine Mystique*

The chronological record of gender diversity in the United States is reinforced by “*The Feminine Mystique*” movement created by Betty Friedan. In 1963 Friedan, vocalized the issue of inequality in the workplace with regard to female representation. Friedan highlighted the issue and characterized inequality as “the problem that has no name.” She described that woman who had graduated and were not able to work—instead taking on responsibility for and within the household—feel annoyance, suffering, and frustration. Such emotional states arise due to the thwarting of ambitions. Friedan argued that women struggle in multiple ways, and—while struggling in different roles—they undergo a never-ending internal battle which they are unable to express. She explained this notion as, “The chains that bind females [the suburban housewife] in her trap are chains in her own mind and spirit. They are chains made up of mistaken ideas and misinterpreted facts, of incomplete truths and unreal choices. They are not easily seen and shaken off.”

She ignited a hidden fire in these females and encouraged them to chase their dreams and demonstrate their abilities by moving beyond the sphere of house to the upper echelons of the corporate world. She initiated the drive to recruit females into the workplace. Her efforts paid off, and since then, many steps have been taken to enhance workplace diversity. The implementation of Title VII of the Civil Rights Act of 1964—that prohibits any kind of biased treatment on the basis of race, gender, ethnicity or

faith—is the consequence of her efforts. The adoption of this law significantly increased the proportion of working women from 32% in 1964 to 48% in 1992. At present, the proportion of females working as professionals is larger, but the ratio of females promoted to the top positions of the corporate world is still trivial.

### *Thirty Percent Coalition*

One of the efforts to promote female presence on US boards was the “Thirty Percent Coalition (TPC),” which was endorsed by prominent institutional investors including California’s Public Employees Retirement Plan (CalPERS) and State Teachers’ Pension Plan (CalSTRS). TPC is a US institution with the goal to increase the percentage of females on board to at least 30% with a deadline of 2015. The group started a campaign in 2012 called “Adopt a Company,” in which they targeted companies that have all male directors in Russell 1000 and S&P 500. The Coalition strategically joined with big private investors, great leaders from the business world, and governmental initiators for the implementation of its intended actions. They wrote letters to companies, and as a result of their efforts, they saw noticeable differences. For the first time, more than 150 firms had employed a female to their boards. In 2010, the similar initiative was taken in the UK with name of 30% Club aiming at enhancing the female representation in the FTSE-100 board of directors by 2015 on a volunteer basis.

### *2020 Women on Boards*

Another US campaign initiated in 2010 aimed at increasing the representation of females on top positions of corporate boards by 20% by the end of 2020. Following California, the state of Illinois passed a resolution in 2015 to have at least three females on a board with nine members and two female members on a board with less than nine members with a transition period of three years.

*Davies Report*

The famous “Davies Report” presented by Lord Mervyn Davies in 2011 is another milestone manuscript in terms of diversity efforts around the world. Lord Davies disseminated his discoveries in a review titled “Women on Boards,” which advocated for a voluntary increase in female participation on the corporate boards in order to benefit from the advantages of gender diverse boards. He initially set a target of 25% female representation by 2015. In a succeeding review, the goal was raised to 33% for FTSE boards by the end of 2020.

*Australian Council of Superannuation Investors (ACSI)*

ACSI (provide voice on financial, economic and governance issues in Australia) in 2015, revised directives for governance mechanisms in which they forbade the authorization of companies with boards that had little to no gender variation. In accordance with the ACSI policy revealed in 2014, that requires ASX 200 boards to have 30% female with a deadline of 2017.

**Board gender quota laws**

In an effort to break male monopolistic dominance and address the complicated issue of discrimination, countries around the world have introduced various reforms (Terjesen et al., 2015). These reforms initiated by governments and regulators took various forms around the world, and they widely fall into one of two categories: voluntary reforms through recommendations in codes of governance or legislated efforts in the form of quota laws (Labelle et al., 2015).

Australia, the UK, and the US worked to enhance diversity in boardrooms by introducing self-regulatory measures known as voluntary reforms. These countries revised corporate governance structure and incorporated directives regarding adding

heterogeneous groups in boards of directors. The voluntary style of reforms work on the philosophy of “comply or explain”; all of the registered organizations are required to update their codes of governance based on the new criteria, and those who do not comply have to give an explanation. However, this non-binding approach of diversity enhancement has exhibited slow responses (Terjesen et al., 2015).

Corporate board gender quotas are considered a legislated approach for diversity enhancement; they are introduced as a redress mechanism to equalize opportunity for females in the corporate world in the form of mandatory or voluntary regulation (Holzer & Neumark, 2000). Mandatory reforms are characterized as “hard quotas,” as they are a type of law backed with penalties in case of non-compliance (De Cabo et al., 2019; Terjesen et al., 2015). These penalties include actions like suspension of membership, delisting from stock exchange, and closure of organization. Norway and France are examples of countries that mandated hard quotas for female board representation. In contrast, the soft quota approach like that adopted in Spain and the Netherlands is not supported by any legal action. With soft quotas, non-compliant organizations are allowed to do business, but such rebellious companies are not likely to receive governmental grants. Companies are encouraged to enhance board gender diversity through counseling, and firms are asked to provide proper justifications in the event of non-compliance.

Norway took the initiative of passing its mandatory board gender quota law after the failure of voluntary efforts to increase gender diversity. In 2003, the Norwegian parliament passed a mandatory quota law to ensure at least 40% female directors on boards by 2008. The law stated that after the deadline, non-conforming companies will face sanctions. Norway’s hard quota law set an excellent example of success for other countries to follow (Dale-Olsen et al., 2013; Terjesen et al., 2015).

## *Chapter 2: Literature Review and Hypothesis Development*

Among European countries, Spain was the first country that introduced a quota based on gender for corporate boards. In 2007, Spain opted for a soft quota approach which emphasizes all the firms listed on stock exchange to ensure a 40% participation of either gender in boardrooms. Following Norway and Spain, many other countries have made similar changes to equalize female representation in the top positions of the corporate world. In 2010, Iceland passed a quota law requiring boardrooms to have 40% female for firms with 50 or more employees working in either the private or public sector with a deadline of September 2013. Like Spain, Iceland also opted for a soft quota law without sanction (Arnardóttir & Sigurjónsson, 2017). In 2011, the Belgian parliament passed a hard quota law requiring 33% of board members to be female to guarantee the presence of both gender groups in decision making positions (Levrau, 2017; Terjesen et al., 2015). Italy also introduced the hard quota and obligated all the listed companies to ensure 33% female board of directors by August 2011. In case of non-compliance, the designated positions will be considered insignificant (Ferrari et al., 2018). The Netherlands' law for gender diversity on corporate boards demanded 30% female directors by listed and limited liability firms. They initiated soft quota law with a three year transition phase, during which there were no repercussions; after the transition period ended in 2016, the quota law became enforceable. Unfortunately, in the Netherlands the implementation of the quota law did not show any remarkable achievement in gender balancing among corporate boards as the average percentage of female directors only rose from 9.4% to 10.2% (less than 1%), as observed at the end of 2016 (Kruisinga & Senden, 2017). Germany was also characterized by a male dominated workforce; in 2015, females constituted only 6% of management and 20% of supervisory boards of dominant German companies (Holst & Kirsch, 2016). To enhance female participation on corporate boards, the German

parliament passed legislation in 2014. This law required all publicly listed firms to ensure that their corporate boards have 30% female by 2016 and 50% female by 2018 (Piscopo & Clark Muntean, 2018). In the similar vein, Portugal made it compulsory for registered firms to have 33.3% female directors via a hard quota law backed with sanctions in 2018. The Austrian government initiated gender quota reform in 2017 that made it compulsory for organizations with more than 1000 employees to have a minimum of 30% female among board of directors; the firms who failed to comply with the law were declared as illegal (De Cabo et al., 2019). Additionally, some states required listed firms to have at least one female director on their boards; Israel initiated such a reform in 1991, Finland in 2010, the United Arab Emirates in 2012, and India in 2013. Recently, Pakistan also adopted this reform and mandated that public firms should have at least one female director.

Voluntary reforms for enhancing gender diversity display different patterns. Australia was the first country to adopt such a voluntary reform, having done so in 2010. They incorporated diversity recommendations in their policy to guide corporations regarding the code of conduct. All of the listed firms have to abide by the structure and codes of governance. One prominent aspect of their governance code is that it demanded the dissemination of a diversity agenda as well as the action plan taken by the organization to achieve the set objectives for increasing diversity. It also demanded that the organization display its recruitment procedure and hierarchical chart clearly stating the number and positions of female executives. This approach has shown tremendous success in Australia, increasing the female participation in corporate boards from 8% in 2010 to 31.5% in 2018. The volunteer approach to enhance board gender diversity has increased female participation in the upper position of the corporate world without binding or imposing fines or implementing quotas. Australian reforms relied on

the “comply or explain” doctrine, in which firms that did not follow the policy had to explain their reasoning. Sweden and Luxembourg in 2009, Malawi and Poland in 2010, Nigeria in 2011, and Ireland in 2012 also introduced voluntary female participation by incorporating intended targets in their governance codes; the UK’s diversity enhancement campaign was also designed as a non-mandatory sanction similar to Australian reforms. In the UK, statistics show that the female proportion in FTSE 100 firms was 9.4% in 2004, and that it slightly rose to 12.5% in 2010. Among FTSE 100 corporations, 21% had male-only boardrooms; a mere 2% of corporations had hired a female board member, and only 13% of females were recently recruited as board directors. Lord Davies (2011) perceptively analyzed the issue and suggested a voluntary and non-mandatory gender reform in the aforementioned Davies Review. The Cranfield School of Management examined the outcome of Davies Review after two years and concluded that after two years of the implementation of voluntary reforms, the intended goals had not been achieved and firms were exhibiting even less of a tendency to incorporate female directors on boards. Specifically, the percentage of females as board members had increased to 17%, and 6% among the board of companies on FTSE 100. The voluntary efforts of gender diversity progressed slowly in the UK compared to Australia, and only 38 firms incorporated strategic goals regarding gender diversity in their objectives. Among the rest, 40 declined to set goals, and the remaining refused to reveal the number of females working in their firms (Choudhury, 2014). To this end, quotas bring an instant relief to the issue of gender disparity in corporate boards that may be lacking from voluntary reforms (Smith, 2018).

There are proponents of both voluntary and mandatory approaches who can justify their perspective for board gender diversity. Regarding mandatory reforms, the existing evidence suggests that a legislated approach was more successful in achieving



the intended female representation in the desired period (e.g., hard gender quota law in Norway and France) in comparison to the soft or voluntary reforms (as implemented in Australia and in the UK). It is argued that based on existing empirical evidence, mandatory board gender quotas are inevitable to achieve gender diversity on corporate boards (Choudhury, 2015; Nekhili et al., 2020). Furthermore, the enhanced proportion of female directors imposed by mandatory quotas improved the intellectual ability of the board by providing heterogeneous resources that facilitated decision making. At the same time, there were some negative repercussions associated with mandatory board reforms aimed at enhancing gender diversity in corporate boards. The most feared issue related to mandatory reforms is the token presence of female directors and the appointment of unqualified candidates just for the purpose of representation (Choudhury, 2015; Smith, 2018). Additionally, Norway experienced the phenomenon of “Golden Skirts,” in which a few female directors held multiple board positions without performing any significant role, thus undermining the significance of female directors (Seierstad & Opsahl, 2011). With all of this in mind, our study aims to contribute to the literature on the debate on the effectiveness of mandatory board gender quotas by exploring French setting in detail. Further, our study aims to add the evidence regarding the breaking of the double glass ceiling by exploring the position assigned to female directors as inside directors (working on the board only), independent directors and audit committee members (working on the most important board committee) and their impact on firm performance.

### *French mandatory board gender quota law*

In France, the historical development of gender quota law is linked to parity campaign introduced by feminist reformers to equalize male and female share in decision making bodies. This campaign also worked to inspire females to fight for their

rights of equal participation at the workplace. Although the traditional boomerang effect of parity movement thrived in the early 1990s, they did not last long (Keck & Sikkink, 1998). However, they gave rise to the importance of incorporating women in decision making. The growing European sensitivity to anti-discrimination procedures in the 2000s also put pressure on adopting equality measures. Unlike the US and UK, the French corporate sector is lacking in tracing female advancement on boards through any regular reviews, although the European Professional Women's network in Paris observes the data maintained by consultancies (Heidrick & Struggles, 2009). Between 1998-2003, the attendance of female directors was numerically enhanced by appointing female directors as union representatives; these silent observers on the board accounted for 41% of the total population of female directors on board in 2004 (Singh et al., 2015). The statistics presented in the European Commission reports revealed that from 2005 to 2007, the proportion of female as directors in the top 40 French firms rose only two points—from 7% to 9%. Given the slow progress of females to corporate boards and growing sensitivity towards this issue at state and international level, the French quota law was introduced as a tool to redress prejudice against females and to achieve functional equality (Lépinard, 2018).

The *General Rapporteure* of the Parity campaign and head of the delegation for female rights at the National Assembly, Marie-Jo Zimmermann endured a long struggle for the approval of gender quota legislation for corporate boards. She personally visited Norway and reviewed Norwegian reforms presented in the Gresy Report before presenting French gender quota legislation for corporate boards. She proposed an amendment<sup>5</sup> to article 3<sup>6</sup> on the basis of approval of political quotas to encourage

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<sup>5</sup> Marie-Jo Zimmermann proposed to add 'professional functions' along with elective offices.

women's equal access to top position of corporate board. After long debates and disagreements, the adoption of gender quotas for corporate boards was legalized in 2011 (Lépinard, 2018). The amendment presented by Marie-Jo Zimmermann in the French constitution regarding board gender quotas in January 2011 (n° 2011-103 of January 27th) was accepted by the parliament (Masselot & Maymont, 2014). This successful change was directed toward the 2011 law "*Copé-Zimmermann*," a two-step law requiring 20% female representation on boards by 2014 and 40% by 2017. This law was applicable to all publicly listed firms, to firms with a workforce of 500 employees or more (listed or non-listed), and to firms with a value of 50 million euros. The effectiveness of mandatory quota law was increased by introducing sanctions in case of disobedience. The severity of these sanctions ranges from a temporary deferral in payment of the director's fee to the termination of recruitment of male employees and the annulment of the firm's registration. For smaller boards (fewer than eight), explicit dispositions were allowed. Further, all permanent members were to be considered as board members with the exception of employee agents, a group that had previously consisted of female directors (Maclean & Harvey, 2008).

### *Corporate boards in France*

In France, there are two types of board: single, unitary or dual board. Firms can opt for each option according to their choice. Within a dual board, there is a supervisory board as well as a management board, though the applicability of quota law

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<sup>6</sup> Article 3 states that "National sovereignty shall belong to the people, who shall exercise it through their representatives and by means of referendum. No section of the people or any individual may arrogate to itself, or to himself, the exercise thereof. Suffrage may be direct or indirect as provided by the Constitution. It shall always be universal, equal and secret. All French citizens of either sex who have reached their majority and are in possession of their civil and political rights may vote as provided by statute. Statutes shall promote equal access by women and men to elective offices."

is restricted to the supervisory board only. As far as the size of the board is concerned, it can vary from 3 to 18 members, according to French law. The law is applicable to both insider and outsider directors (with exception of directors representing unions), and directors are appointed with a maximum tenure of 6 years (Ferreira et al., 2017). One unique aspect of French supervisory boards is the presence of family owners as “non-independent” directors (Faccio & Lang, 2002). Nekhili and Gatfaoui (2013) also reported that in France, the nomination of female directors is significantly linked to family ownership. In fact, Maclean and Harvey (2008) found that in the top 100 French firms, 37% of female directors were of family in France, while no female directors were found to be family members in the UK.

Most organizations are registered with the Association of French Companies (AFEP-MEDEF), which provides the regulatory guidelines for French firms. According to the instructions given by the AFEP-MEDEF, boards for publicly listed companies should be at least half composed of independent directors and one third composed of independent (outside) directors for closely-held companies. The governance code instructions require the outside (independent) directors to conduct frequent meetings without inside directors. At maximum an independent director can acquire five directorships in listed companies, including in overseas firms, while an executive director can hold a maximum of three directorships in both domestic and foreign-listed firms. In France, the law gives individual firms freedom regarding the number and structure of firm governance. In general, French organizations choose to have three committees: an audit committee (for monitoring the audit function), a nomination committee, and a committee for compensation.

The law is applicable to limited liability corporations, limited partnerships, and the European company statutes—the three legal choices available for listed companies

to adopt. Non-listed companies can adopt other legal arrangements such as SARL, in this structure firms don't have boards, or SAS, in which firms have choice to have aboard or not. That said, non-listed firms are not obligated to comply with the board gender quota law.

## **Theoretical background**

Theoretical rationalization of the construct of association between gender diversity on corporate boards and performance of the firms is provided in the light of agency theory (Jensen & Meckling, 1976), resource dependence theory (Pfeffer & Salancik, 1978), human capital theory (Becker, 1964) and institutional theory (DiMaggio & Powell, 1983)

The idea that increased diversity on corporate boards can increase performance is borrowed from agency theory (Bennouri et al., 2018; Reguera-Alvarado et al., 2017). This theory revolves around the principal-agent association, or the idea that the principal (owner) hires agents (managers) to perform various duties and create a competitive edge. Under this theory, it is likely for the agent to act opportunistically on the principal's behalf and conceal important information while making decisions (Jensen & Meckling, 1976). However, any intervention by shareholders to mitigate issues leads to increased agency costs (Jurkus et al., 2011); the higher the agency cost, the more negatively it is associated with the financial performance of the firm. Fama and Jensen (1983) proposed a separation of ownership and control in which those involved in decision making should have stable opinions, compulsory knowledge, and different viewpoints to avoid the potential risk of agency problems. To this end, the presence of heterogeneous boards provides varying viewpoints and independent monitoring that act as a control mechanism (Reguera-Alvarado et al., 2017). Prior

studies have also determined that female directors are better monitors and tend to be more independent than male directors (Adams & Ferreira, 2009; Bianco, Ciavarella, & Signoretti, 2015). Thus, in the presence of female directors on boards the monitoring efficiency of the board is increased, which add to the organization's value by mitigating the costs associated with agency problems.

The theory of resource dependency and human capital suggest that incorporation of female directors enriches corporate boards with social and intellectual resources different from male directors, therefore diversifying the pool of available resources for boards (Lückerath-Rovers, 2013). According to resource dependency theory, firms appoint directors on the basis of their unique skills and competencies consequently, these directors enrich the firm with social and human assets and help the firm to gain maximum resources from the environment (Pfeffer & Salancik, 1978). Additionally, this theory proposes that increase in board size by incorporating varying gender mix provide firms additional resources that facilitate their ability to create links with the external environment (Pfeffer, 1973). However, women have been discriminated against regarding the appointment of board directors by managers and stakeholders on the basis of being less competent despite holding equal educational qualifications; this prevailing prejudice restricts females from top positions regardless of their qualification, ability, and experience. In the face of statistically proven gender discrimination, quotas can be a source of diversity in firms, as they have been proven to bring productive resources into an organization by forcefully increasing the number of females on boards. Gender diversity on boards provides firms with important human resources and distinct skills that help firms to gain a competitive advantage (Hillman & Dalziel, 2003). Furthermore, legislators believe that quotas can be a cure to the glass

ceiling that prohibits highly talented females from promoting to leadership ranks, consequently adding valuable worth to firms (European Commission, 2012).

The theory of human capital proposes that formal education and learning of individuals, their experiences and skills play an important role in firm productivity (Becker, 1964). Kesner (1988) suggested that every director brings their exclusive human skills both soft and hard to the board. Despite this, Oakley (2000) reports that male members discriminate against females and discourage them from administrative rewards like training and development or promotion. In the similar sequence of ideas, there was a common partiality that females lack adequate competencies for board level positions. Recent research, however, has proven that females have different aptitudes than males and opt for inimitable results, hence bringing a level of diversity into the organization is linked to increased firm performance (Huang & Kisgen, 2013). Similarly, Davies (2011) reports that 60% of university graduates are females both in Europe and in the USA, and Smith, Smith, and Verner (2006) demonstrated that female managers with university degrees affect firm performance positively.

Institutional theory describes that organizations conform to institutional pressures by reproduction or imitation of structures and cultures in order to gain legitimacy. This legitimacy desire consequently creates similarity and isomorphism among organizations. According to DiMaggio and Powell (1983) there are three types of institutional pressures. *Coercive* pressures are exerted by the society, other institutions, and regulators. Society exerts coercive pressure in the form of societal norms regarding desired actions by the organizations. Other institutions guide organizations to behave in certain ways in order to get resources and regulatory institutions give directions of acceptable behaviors in order to get legitimacy. *Mimetic* pressures give standard to other organizations to be copied from successful

organizations in order to avoid environmental uncertainty. Normative pressures are guided by the professional values and are communicated through shared visions and professional training in the organization. These institutional directions provide homogenous rules that lead towards a uniform organizational structure in a particular field (e.g., commerce, financial institutions and non-financial institutions).

Rigolini and Huse (2021) examined the mandatory board gender diversity legislation introduced by the Italian government through the lens of institutional theory and differentiated between mimetic, normative, and coercive pressures. In terms of legislative efforts to diversify boards, mimetic pressure is classified as a voluntary or laissez-faire approach, while normative pressure is classified as a societal pressure to increase board gender diversity. Labelle et al. (2015) claimed that the key difference among board gender diversity policies is the application of sanctions in cases of disobedience with the identified targets. Under normative pressure, the sanctions are either weak or non-existent, whereas coercive pressure is characterized by instant and severe sanctioning.

In the French context, coercive pressures for board gender diversity appeared weak. Maclan and Harvey (2008) claimed that the French Government denied the issue of corporate board gender diversity for a long time, as French governance codes (e.g., the Bouton Report in 2002 or the Vienot Report in 1995/1999) lacked an emphasis on gender diversity on corporate boards. French board rooms were also occupied by “old boy’s network” selecting male managers (Adams & Ferreira, 2009). However, since 2008, the issue of board gender diversity—particularly with regard to female participation in corporate boards—has gain serious attention. The mandatory board gender quota put coercive pressure on the firms to hire female directors (Singh et al., 2015). It was further reported that in response to mandatory board gender quota



legislation, French firms responded optimistically by recruiting female directors on board. This positive response from big firms (SBF120) to the quota law created a mimetic pressure on the other firms to follow suit.

Largely, the rationale of gender quotas is also justified by economic theories, as they predict a positive association between gender quotas for corporate boards and economic outcomes of the firms. That said, there is no explicit evidence of such a relationship, and even so it would be contingent upon an organization's aims and objectives.

## **Hypothesis development**

### *Female directors and firm performance*

Gender diversity studies have been a prominent issue in academia over the last two decades (Kirsch, 2018). The motivation for these studies stems from the fact that the number of females in upper management positions has not substantially increased. There is substantial research to explore the nature of association between female members as director and the performance of organizations, but is still debatable due to ambiguous results. One stream of literature advocates that these two constructs are positively associated with each other. Such studies report that the presence of gender-diverse board of directors enhances the market value and profitability of firms by introducing diverse intellectual resources to the boardroom that provide a broader perspective on various aspects under consideration (Burke, 1994; Campbell & Mínguez-Vera, 2008; Daily & Dalton, 2003). These diverse intellectual resources provide a wider range of alternatives for decision makers and thus facilitate choosing the most effective course of action (Carter, D'Souza, Simkins, & Simpson, 2008). According to Carpenter (2002), there are differences in the logical reasoning of male

versus female directors. Female directors give additional insights and alternative views due to their distinctive experiences and reasoning processes, hence expanding the perspective regarding issues under consideration. For example, Nielsen and Huse (2010) found that females are more ethical and conscious of social values. Consequently, female directors help in generating multiple viewpoints and considering ethical dimensions in decision-making that enhances corporate performance (Van Ginkel & Van Knippenberg, 2008). Isidro and Sobral (2015) also argued that females being more ethical help firms fulfill social and ethical compliance that adds to the value of the firm. Jianakoplos and Bernasek (1998) argued that females exhibit higher degree of risk aversion while dealing with financial matters and try to avoid all possible overt losses. Post & Byron (2015) report that those firms with higher percentage of female directors exhibit positive changes in accounting performance and no effect on market performance, for a sample of 144 firms. In this analysis, it was suggested that the differences in the values and intellectual abilities of female directors also affect the problem solving method of the board. This suggests that an enhanced proportion of female directors in the boardroom may influence not only the decision making process, but also improve the quality of decisions. This may be due, at least in part, to the fact that female directors have a greater tendency to obtain university and/or higher education degrees compared to male directors (Carter et al., 2010; Hillman et al., 2000).

Further, Farrell & Hersch (2005) suggested that the incorporation of females in the advice-giving mechanism of an organization is helpful in building a positive image that attracts new investors. Jurkus, Park, and Woodard (2009) stated that opposite genders on a board are negatively correlated with the agency cost and restrain the agency problems. Agency cost is described as the cost of monitoring, organizing, and solving conflicts among groups of people with varying interests (Fama & Jensen,

1983). The higher the agency cost, the more negatively it is associated with financial performance of the firm (Core et al., 2006). Heterogeneous boards provide varying viewpoints and independent monitoring, which act as a control mechanism for agency problems (Reguera-Alvarado et al., 2017). Specifically, female directors act more independently, pay keener attention to all details, and act more cautiously while making decisions since they are not part of an “old boys club” (Adams & Ferreira, 2009). In light of these arguments, it is suggested that gender diversity on the corporate boards act as a restricting force that reduces the agency cost and thus adds to the firm financial value (Hillman & Dalziel, 2003).

Adams & Ferreira (2009) also argued that governance structure is important when examining the diversity-performance link. In the presence of a strong governance structure, an inverse relationship is found between gender diversity on corporate boards and performance. Because board gender diversity enhances the effectiveness of monitoring mechanisms, firms that already have a vigilant structure consider this extra check to be over-supervision. On the other hand, gender-diverse boards are more crucial for firm performance when there is no strong governance structure. That said, Gregory-Smith et al. (2014) found that the gender arrangement of a board had no effect on firm performance on a sample of firms listed in the UK. Wang and Clift (2009) also reported no significant effect of board gender diversity on accounting measures of firm performance (ROA and ROE), and Rose (2007) found no significant link between women on board and firm market performance among Danish firms. Similarly, Carter et al. (2010) found no link between gender diversity on board and market performance in the US. They argued, though, that the possible correlation between boardroom gender diversity and performance of the firms is contingent upon the unique circumstances of the individual cases under consideration. Haslam, Ryan, Kulich,

Trojanowski, & Atkins (2010) studied the association between boardroom gender diversity and firm market and accounting performance in the UK. No effect was found for accounting performance, however market performance was reduced on a gender diverse board. Similarly, Mínguez-Vera and Martin (2011) found an inverse relationship between board gender diversity and the value of a firm. They postulated that the results may be due to females taking less risky decisions, thus decreasing the performance of the firms. Females who act as silent learners—a phenomenon marked by just presence of members without adding any value to decision making—and who do not belong to traditional backgrounds imitate other members, and as such effectively do not participate in decision making (Gordini & Rancati, 2017). This ultimately works against the possibility of benefitting from diverse gender opinions.

That said, a direct relationship between increasing female board presence and firm performance has been reported in the French context. Sabatier (2015) found that gender diversity has a strong positive effect on the performance of the firm, as firms with gender-diverse boards exhibit high performances compared to firms without. These results indicate that incorporation of female directors in the boardroom helps firms achieve higher performance. In addition, the author also reported that an organization's overall strategy performs a significant role in promoting gender diversity when the recruitment of female directors is linked to long-term organizational strategies rather than short term initiatives. In the same respect, Bennouri et al. (2018) found female presence in boardrooms is related to a positive ROA but negative Tobin's Q. As accounting-based measures of performance are associated with the advice-giving function of board and female input in decision-making help firms in improving the effectiveness of decisions, the presence of females as directors on the corporate boards serves to improve the firm's accounting performance. However, the market-based

measure of performance depicts the market perception of the vigilance and monitoring ability of firms. In the French context, the market does not respond positively to gender diversity on a board (Bennouri et al., 2018). Even so, Ahmadi, Nakaa, and Bouri (2018) found a positive correlation between board gender diversity and firm performance (measured by ROA and ROE) while studying the diversity-performance link in the French context. According to the authors, females being different from their male colleagues improve the financial performance of firms.

From the archival research, it appears that board gender diversity has a significant effect on firm financial performance. However, the potential relationship has vague and inconsistent results (Bennouri et al., 2018). The correlation between female board membership and firm performance is also affected by the legal system and the extent of investors' protection (Post & Byron, 2015). The French legal system is characterized as frail for investor protection, and the ownership structure is also concentrated (La Porta et al., 2008). Considering that gender diversity adds positively to firm's value in weak governance structure (Adams & Ferreira, 2009), the legal system of France, and the previous studies conducted in the French context, we anticipate a positive relationship between female directorship and firm performance in France and therefore proposes the following hypothesis:

**H1:** *There is a positive relationship between female directorship and firm performance.*

### *Female directorship, quota law and firm performance*

Recently, the introduction of board gender quotas in several countries has generated a new branch of literature. Researchers have conducted analyses to study the effects of these reforms on various organizational aspects (Reddy & Jadhav, 2019). However, there are very limited studies on the connection between gender diversity and

performance, particularly after the enactment of a gender quota law, and the results that are available are mixed. Nygaard (2011) examined Norwegian reforms and reported a positive effect of board gender diversity reforms on firm returns. The author argued that the impact of reforms depends upon information asymmetry between firms and outsiders; these gender diversity reforms effect directly on the firms with low asymmetry, but inversely on firms with high asymmetry. Conversely, Ahern and Dittmar (2012) found that after implementing a gender quota law in Norway, a large negative effect on firm market based performance was measured; the announcement of mandatory legislation for board gender diversity applied an exogenous pressure that was perceived negatively by the market. Moreover, the appointment of younger, less experienced female directors for sake of compliance with the compulsory regulations for board gender diversity reduced the accounting returns. Matsa and Miller (2013) used a difference-in-difference design and found a negative effect of gender quota on ROA. The authors reported that firms that appointed new female directors and increased labor costs associated with the new appointments decreased their profits. Different still, Eckbo et al. (2016) found no effect of quota reform on firm performance measures. They argued that by using a robust analysis, the negative results reported by Ahern and Dittmar (2012) disappeared. The authors also reported that variations in sample size and methodological techniques lead to different results.

In further efforts to identify the effectiveness of legislated gender diversity reforms on firm performance, Labelle, Francoeur, and Lakhali (2015) conducted a cross-country study to evaluate the effectiveness of voluntary versus mandatory approaches towards board gender diversity from 2009 to 2011. The authors reported an inverse relationship between board gender diversity and firm performance when brought about through a legislative approach. From a supply-side perspective, the

## *Chapter 2: Literature Review and Hypothesis Development*

authors argued that an accelerated surge in the demand for qualified and suitable females for the position of directors can create a scarcity of females with appropriate business knowledge, compelling firms to hire less qualified females. This was corroborated by Smith (2014), who found that there was a supply and demand imbalance in which the supply of existing, qualified women was less than their demand. Ferrari et al. (2016) found that mandatory board gender quota legislation affected stock market return in Italy positively. The author reported that mandatory board gender quotas induce a restructuring of the board that is perceived well by the market. Lucas-Pérez et al. (2015) also identified a positive relationship between gender diversity, board effectiveness, and firm financial performance. The authors concluded that in the Spanish context, legislative action had a positive effect on economic activity and gender quotas have made way for the diverse intellectual resources and expertise of female directors. Reguera-Alvarado et al. (2017) substantiated this when they found a positive effect on board gender diversity and economic performance as the result of Spain's gender quota law, claiming that females bring new knowledge and skills to the board that helps firms in achieving economic efficiency.

Comi et al. (2016), however, revealed mixed results on a sample of Spain, France, and Italy. According to their findings, the quota law in Spain had no effect on performance, while the mandatory quota in France resulted in a negative effect on accounting-based performance measures. The authors also conducted an in-depth investigation of the Italian quota law and found it to have a significant positive effect on productivity, as the introduction of mandatory board gender quota legislation extended an opportunity to qualified female directors to enter the upper echelons of corporate boards that had previously been unreachable for female directors. Compared to France and Spain, female economic participation in top corporate positions was very

low in Italy; the board gender quota legislation allowed qualified females to access the top corporate positions and bridged the large gap of poor economic participation of female directors, ultimately enhancing the productivity and quality of board members in terms of education and experience. Comi et al. (2016) established that the heterogeneous effects of gender quota legislation for corporate boards depend upon the contexts of the country in which the law is being applied, as well as the design of the law itself. To this end, Verloo and Lombardo (2007) proposed that the historical background, political perspectives, and cultural ideologies of each country play an important role in the adoption of gender equality policies. Further, institutional settings are also a pertinent feature that performs an important role in the success or failure of corporate board gender quotas (Hughes et al., 2017; Terjesen et al., 2015). As the transformative potential of a corporate board gender quota is highly contingent upon the context in which it is embedded, it is pertinent to evaluate individual country cases with respect to the factors that favor or hinder gender equality (Hughes et al., 2017).

It is notable, though, that Brahma, Nwafor, and Boateng (2020) reported female representation through recommendation in governance codes as positively related to the performance of UK firms. They found that the positive effect on financial performance is more pronounced when three or more females are appointed to the board. Such enhanced gender diversity in the boardroom is associated with a dynamic workplace and improved governance system. Moreover, the appointment of qualified female directors on the board provides the firms with a competitive advantage in the global markets due to the increased attention on low female representation in top corporate positions. Given the previous studies, we propose following hypothesis:

**H2:** *The positive relationship between female directorship and firm performance is enhanced after the enactment of gender quota legislation.*



*Position of female directors on board, quota law and firm performance*

Since the relationship between board gender diversity and firm performance has been investigated extensively, the focus has been diverted to the importance of board committees and their composition (Adams, 2003; Adams et al., 2010; Guo & Masulis, 2015). Recent research works to identify the vital role of board committees in board functioning (Adams et al., 2010; Guo & Masulis, 2015). According to Campbell and Mínguez-Vera (2008), directors on boards execute their authority through the positions assigned to them within the board. To this end, Rebérioux and Roudaut (2016) argued that not all directors are equal—there are some important positions within corporate boards (e.g., committee memberships, independent directors, and committee chairs), and directors holding these positions have a greater ability to influence the decisions of corporate boards. Green and Homroy (2018) added that despite the important role board committees play, the mechanism of member appointment is still not well understood. Although there is evidence related to required capability, regulatory requirements remain unclear (Dass, Kini, Nanda, Onal, & Wang 2014; Guner et al., 2008).

In terms of legislation, both obligatory and voluntary regulations have increased the appointment of female directors on the corporate boards, but neither of these regulatory efforts ensure the incorporation of appointed female directors within important governance structures. As argued by Rebérioux & Roudaut (2016), participation of female directors in important board committees is a more effective criteria to ascribe to board gender diversity, and it is more likely to be associated directly with firm performance. In the wake of board gender diversity reforms, the link between board and board committees is important to explore because the assignment of female directors to board positions and their involvement in decision making is likely

to shape the impact of reforms focusing on gender diversity on corporate boards. Following the same sequence, Huse (2016) argued that succeeding the enactment of gender quota legislation for corporate boards, the most promising theme to investigate is the composition of corporate boards with respect to the positions assigned to female directors on board.

In the French context, initial investigation of positions assigned to female directors in response to the Cope-Zimmerman law after the first compliance period (i.e., 2014) provided evidence of a double glass ceiling and positional gender segregation (Rebérioux & Roudaut, 2016). However, following the maturation of the Cope-Zimmerman law in 2017, no study has examined the effect of board gender quota legislation on firm performance with respect to the positions assigned to female directors on boards. So far, only two studies have examined the positions of female directors on board and their impact of board gender quota legislation. Nekhili et al. (2020) studied the impact of gender quota legislation on audit fees and emphasized the importance of the position of female director on the board. Another study conducted by Nekhili et al. (2021) examined the effect of board gender diversity increased by gender quota legislation on related party transactions (RPT) and reported that the presence of female directors had a negative effect on RPTs. Keeping in mind this existing literature, our study investigates the positions assigned to female directors on corporate boards—such as inside directors (working on board only), independent directorship and audit committee membership—in compliance with the Cope-Zimmerman law and their impact on firm performance.

*Female inside directors, quota law and firm performance:*

Boards are responsible for accomplishing particular tasks (Post & Byron, 2015; Zona & Zattoni, 2007). Boards perform their duties with the help of dedicated

personnel called directors. There are two types of directors: dependent (also known as executive or inside) directors, who have a professional or personal association with the firm, and independent (or outside) directors, who do not have any such association (Adams et al., 2010; Hermalin & Weisbach, 1998). Two important functions of boards—advising and monitoring—are each associated with different types of directors (Bennouri et al., 2018); inside or executive directors take on advising roles, while independent or outside directors are responsible for monitoring concerns (Adams et al., 2010; Hermalin & Weisbach, 1998). Corporate boards rely on committees for proper functioning (Green & Homroy, 2018). Although there are differences in the number and duties of committees across firms, the audit committee, the nomination committee, and the compensation committee are the most common. It is argued that directors who hold important committee positions have greater influence on corporate decisions (Reeb & Upadhyay, 2010). With respect to the board gender quota legislation, the assignment of board members to board positions is thought to shape the impact of board gender quotas not only on corporate governance, but also on firm performance. If female directors are not appointed to important board positions or participate in committees that allow them to be involved in strategic decision making, there is a high probability that the significance of female directors for firms may be decreased and thus jeopardize the effectiveness of gender quotas legislation for corporate boards (Reberioux & Roudaut, 2016).

Labelle et al. (2015) reported that compulsory regulations imply urgency and generate such an upsurge in the demand for more female directors that it leads to a supply shortage of females with adequate corporate knowledge, therefore obligating firms to hire less qualified females. As such, obligatory quotas may foster tokenism through the appointment of unqualified candidates to board of directors only on the

basis of their gender (Choudhury, 2015; Smith, 2018). Indeed, before the enactment of the Cope-Zimmerman law, French firms appointed female directors who were associated with leading politicians or controlling shareholders (Bolshaw, 2011; Fitzsimmons, 2012). These appointments are typical examples of token female directors, and they are expected to inversely impact the monitoring of the board and consequently firm performance. Token female directors are probable to impact firm performance negatively due to the fact that they are not involved in policy making and may be regarded only as burden for their firms. Further, recent research shows there is a tendency to appoint females directors, particularly in response to mandatory board gender quota legislation (Ahern & Dittmar, 2012; Bohren & Staubo, 2015; Reddy & Jadhav, 2019; Reguera-Alvarado et al., 2017;). However, these female directors are less likely to be involved in policy making, and consequently, these directors may make insignificant contributions that are unlikely to improve performance of their firms (Ahern & Dittmar, 2012; Green & Homroy, 2018; Gregory-Smith, 2013; Liu et al., 2014). Additionally, quota regulation also risks fostering the “Golden Skirts” phenomenon (e.g., a sole female director sitting on various boards) seen in Norway following the enactment of its quota law (Huse, 2012). Keeping this in mind, it is important to examine link between inside/executive female directors—who are appointed on such board positions where they are unable to make significant contributions in the policy making of their firms—and firm performance. In this regard, we propose the following hypothesis:

**H3a:** *The appointment of female inside directors (on board only) has a negative relationship with firm performance, and this relationship is more pronounced in the post-quota period.*

*Female independent directors, quota law and firm performance:*

Board independence is considered crucial for evaluating board composition. Both regulators and minority shareholders perceive independence as a direct mechanism of ensuring managerial accountability. The ultimate tactic to enhance board independence is to recruit independent directors—i.e., directors who are not affiliated with the firm. The recruitment of more independent directors will add differing views and unique intellect, therefore increasing the efficiency of board. Fama and Jensen (1983) determined that independent board members are vital and play an important role in monitoring by reducing agency cost. Additionally, independent directors add more value to organization due to lack of opportunity for a person to derive any personal gain from his official position (Jensen & Meckling, 1976). As such, independent boards more vigilantly monitor management teams and assure improvement in performance (Bennouri et al., 2018). The minimum proportion of independent directors on a board is decided by the regulatory guidelines of each country. In France, for example, the AFEP-MEDEF code requires public limited companies to appoint at least half of their directors be independent directors and private limited companies to have at least one third of their directors be independent.

Prior studies have proven that a board's engagement in strategy is contingent upon board independence (De Masi, Słomka-Gołębiowska, & Paci, 2018). Since the role of an independent director is to convey outsider viewpoints and defend shareholder interests, they work to enhance board commitment to formulate and achieving strategies aimed at maximizing the financial and social value of the firm. According to existing empirical literature, females are found to be more efficient in their roles as independent directors because they exert more independence compared to men (Adams & Ferreira, 2009; Bennouri et al., 2018; Gull et al., 2018). Adams & Ferreira (2009)

argued that female directors are outsiders to the “old boys club,” and as such they present contrasting views and different opinions that help boards accomplish better decision making. Moreover, the authors reported that presence of female directors on a board increases both the meeting frequency of the board and the attendance of board members, thus improving the monitoring efficiency of boards. Aside from their monitoring ability, female directors are more cautious in terms of risk and extremely sensitive regarding their esteem and their organization’s prestige, leading them to adopt a more independent style and frequently ask questions in board meetings (Krishnan & Parsons, 2008; Srinidhi et al., 2011). Support for this argument is provided by Abbott, Parker, & Presley (2012), who reported that female directors were found to be more independent than their male counterparts in a sample of US firms. Similarly, De Masi et al. (2018) reported that the independent status of boards was increased by the presence of a greater number of females on the board in Italian listed firms.

Existing empirical evidence regarding board independence and firm performance has mixed results. Epps and Ismail (2009) indicated that firms in the United States with more independent board members have better performance. Ameer, Ramli, and Zakaria (2009) also report a direct relationship between the presence of more independent directors and firm performance in Malaysia. Liu et al. (2015) further found that there is a positive relationship between board independence and firm operating performance in China. Similarly, Liu et al. (2014) determined that the representation of female independent directors is associated with an increase in the accounting performance of Chinese firms. That said, Cavaco et al. (2016) documented a significant negative relationship between firm accounting performance and board independence in the French context. According to them, independent directors suffer from informational breaches that negatively biased their decisions and outweighed the

possible benefits of independence into loss. Further, though Bennouri, et al. (2018) found female directors' independence to be positively associated with market-based measure of firm performance (Tobin's Q), it was negatively associated with accounting-based measure of performance (ROA) in the French context.

In response to board gender diversity reforms, female directors are significantly increasing in boardrooms and are being appointed as independent directors. Linciano, Ciavarella, and Signoretti (2015) reported that following the quota law, there has been an increasing trend in the appointment of female independent directors in Spain. However, the impact of increased proportions of female independent directors has not been uniform across countries. For example, Bohren and Staubo (2015) found that the appointment of female independent directors in compliance with the board gender quota law has increased board independence in Norway, but that this increased board independence has negatively affected firm ROA. These negative effects were more prominent in small and non-listed firms, and the authors explained that each firm's need for monitoring and advisory functions vary; small firms need advisory functions more than monitoring, which is why female independent directors negatively affect the value of small firms. In contrast, De Masi et al. (2018) found that the increase in female independent directors in response to the gender quota law was positively associated with board activities in Italy. The authors demonstrated that the representation of female independent directors has increased the attendance of board members and the number of board meetings, resulting in better board monitoring. Similarly, while investigating the impact of board gender quotas on the director labor market in France, Ferreira et al. (2017) documented that post-quota female directors have less family association than female directors in pre-quota period and are more independent in executing their monitoring duties. Nekhili et al. (2020) also found an increasing trend

in the appointment of female independent directors in France following the mandatory board gender quota reform and reported that the appointment of these female independent directors helped in reducing audit fees by increasing monitoring efficiency. Even so, board gender diversity is found to be negatively associated with related-party transactions in the French context (Nekhili et al., 2021). The authors argue that the presence of female independent directors has enhanced the monitoring ability of boards such that the number of RPTs was ultimately decreased. Considering the effectiveness of monitoring function and the effect female independent directors have on board activities, audit fees, and RPTs we propose the following hypothesis:

**H3b:** *There is positive relationship between the appointment of female independent directors and firm performance, and this relationship is more pronounced in the post-quota period.*

*Female audit committee members, quota law and firm performance:*

The audit committee has a monitoring role within corporate boards and ensures the quality of financial information (Fama & Jensen, 1983; Klein, 2002; Nekhili et al., 2020). A review of literature on corporate governance also shows that the functioning of corporate boards and their committees is affected by the gender diversity of board members (Adams & Ferreira, 2009; Erhardt et al., 2003; Fondas & Salsalos, 2000; Huse & Solberg, 2006; Nielsen & Huse, 2010; Rose, 2007). Extant research shows that women are more vigilant in performing boards' monitoring functions. This is perhaps due to the fact that there are significant differences in logical reasoning patterns, communication skills, risk tolerance, and monitoring abilities between males and females (Adams & Ferreira, 2009; Adams, Gray, & Nowland, 2010; Gull et al., 2018). In general, females have been found to demonstrate less opportunistic behavior than men (Ambrose & Schminke, 1999; Bernardi & Arnold, 1997). What's



more, female directors better facilitate the exchange of information among internal management and auditors in cases of conflict due to their superior communication skills (Nekhili et al., 2020). Adams & Ferreira (2009) reported that when females are assigned monitoring duties, they have been found to be more strongly affiliated with their fiduciary responsibility and to perform exceptionally better than their male counterparts. Moreover, the ethical and moral values of female directors are higher and they are more concerned with their personal and organizational reputations. Therefore, they adhere to their monitoring duty more passionately to protect their reputation.

Archival research has shown that audit committee effectiveness is affected by gender diversity on the audit committee. Srinidhi et al. (2011) reported that firms with at least one female director on the audit committee demonstrated superior earning quality in the US context. Thiruvadi and Huang (2011) also found that female appointment to the audit committee decreased the practice of earning management in U.S firms. Pucheta-Martinez et al. (2016) provided evidence of improved financial information quality in the presence of female audit committee members in Spain. That said, Aldamen et al. (2018) discussed a positive link between female members on the audit committee and audit fees. In the French context, Gull et al. (2018) suggested that the involvement of female members in the audit committee deters managers from earning management. More specifically, the authors reported that the appointment of female directors on the top positions of the corporate boards (i.e., CEO and CFO) minimizes the practice of earning management. Nekhili et al. (2021) documented a negative relationship between diversity on boards and related-party transactions (RPTs). The authors further elaborated that this negative correlation is driven by the involvement of female directors in board monitoring responsibilities via the incorporation of female directors on most important committee of board (i.e., the audit

committee). Green and Homroy (2018) investigated the economic impact of gender diversity on corporate boards in the context of large European firms and found that the appointment of female directors on board committees (particularly the audit committee) is positively correlated with firm performance, as the appointment of female directors on board committees provides them the opportunity to be directly involved in the functions of corporate governance in such a way that they impact firm performance. Their findings provide an economic rationale for female representation on corporate board committees.

Existing empirical evidence on exploring the link between the implementation of board gender quota laws and female directors' positions on boards is scarce. Reberieux and Roudaut (2016) examined the initial impact of board gender quotas on board composition for a period of six years (2008-2014) and reported that female directors were less likely to be assigned to important monitoring committees compared to their male colleagues. Réberieux and Roudaut (2019) further investigated the positions and the compensation of newly-appointed female directors in response to the mandatory gender quota law in France during the first compliance period (i.e., 2014). The authors stated that the gender quota was successful in opening the doors of boardrooms to new generations of female directors without previous board experience due to a supply side shortage of experienced female directors. The author called these directors "rookie female directors" (defined as females with no previous board experience). However, these rookie female directors gained limited access to key positions within boards and received unequal compensation compared to rookie male directors. These findings, though, were not definitive. Nekhili et al. (2020) studied the moderating effects of gender quota law on the relationship between gender diversity on board and audit fees; their findings report the monitoring effectiveness of boards is

improved and demands less effort from auditors to assess audit risk, therefore lowering audit fees. They also documented that French firms assigned a more significant monitoring role to female directors in response to the mandatory law for board gender diversity. In the light of the findings of Nekhili et al. (2020), we postulate our hypothesis as:

**H3c:** *There is a positive relationship between the appointment of female audit committee members and firm performance, and this relationship is more pronounced in the post-quota period.*

## Chapter 3: Research methodology

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### Sample selection

Our sample consists of all the firms in the SBF120 index listed on Euronext Paris over the period 2001-2019. Financial, real estate, and foreign firms listed in France have distinct regulations and characteristics, and as such, we followed previous studies and eliminated these from our data set (Bennouri et al., 2018; Liu et al., 2015; Matsa & Miller, 2013; Sila et al., 2016). We also excluded firms that were not listed by December 1, 2019, and firms whose data was missing. After applying these constraints, a final sample of 1,610 firm-year observations was achieved.

We retrieved the financial and accounting information of our sample firms from Thomson DataStream. We manually retrieved all information regarding the board of directors (e.g., the number of board directors and their committee membership, independence, and frequency of meetings) and the attributes of female directors (e.g., experience, education, nationality, multi-directorship, and tenure) from the registration documents of the sample firms. We obtained these registration documents from the website of the French Financial Markets Authority (AMF) and from the website of each sample firm. In order to complete the missing information, we also utilized virtual information sources and social networking websites (e.g., [www.dirigeant.societe.com](http://www.dirigeant.societe.com) and [www.linkedin.com](http://www.linkedin.com)).

### Variables:

#### *Measures of firm performance*

##### *Tonin's Q (WQTOB)*

Prior studies on board gender diversity have either used accounting measure or market measure as performance indicators (Reguera-Alvarado et al., 2017). Following research by

Bennouri et al. (2018), Carter et al. (2010), Gordini and Rancati (2017), and Campbell & Mínguez-Vera (2008), this study includes one accounting measure and one market measure of firm performance. Generally speaking, Tobin's Q examines the expected value of a company as perceived by the market over the tangible assets value of the company (Sveiby, 1997). In this sense, a higher value of Tobin's Q is related with the presence of superior intangible assets related to the achievement of phenomenal financial performance. It is for this reason that Tobin's Q is widely used for measurement of financial performance in literature (Bennouri et al., 2018; Coles et al., 2008; Ferris et al., 2003; Fich & Shivdasani, 2007). It is related to market expectations and provides approximate projections about the future profitability (Montgomery & Wernerfelt, 1988). Tobin's Q (*WQTOB*) is measured as the total value of the stock plus the book value of liabilities, divided by the total assets of the firm:

$$\text{Tobin's } Q = \frac{\text{stock value} + \text{book value of liabilities}}{\text{Total assets}}$$

A value of less than 1.0 is an indication of the under-utilization of existing assets, and a value of more than 1.0 demonstrates that a firm has more potential to deploy its resources in an efficient way (Campbell & Mínguez-Vera, 2008). A greater value of Tobin's Q is indicative of superior knowledgeable assets that have the capacity to improve firm performance (Reguera-Alvarado et al., 2017). Another distinctive quality of Tobin's Q is its ability to cover intangible aspects such as brand perception, belief, and reputation (Jiao, 2010).

#### *Return on Assets (ROA)*

Literature on boardroom gender diversity widely uses the Return on Assets (ROA) as an indicator of firm performance (Adams & Ferreira, 2009; Bennouri et al., 2018; Campbell & Mínguez-Vera, 2008; Erhardt et al., 2003; Gordini & Rancati 2017; Kilic & Kuzey, 2016;

Shehata, Salhin, & El-Helaly, 2017; Ujunwa et al., 2012). ROA shows the ability of the corporate executives to efficiently consume the organization's resources that are provided by the shareholders (Kilic & Kuzey, 2016). Its value is directly linked to the efficiency of the management. Return of assets is calculated as:

$$ROA = \frac{\text{Net Income after Tax}}{\text{Total Asset}}$$

### *Measures of board gender diversity*

Following extant literature, we use four proxies to capture gender diversity on French boards. First, the proportion of females on a board (*WBOARD*) is defined as the percentage of female directors out of the total numbers of directors. Second, the number of females on a board (*NB\_WBOARD*) is the total number of female directors (Campbell & Mínguez-Vera, 2008; Gordini & Rancati, 2017; Kiliç & Kuzey, 2016; Shehata et al., 2017). Further, we choose two additional measures of board gender diversity to justify the symmetrical distribution of gender groups among boards of directors: the Shannon index of gender diversity and the Blau index of gender diversity (Campbell & Mínguez-Vera, 2008; Gordini & Rancati, 2017; Nekhili et al., 2020). Both indices were first introduced within the field of ecological economics to measure biodiversity in ecological economics, but have since also been used for other diversity measurements (Baumgartner, 2006; Campbell & Mínguez-Vera, 2008; De Fuentes et al., 2014; Gordini & Rancati, 2017; Shehata et al., 2017). The Shannon index is measured as:

$$\text{Shannon index} = - \sum_{i=1}^n P_i \ln (P_i)$$

Where  $P_i$  is the percentage of board members in each category (two: male/female) and  $n$  is the total number of board members. The index value ranges from 0 to 1, where the minimum

value of 0 indicates no diversity and the maximum value of 1 represents an equal proportion of males to females. Similarly, the Blau index is measured as:

$$\text{Blau index} = 1 - \sum_{i=1}^n P_i^2$$

Where  $P_i$  is the percentage of board members in each category (two: male/female) and  $n$  is the total number of board members. A scale of 0 to 0.5 is utilized, and the index reaches 0.5 when the proportion of men to women in the board is equal. The Shannon and Blau indices have similar properties, however the Shannon index is more sensitive to small differences in the gender composition in boards, as it is a logarithmic measure of diversity (Baumgartner, 2006).

*Control variables:*

In light of previous studies, we control for variables that are likely to affect the relationship between board gender diversity and firm performance. Guest (2009) note that larger boards provide a variety of opinions and diverse experiences among board members that increases the supervisory capacity of the board. Furthermore, a greater number of directors on a board provides access to greater resources and improves performance by creating positive firm value. Moreover, a greater number of directors on a board contribute to the knowledge capital by giving access to various dimensions of the business sector in a deeper way, which in turn improves the quality of strategic decision-making and therefore positively affects firm performance (Arosa, Iturralde, & Maseda, 2010). As such, we expect a positive relationship between board size (*LBSIZE*) and firm performance. In line with the previous research, we also anticipated a positive relationship between board independence (*BOARD\_IND*) and firm performance. Chau and Gray (2010) reported that independent boards make decisions more efficiently and diminish agency problems by monitoring and adjusting the opportunistic behavior of management (Fama & Jensen, 1983; Pucheta-

Martínez, & Pucheta-Martínez, 2020). Volonte (2015) states that independent directors act as an over-sight mechanism for a board, as they are likely to protect the interests of shareholders by providing independent and objective opinions. Board meetings (*LBMEET*) are indicative of board activity, and frequent board meetings indicate a proactive board. This is to say that frequent board meetings increase the board supervision that leads to improved firm performance (Liang, Xu, & Jiraporn, 2013). As such, we predict a positive relationship between board meeting frequency and firm performance.

We also control for audit committee variables, as they are also likely to impact firm performance. The higher the size of audit committee, the greater resources for supervising the financial process, thus improves firm performance (Lin & Hwang, 2010). We therefore expect audit committee size (*AUDCOM\_SIZE*) to positively influence firm performance of French firms. Prior empirical studies suggest audit committee independence positively affect firm performance (Abbott et al., 2004; Klein, 2002). Chan and Li (2008), and Al-Matar et al. (2012) found that audit committee independence improves firm performance by increasing the effective oversight capability of audit committee. We thus also predict a positive link between audit committee independence (*AUDCOM\_IND*) and performance of French firm. We measure audit committee meetings (*LACMEET*) as the natural logarithm of the frequency of audit committee meetings. Because audit committee monitors inside information and committee meetings are sources to disseminate the information among the stakeholders, audit committee meetings are indicators of actions of audit committee and are directly linked with performance (Lin, Li, & Yang, 2006; Xie et al., 2003). Al-Matar et al. (2012) report a positive connection between audit committee meetings and firm performance. Knowing this, we too expect a positive link between audit committee meetings (*LACMEET*) and firm performance.



CEO Duality (*DUAL*) is predicted to negatively affect firm performance. In dual leadership positions (i.e., CEO and board chair), power is highly concentrated, leaving less room for accountability and therefore negatively impacting firm performance (Bhagat & Bolton, 2008; Carter et al., 2003). We similarly expect a negative link between CEO tenure (*LCEOTEN*) and firm performance, as CEOs having longer tenure can create entrenched positions that pursue personal interest, ultimately harming corporate performance (Mrock, Shelfier, & Vishny, 1988; Ryan & Wiggins, 2001). Conversely, the presence of female CEOs (*WCEO*) is anticipated to be positively related with firm performance. Females adopt a democratic leadership style and believe in interaction and feedback compared to the authoritative style adopted by male chairs (Eagly & Carli, 2003; Peni, 2014). The interactive approach of female chairs helps in improving decision precision and ultimately adds positively towards firm performance in French firms (Nekhili et al., 2018).

Archival literature in corporate governance document that firm performance is also influenced by the ownership structure (Adams & Ferreira, 2009; La Porta et al., 1998; Post & Byron, 2015). In the French context, extant literature document mixed results regarding the influence of ownership structure on firm performance. Bennouri et al. (2018) found that both ownership variables (family and institutional) are positively linked with firm performance. However, Charfeddine and Elmarzougui (2003) report negative impact of institutional ownership on the performance of French firms. We thus decided to control for family ownership (*FAM\_OWN*) and institutional ownership (*INST\_OWN*). Corporate debt (*WDEBT*) impacts its bankruptcy risk, tax benefits, and creditor monitoring. Theoretically, it is negatively linked with firm performance (Bennouri et al., 2018; Terjesen et al., 2016). Given the findings of Adams and Ferreira (2009), Bennouri et al. (2018) and Erhardt et al. (2003), we expect a positive link between firm complexity measures and firm performance. Cross-listing (*CROSS*) across different countries provides access to foreign sources of financing

(Reese & Weisbach, 2002). Finally, in line with prior literature, we also control for firm size (*LNASSETS*). Larger firms are associated with higher performance (Smith et al., 2005) and greater market value (Mitton, 2002), and therefore we anticipate a positive link between firm size and performance.

### **Model specification**

The link between female directorship and firm performance is prone to be impacted by firm characteristics (observable as well as unobservable) that affect gender diversity and firm performance concurrently. Consequently, we consider female directorships and firm performance as endogenous variables. In order to appropriately control for systematic differences arising from observable characteristics, we applied Propensity Score Matching (PSM) techniques, as suggested by Rosenbaum and Rubin (1983). In an effort to alleviate concerns regarding endogeneity arising from various sources, we apply system GMM regression (Arellano & Bover, 1995; Blundell & Bond, 1998). This regression method estimates the association between female directorship and performance in both levels and first differences simultaneously. The system GMM estimation technique mitigates the concerns of heterogeneous endogeneity (related to time-invariant variables) by estimating both the level and difference equations at the same time. The lagged values included in the model perform the role of internal exogenous instruments. Bennouri et al. (2018) noted that the rationale for using the lagged values is based on the notion that the appointment of female directors is also dependent on both the past and current performance of the firm, as well as on specific firm characteristics (e.g., size, governance and ownership structure).

We examine the validity of the system GMM estimations by testing autocorrelations of endogenous (our measures of boardroom gender diversity) and dependent variables (our measures of firm performance). We test the dynamic specifications of these variables by using the Arellano and Bond (1991) autocorrelation test. The reported results support our

rationale for selecting the system GMM as our primary estimation technique, as this technique performs better in the presence of first-order serially-correlated processes (Roodman, 2009a). While generating the system GMM estimations, proliferation of instruments is another key issue that should be carefully considered. In system GMM models, each explanatory variable provides instruments associated with lagged and difference values. These instruments become weak as the number of explanatory variables increases (Roodman 2009b). Therefore, two standard specifications, the Sargan test and the Hansen test, are also carried and the results of these tests are displayed in tables presenting the system GMM estimates.

In recent years, the system GMM method has been widely used by researchers in the field of economics, corporate finance and corporate governance (Wintoki et al., 2012). For instance, Pathan and Faff (2013) used this method to study the link between board structure and bank performance. Reguera-Alvarado et al. (2015) also applied the system GMM technique to study the link between gender diversity and performance of Spanish firms. Nekhili et al. (2020) used the system GMM technique to study the effect of board gender diversity on audit fees, as did Nekhili, Javed, and Nagati (2021) to study the role of gender-diverse audit partners in curbing earnings management. We test our first hypothesis using the model given in Equation (1):

$$\begin{aligned} Performance = & \beta_0 + \beta_1 Lag\ Performance + \beta_2 WBOARD + \beta_3 LBSIZE + \beta_4 BOARD\_IND \\ & + \beta_5 LBMEET + \beta_6 AUDITCOM\_SIZE + \beta_7 AC\_IND + \beta_8 LACMEET \\ & + \beta_9 DUAL + \beta_{10} LCEOTEN + \beta_{11} WCEO + \beta_{12} FAM\_OWN \\ & + \beta_{13} INST\_OWN + \beta_{14} WDEBT + \beta_{15} WRD + \beta_{16} CROSS + \beta_{17} LNASSETS \\ & + \beta_{18} YEAR + \beta_{19} INDUSTRY + \mathcal{E}_{it} \end{aligned} \quad (1)$$

Where  $\mathcal{E}_{it}$  is the error term. *Performance* is our dependent variable, and it represents accounting and market-based measures of performance (namely ROA and Tobin's Q).

*WBOARD* is our variable of interest, and it represents our measures of board gender diversity. We followed the leads of Campbell and Mínguez-Vera (2008), Gordini and Rancati (2017), and Nekhili et al. (2020) to understand the effect of boardroom gender diversity and used a range of four alternative measures: the proportion of female board members (*WBOARD*), number of female board members (*NB\_WBOARD*), the Blau index of gender diversity (*BLAU*) and the Shannon index of gender diversity (*SHANNON*). Several firms' characteristics are also included in our model, and these variables are defined in Table 1.

In second hypothesis, we argue that the positive link between board gender diversity and firm performance is enhanced by gender quota law. Here, our objective is to measure the marginal effects of the presence of female board members (*WBOARD*) on firm performance after the enactment of gender quota legislation (*QUOTA*). To do so, we carry out the joint test of the sum of the coefficients on *WBOARD* and *WBOARD* × *QUOTA* using the difference-in-differences technique.<sup>7</sup> Therefore, we estimate the model provided in the following equation:

$$\text{Performance} = \beta_0 + \beta_1 \text{Lag Performance} + \beta_2 \text{WBOARD} + \beta_3 \text{QUOTA} + \beta_4 (\text{WBOARD} \times \text{QUOTA}) + \beta_5 \text{CONTROL} + \beta_6 \text{INDUSTRY} + \varepsilon_{it} \quad (2)$$

Where the dependent variable (*performance*) represents accounting (ROA) and market-based measures (Tobin's Q) of performance, *WBOARD* represents the proportion of female board members.  $\varepsilon_{it}$  is the error term, and *CONTROL* is a vector of control variables that may differ across firms (*LBSIZE*, *BOARD\_IND*, *LBMEET*, *AUDITCOM\_SIZE*, *AC\_IND*, *LACMEET*, *DUAL*, *LCEOTEN*, *WCEO*, *FAM\_OWN*, *INST\_OWN*, *WDEBT*, *WRD*, *CROSS*, and *LNASSETS*). All variables are defined in Table 1.

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<sup>7</sup> The difference-in-differences technique is used to estimate the differential effects of a treatment/event on the treatment group by treating each observation as its own control (Donald & Lang, 2007). It is thus a method to mitigate the concern of extraneous factors or selection biases and also control for random causes of variations in the dependent variable over time (Nekhili, Javed, & Chtioui, 2018).

Furthermore, examining the effectiveness of board gender diversity with regard to firm performance requires going beyond the mere presence of female on board and necessitates examining the roles played by female directors on corporate boards. In the context of board gender quota legislation, the effectiveness of mandatory reforms requires investigating the strategic roles and committee memberships assigned to female directors, as the roles played by female directors will shape the effect of regulatory changes on corporate governance and firm performance (Reberioux & Roudaut, 2016). With this in mind, our hypotheses 3a, 3b and 3c intend to study the effects of positions assigned to female directors on firm performance and how this relationship is moderated by the promulgation of gender quota legislation. Following Nekhili et al. (2020), we considered three positions of female directors: female inside directors (working on the board only), female directors appointed as independent directors, and female audit committee members. According to the MEDEF-AFEP governance code report published in July 1999, inside directors are current managers, retired managers, or individuals linked to the owning family or executive directors. Independent directors are defined as outside directors who are not associated with firm managers or shareholders. To study the effect of the position of female directors on firm performance, we use the model given in equation 3:

$$\begin{aligned} Performance = & \beta_0 + \beta_1 Lag\ Performance + \beta_2 WBOARD + \beta_3 CONTROL \\ & + \beta_4 INDUSTRY + \epsilon_{it} \end{aligned} \quad (3)$$

Where the dependent variable (*performance*) represents accounting (ROA) and market-based measures (Tobin's Q) of firm performance, *WBOARD* represents the positions assigned to female directors (the proportion of female inside directors (*WBOARDINSIDE*), the proportion of female non-executive independent directors (*WBOARDIND*), and the proportion of female audit committee members (*WBOARDAUDC*).  $\epsilon_{it}$  is the error term, and *CONTROL* is a vector of control variables that may differ across firms (*LBSIZE*, *BOARD\_IND*, *LBMEET*,

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*AUDITCOM\_SIZE*, *AC\_IND*, *LACMEET*, *DUAL*, *LCEOTEN*, *WCEO*, *FAM\_OWN*, *INST\_OWN*, *WDEBT*, *WRD*, *CROSS*, and *LNASSETS*). All variables are defined in Table 1.

We also used the difference-in-differences technique to study the marginal effect of gender quota law on the link between the position of female board members and performance of French firms in the period following the enactment of quota legislation by carrying out the joint test of the sum of the coefficients on *WBOARD* and *WBOARD* × *QUOTA*:

$$\begin{aligned} Performance = & \beta_0 + \beta_1 Lag\ Performance + \beta_2 WBOARD + \beta_3 QUOTA + \beta_4 (WBOARD \times \\ & QUOTA) + \beta_5 CONTROL + \beta_6 INDUSTRY + \varepsilon_{it} \end{aligned} \quad (4)$$

Where the dependent variable (*performance*) represents accounting (ROA) and market-based measures (Tobin's Q) of firm performance, *WBOARD* represents the positions assigned to female directors (the proportion of female inside directors (*WBOARDINSIDE*), the proportion of female non-executive independent directors (*WBOARDIND*), and the proportion of female audit committee members (*WBOARDAUDC*).  $\varepsilon_{it}$  is the error term, and CONTROL is a vector of control variables that may differ across firms (*LBSIZE*, *BOARD\_IND*, *LBMEET*, *AUDITCOM\_SIZE*, *AC\_IND*, *LACMEET*, *DUAL*, *LCEOTEN*, *WCEO*, *FAM\_OWN*, *INST\_OWN*, *WDEBT*, *WRD*, *CROSS*, and *LNASSETS*). All variables are defined in Table 1.

**Table 1: Definition of variables**

<b>Variable</b>	<b>Definition</b>	<b>Measure<sup>a</sup></b>
<b><u>Dependent Variables:</u></b>		
<i>WROA</i>	Return on Assets	Ratio of operating income to total expenses.
<i>WQTOB</i>	Tobin's Q	Stock market capitalization plus book value of liabilities as ratio of total assets.
<b><u>Endogenous variables:</u></b>		
<i>WBOARD</i>	Proportion of female directors	Percentage of female directors to total number of board directors.
<i>NB_WBOARD</i>	Number of female directors	Total number of female directors.
<i>SHANNON</i>	Shannon diversity index	$= - \sum_{i=1}^n P_i \ln(P_i)$ where $P_i$ is the percentage of board members in each category (two: male/female) and $n$ is the total number of board members
<i>BLAU</i>	Blau diversity index	$= 1 - \sum_{i=1}^n P_i^2$ where $P_i$ is the percentage of board members in each category (two: male/female) and $n$ is the total number of board members.
<i>WBOARDINSIDE</i>	Female inside directors	Percentage of female executive (retired or existing or related to owing family) to total number of executive directors
<i>NB_WINSIDE</i>	Number of female inside directors	Number of female executive (retired or existing or related to owing family) to total number of executive directors
<i>WBOARDIND</i>	Female Independent directors	Percentage of non-executive female independent directors to total number of non-executive independent directors.
<i>NB_WIND</i>	Number of female independent directors	Total number of female independent directors
<i>WBOARDAUDC</i>	Proportion of female on Audit committee	Percentage of female audit committee members to total number of audit committee members.
<i>NB_WAUD</i>	Number of female audit committee members	Total number of female audit committee members
<b><u>Moderating Variable:</u></b>		
<i>QUOTA</i>	Quota Law	Dummy variable equal to one after adoption of board gender quota law in 2011 and zero otherwise.
<b><u>Control Variables:</u></b>		
<i>LBSIZE</i>	Board size	Natural logarithm of the total number of directors.
<i>BOARD_IND</i>	Board independence	Ratio of non-executive independent directors to total number of directors.
<i>LBMEET</i>	Board meeting frequency	Natural logarithm of the number of board meeting.
<i>AUDITCOM_SIZE</i>	Audit committee size	Total number of audit committee members
<i>AC_IND</i>	Audit committee independence	Ratio of non-executive independent audit committee members to total number of audit committee members.
<i>LACMEET</i>	Audit committee meeting frequency	Natural logarithm of the number of audit committee meeting.
<i>DUAL</i>	CEO duality	Dummy variable coded "1" if the CEO serves as board Chair and "0" otherwise.
<i>LCEOTEN</i>	CEO tenure	Number of years served at the company before becoming CEO.
<i>WCEO</i>	Female CEO	Dummy variable coded "1" if the CEO is a female and "0" otherwise.
<i>FAM_OWN</i>	Family ownership	Percentage of capital held by family investors.
<i>INST_OWN</i>	Institutional ownership	Percentage of capital held by institutional investors.
<i>WDEBT</i>	Debt	Ratio of financial debt to total assets.
<i>WRD</i>	Research and Development	Ratio of R&D investment to total assets.
<i>CROSS</i>	Cross listing	Firms simultaneously listed in France and the USA.
<i>LNASSETS</i>	Firm size	Natural logarithm of firm's total assets.
<i>Industry</i>	Industry	A binary variable coded "1" if the company belongs to the sector in question "0" otherwise

<sup>a</sup> Variables from ThomsonOne are winsorized at the 1% and 99% levels.

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### Descriptive statistics:

Table 2 contains descriptive statistics for all of the variables for the aggregate sample of 1,610 firm-year observations. In this study, we use two measures to capture corporate performance. The mean value of our accounting-based measure of firm performance (*WROA*) is 4.70%, and it varies considerably from (minimum) -13.99% to (maximum) 21.22%. Similarly, the mean value of our market-based measure of firm performance (*WQTOB*) is 1.19. These statistics are considerably different from prior French sample-based studies (e.g., Ahmadi & Bouri, 2017; Bennouri et al., 2018; Sabatier, 2015). A possible explanation for this difference is that our study is based on the SBF 120 index, whereas the other studies have used either the CAC all share index or the CAC 40 index for their analyses.

Regarding board gender diversity variables, the overall percentage of women on French boards (*WBOARD*) is 20.56% within our sample. Similarly, the average number of women on board (*NB\_WBOARD*) is 2.55, and it varies from 0 to a maximum of 9 members. The presence of slightly more than 2.5 women on French corporate boards suggests that female directors still represent less than the critical mass of 3 directors, an ideal number identified by Erkut et al. (2009) that is necessary for any minority group to make a noteworthy contribution in any organization. The mean value of the Shannon index of diversity (*SHANNON*) is 0.409, and the mean value of the Blau index of diversity (*BLAU*) is 0.272; similar statistics were reported by Nekhili et al. (2020), who also used SBF 120 index listed firms for an analysis of audit fees and gender quota law. In terms of the positions of female board members on French boards, we find that overall female inside directors (*WBOARDINSIDE*) are 7.89% and the mean number of



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female inside directors (*NB\_WINSIDE*) is slightly less than 1. Similarly, in our sample the mean percentage of female independent directors (*WBOARDIND*) is 12.68% and the mean number of female independent directors (*NB\_WIND*) is 1.57, with a maximum of 8 female independent directors. The overall percentage of female audit committee members (*WBOARDAUDC*) is 21.81%. The mean number of women on the audit committee (*NB\_WAUD*) is 0.86, suggesting that there is less than one female director on each audit committee.

With regard to corporate governance variables, we note that the board size (*LBSIZE*) ranges from 4 to 26 members, with an average of 12.31 members. On average (mean), 48.69% members of corporate boards are independent directors (*BOARD\_IND*), and French corporate boards meet (*LBMEET*) 7 times per year. The average audit committee size (*AUDITCOM\_SIZE*) is 3.80 members, ranging from 2 to 10 members. The mean proportion of independent board members on the audit committee (*AC\_IND*) is 67.92%, and the members of the audit committee met (*LACMEET*) on average 4.65 times in a year. The average (mean) CEO/Chairperson duality (*DUAL*) is 57.08%, and the average CEO tenure (*LCEOTEN*) is slightly more than 8 years. In our sample, merely 1.53% of firm-years have women CEOs (*WCEO*). We find that 24.71% of our sample firms are family-owned (*FAM\_OWN*), whereas 27.96% of the sample firms are owned by Institutional investors (*INST\_OWN*). On average, the debt ratio (*WDEBT*) is 23.38% and R&D expenditures are 2.49% of the sales proceeds. 25.61% of our sample firms are listed in foreign countries (*CROSS*). Finally, the average firm size measured in terms of total assets (*LNASSETS*) is €20.21 billion. Overall, these statistics are relatively similar to those reported by Bennouri et al. (2018) and Nekhili et al. (2020) in French setting.

Table 2: Descriptive statistics

Variable	Mean	Standard Deviation	Minimum	Maximum	25th percentile	50th percentile	75th percentile
<i>WROA</i>	4.70	4.92	-13.99	21.22	2.31	4.29	6.89
<i>WQTOB</i>	1.19	1.07	0.25	6.99	0.61	0.86	1.34
<i>WBOARD %</i>	20.56	16.55	0	63.64	6.67	18.18	33.33
<i>NB_WBOARD</i>	2.55	2.20	0	9	1	2	4
<i>SHANNON</i>	0.41	0.25	0	0.69	0.25	0.47	0.64
<i>BLAU</i>	0.27	0.18	0	0.50	0.12	0.29	0.44
<i>WBOARDINSIDE %</i>	7.89	9.54	0	0.50	0	6.25	12.50
<i>NB_WINSIDE</i>	0.98	1.23	0	6	0	1	1
<i>WBOARDIND %</i>	12.68	14.16	0	0.56	0	8.33	22.22
<i>NB_WIND</i>	1.57	1.81	0	8	0	1	3
<i>WBOARDAUDC %</i>	21.81	24.72	0	1	0	2.00	33.33
<i>NB_WAUD</i>	0.86	1.01	0	5	0	1	1
<i>LBSIZE (number of directors)</i>	12.31	3.38	4	26	10	12	15
<i>BOARD_IND %</i>	48.69	20.95	0	1	36.36	46.67	62.67
<i>LBMEET (number of meetings)</i>	7.10	3.09	0	24	5	7	9
<i>AUDITCOM_SIZE (number of members)</i>	3.80	1.13	2	10	3	4	4
<i>AC_IND %</i>	67.92	27.21	0	1	0.5	0.67	1
<i>LACMEET (number of meetings)</i>	4.65	2.16	0	19	3	4	6
<i>DUAL (%)</i>	57.08	0.50	0	1	0	1	1
<i>LCEOTEN (number of years)</i>	8.14	7.29	0	50	3	6	11
<i>WCEO (%)</i>	1.53	12.27	0	1	0	0	0
<i>FAM_OWN (%)</i>	24.71	25.99	0	99.37	0	0.17	46.74
<i>INST_OWN (%)</i>	27.96	29.21	0	95.31	0	0.18	48.30
<i>WDEBT (%)</i>	23.38	13.86	0.11	62.28	13.61	21.68	31.62
<i>WRD (%)</i>	2.49	4.73	0	25.90	0	0.12	3.25
<i>CROSS (%)</i>	25.61	43.66	0	1	0	0	1
<i>LNASSETS (billions of euros)</i>	20.21	34.76	0.47	303.3	23.18	68.90	246.7

This table reports descriptive statistics for performance measures (ROA, Tobin's Q), diversity measures (proportion, number of female directors, Shannon index and Blau index) and control variables for a sample containing French listed firms of SBF 120 index. All foreign, financial, real estate and firms with missing data are eliminated. The final sample contains unbalanced panel data of 1610 firm-year observations for 97 French firms for the period between 2001 and 2019. All variables are as defined in Table 1.

*Trend analysis of female directorship*

Table 3 presents the yearly variation in the board size, the proportion of female board members on French corporate boards and multiple variables capturing the position of female board members (i.e., the proportion of female inside directors, female independent directors, and female audit committee members). The tendency of French firms to appoint female directors varies considerably during the sample period. Particularly, since the enactment of the Cope-Zimmerman law in 2011, the overall proportion of female directors (*WBOARD*) grew significantly, and it appears that French firms comply with the requirements of the Cope-Zimmerman law. Noticeably, the board size (*LBSIZE*) does not change. These results indicate that the French boards have appointed new female directors by replacing the male directors rather than by increasing the number of their corporate board members. Our findings negate the fears of additional costs associated with the appointment of female directors by increasing board size and such increase in financial burden may negatively affect firm performance (Voß, 2015). Similarly, an upward trend is also observed for the variables capturing the positions of female board members: the female inside directors (*WBOARDINSIDE*), the female independent directors (*WBOARDIND*) and the female audit committee members (*WBOARDAUDC*). It is evident from the results that the number of female independent directors and female audit committee members grew substantially over the years as compared to female inside directors. This distinctive upward trend is more pronounced from 2011 onward due to the ratification of the mandatory gender quota legislation. It is further evident from reported results that the tendency of French firms to appoint female independent directors is inversely related to the appointment of female inside directors; in other words, in the wake of gender quota legislation, firms have swapped the appointment of the female inside directors with the appointment of female independent directors. Likewise, the proportion of female directors as audit committee members

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(*WBOARDAUDC*) has substantially increased over the years as the result of gender quota legislation. Contrary to the findings of Choudhury (2015) and Smith (2018), which suggest that mandatory reforms are likely to promote female tokenism on boards, our results suggest that female directors on French corporate boards have been appointed to important monitoring positions in the post-quota period. These results also negate Bolshaw (2011), who suspect that firms may appoint token female directors simply for the compliance with a mandatory law, without any affiliation with the board. Our findings demonstrate that in compliance with mandatory gender quota law, firms have not only appointed female directors to boards, but also have assigned them important board positions (i.e., audit committee members and independent directors). Our findings reveal the success of mandatory gender quota law in breaking the long prevailing glass ceiling (Nekhili & Gatfaoui, 2013) and positional gender segregation (Reberioux & Roudaut, 2016) for female directors who qualify for top board positions.

In order to statistically evaluate the occurrence of trends for presence of females on boards and positions of female board members, we conducted a Mann–Kendall test; the null hypothesis of no trend over time was rejected for each of these variables.

**Table 3: Trend of female directorship**

Year	LBSIZE	WBOARD (%)	WBOARDINSIDE	WBOARDIND	WBOARDAUDC
2001	13	5.03	3.29	2.13	2.37
2002	12.51	6.07	4.00	2.67	2.89
2003	12.37	6.22	3.78	2.44	3.59
2004	12.13	6.71	4.51	2.20	4.49
2005	12.05	6.73	4.46	2.18	5.65
2006	11.67	7.02	4.55	2.38	6.07
2007	11.55	7.93	4.89	3.04	8.65
2008	11.90	8.01	4.69	3.33	9.61
2009	11.84	9.05	5.36	3.69	11.35
2010	12.42	12.64	6.60	6.04	15.39
2011	12.45	18.03	8.12	9.81	18.75
2012	12.46	21.31	8.57	12.73	23.21
2013	12.39	26.82	10.48	16.27	28.15
2014	12.61	31.57	11.01	20.41	32.77
2015	12.36	34.38	11.23	23.02	34.21
2016	12.52	40.55	12.11	28.20	41.32
2017	12.79	41.31	12.49	28.78	46.50
2018	12.85	41.80	12.43	29.36	48.10
2019	12.87	42.06	12.41	29.69	49.48
Total	12.31	20.56	7.89	12.67	21.81
Analysis of variance for mean difference test : F-value ( <i>p</i> -value)	1.22 (0.235)	236.06 (0.000)*	12.86 (0.000)*	122.86 (0.000)*	67.27 (0.000)*
Mann–Kendall test: Z-value ( <i>p</i> - value):	6.12 (0.000)*	32.98 (0.000)*	14.10 (0.000)*	30.35 (0.000)*	26.85 (0.000)*

This table provides yearly variation in the board size, proportion of female directors, female inside directors (working on board only), female independent directors and female audit committee members. \* denotes significance of results at the 0.01 level.

*Matrix of pairwise correlation*

Table 4 contains the pairwise correlation matrix for the variables employed in our study. Our accounting-based measure of firm performance (*WROA*) appear to correlate positively with all four measures of board gender diversity (i.e., the proportion of female board members, the number of female board members, and the Shannon and Blau indices), albeit significantly only for the proportion of female board members. This provides preliminary support for our first hypothesis, as it indicates that gender diversity on corporate boards enhances firm performance in terms of profitability. However, the correlation coefficient for our market-based measure of firm performance (*WQTOB*) appears to be positive with respect to the proportion of female directors on board (*WBOARD*), but negative with respect to the other three measures of board gender diversity, thus contradicting what we posited in H1. This indicates that board gender diversity may negatively affect stock market participants in France. Regarding the positions of female directors, female inside directors (*WBOARDINSIDE*) are negatively correlated with *WROA*, whereas the other two variables capturing the position of female directors (independent directors and audit committee membership) are positively correlated with *WROA*. Interestingly, the presence of female inside directors (*WBOARDINSIDE*) and female audit committee membership (*WBOARDAUDC*) correlate positively with *WQTOB*, though the presence of female independent directors (*WBOARDIND*) is negatively correlated with *WQTOB*.

For control variables, our board and audit committee-related variables (i.e., size, independence and meeting frequency) correlate negatively with firm performance. The duality of the CEO/chairperson (*DUAL*) is negatively related to our firm performance measures, and CEO tenure (*LCEOTEN*) is positively related to firm performance. While family ownership (*FAM\_OWN*) is positively correlated with firm performance, institutional

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ownership (*INST\_OWN*) demonstrates a negative correlation with both measures of firm performance.

Although some variables capturing female representation on board are significantly correlated with each other, the magnitude of the correlation coefficients of other variables is below the critical value of 0.6, indicating the absence of multicollinearity. In addition, we also check the value for the Variance Inflation Factors (VIF) of the full variable range is less than the critical threshold of 10, at which multicollinearity may pose potential issues for our results. Thus, the results demonstrate absence of multicollinearity issue in our data.

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**Table 4: Pairwise correlation matrix**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	VIF
1. <i>WROA</i>	1.000											
2. <i>WQTOB</i>	0.412*	1.000										
3. <i>WBOARD</i>	0.066*	0.015	1.000									1.15
4. <i>NB_WBOARD</i>	0.052	-0.057	0.923*	1.000								1.28
5. <i>SHANNON</i>	0.042	-0.012	0.938*	0.870*	1.000							1.13
6. <i>BLAU</i>	0.050	-0.002	0.967*	0.896*	0.993*	1.000						1.14
7. <i>WBOARDINSIDE</i>	-0.042	0.036	0.521*	0.484*	0.530*	0.530*	1.000					1.15
8. <i>NB_WINSIDE</i>	-0.034	-0.038	0.493*	0.568*	0.503*	0.504*	0.929*	1.000				1.21
9. <i>WBOARDIND</i>	0.105*	-0.007	0.819*	0.753*	0.740*	0.773*	-0.064*	-0.049	1.000			1.18
10. <i>NB_WIND</i>	0.086*	-0.043	0.786*	0.828*	0.714*	0.746*	-0.044	0.010	0.948*	1.000		1.24
11. <i>WBOARDAUDC</i>	0.006	0.044	0.671*	0.618*	0.630*	0.650*	0.403*	0.378*	0.513*	0.494*	1.000	1.13
12. <i>NB_WAD</i>	0.011	0.003	0.649*	0.656*	0.611*	0.631*	0.384*	0.410*	0.499*	0.518*	0.912*	1.30
13. <i>LBSIZE</i>	-0.051	-0.196*	0.034	0.331*	0.069*	0.052	0.037	0.267*	0.015	0.221*	0.036	1.47
14. <i>BOARD_IND</i>	-0.075*	-0.115*	0.146*	0.094*	0.137*	0.145*	-0.108*	-0.142*	0.243*	0.211*	0.105*	1.94
15. <i>LBMEET</i>	-0.059	0.039	0.134*	0.137*	0.126*	0.131*	0.013	0.019	0.148*	0.153*	0.076*	1.27
16. <i>AUDITCOM_SIZE</i>	-0.038	-0.079*	0.093*	0.206*	0.112*	0.105*	0.059	0.157*	0.069*	0.143*	0.105*	1.36
17. <i>AC_IND</i>	-0.041	-0.029	0.145*	0.114*	0.132*	0.138*	-0.024	-0.048	0.186*	0.170*	0.135*	1.68
18. <i>LACMEET</i>	-0.045	-0.045	0.144*	0.185*	0.151*	0.153*	0.036	0.069*	0.144*	0.178*	0.141*	1.39
19. <i>DUAL</i>	-0.079*	-0.110*	0.069*	0.112*	0.073*	0.074*	0.040	0.078*	0.054	0.083*	0.053	1.07
20. <i>LCEOTEN</i>	0.012	0.074*	0.228*	0.178*	0.193*	0.206*	0.181*	0.150*	0.145*	0.114*	0.244*	1.18
21. <i>WCEO</i>	-0.248*	0.041	0.039	-0.029	0.045	0.048	0.140*	0.046	-0.048	-0.066*	0.018	1.06
22. <i>FAM_OWN</i>	0.247*	0.207*	-0.077*	-0.110*	-0.084*	-0.082*	0.080*	0.029	-0.144*	-0.153*	-0.076*	1.67
23. <i>INST_OWN</i>	-0.113*	-0.175*	0.123*	0.166*	0.131*	0.132*	-0.059	-0.009	0.183*	0.208*	0.090*	1.43
24. <i>WDEBT</i>	-0.111*	-0.131*	-0.091*	-0.096*	-0.057	-0.068*	-0.076*	-0.080*	-0.054	-0.062	-0.028	1.09
25. <i>WRD</i>	0.032	0.183*	-0.002	-0.035	-0.026	-0.013	-0.087*	-0.105*	0.056	0.029	0.011	1.13
26. <i>CROSS</i>	-0.064	-0.043	-0.001	0.040	-0.013	-0.012	0.128*	0.137*	-0.087*	-0.045	0.056	1.12
27. <i>LNASSETS</i>	-0.076*	-0.170*	0.050	0.174*	0.071*	0.064*	0.083*	0.207*	0.003	0.071*	0.039	1.38

This table reports pairwise correlation matrix and VIF scores of the variables used in our study. \* represents significance at the 1 percent level. All variables are as defined in Table 1.



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Pairwise correlation matrix (continued)

	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
12. NB_WAD	1.000											
13. LBSIZE	0.155*	1.000										
14. BOARD_IND	0.117*	-0.167*	1.000									
15. LBMEET	0.108*	0.051	0.038	1.000								
16. AUDITCOM_SIZE	0.394*	0.358*	0.009	0.098*	1.000							
17. AC_IND	0.079*	-0.087*	0.578*	-0.007	-0.149*	1.000						
18. LACMEET	0.197*	0.180*	0.097*	0.413*	0.222*	0.087*	1.000					
19. DUAL	0.064*	0.144*	-0.119*	0.019	0.026	-0.068*	0.001	1.000				
20. LCEOTEN	0.132*	-0.013	-0.021	-0.041	-0.173*	0.143*	-0.082*	0.142*	1.000			
21. WCEO	-0.012	-0.162*	0.080*	0.012	-0.093*	0.055	-0.060	-0.013	0.090*	1.000		
22. FAM_OWN	-0.131*	-0.177*	-0.362*	-0.232*	-0.221*	-0.140*	-0.259*	-0.024	0.085*	0.066*	1.000	
23. INST_OWN	0.151*	0.110*	0.342*	0.065*	0.229*	0.175*	0.124*	0.009	-0.037	-0.071*	-0.484*	1.000
24. WDEBT	-0.026	0.009	0.045	0.055	0.035	-0.050	0.096*	-0.028	-0.107*	-0.080*	-0.160*	0.008
25. WRD	-0.014	-0.121*	0.020	0.109*	-0.028	0.090*	0.136*	-0.033	0.047	-0.042	0.110*	-0.034
26. CROSS	0.077*	0.141*	0.113*	0.098*	0.128*	0.130*	0.176*	-0.080*	-0.063	-0.073*	-0.167*	0.099*
27. LNASSETS	0.138*	0.416*	0.004	0.192*	0.319*	-0.004	0.283*	0.010	-0.115*	-0.071*	-0.283*	0.116*

  

	(24)	(25)	(26)	(27)
24. WDEBT	1.000			
25. WRD	-0.141*	1.000		
26. CROSS	0.081*	0.123*	1.000	
27. LNASSETS	0.014	-0.0170	0.158*	1.000

*Propensity score matching*

Prior literature suggests that firms having gender diverse boards could be structurally different from the firms with all-male boards. For instance, mandatory gender quota reforms created more job market opportunities for experienced female directors, where incumbent female directors could be able to “cherry pick” the boards on which they sit (Ferreira et al., 2017). In such a scenario, experienced and qualified directors may choose the corporate boards of high performing firms, and our variable of interest (boardroom gender diversity) can reflect the observable firm-specific attributes rather than the effect of female board members. This is to say that the potential effect of gender diversity on corporate performance could be driven by firm-specific factors that simultaneously affect the female board members’ appointment and corporate performance. In order to find systematic differences in our sample firms, we use the mean difference test to compare firm-specific characteristics of firm-years with higher than the median proportion of female board members (828) and firm-years with lower than median proportion of female board members (782), shown in Table 5. We reported substantial differences between these subsamples, as firms with higher than the median proportion of female board members have more independent boards (*BOARD\_IND*) and higher numbers of board meetings (*LBMEET*). Similarly, such firms also have significantly larger audit committees (*AUDITCOM\_SIZE*) with more independent members (*AC\_IND*). Within our sample, firms with a high proportion of female board members are more likely to have CEO/Chairperson duality (*DUAL*), longer CEO tenure (*LCEOTEN*), and female CEOs (*WCEO*). With regard to ownership structure, we find that firms with a high proportion of female directors are less likely to be family-owned (*FAM\_OWN*) and more likely to have institutional ownership (*INST\_OWN*). We do not observe any substantial difference in research and

development (*WRD*) expenditures, cross listing (*CROSS*), firm size (*LNASSETS*), or board size (*LBSIZE*) within either subsample. Ultimately, the results reported in Table 5 demonstrate that a higher proportion of female board members positively contribute to firm performance (albeit not significantly for *WQTOB*).

In order to appropriately control for systematic differences, we applied Propensity Score Matching (PSM) techniques, as suggested by Rosenbaum and Rubin (1983). According to Roberts and Whited (2013), the matching procedure does not depend on an overt mean of identification of exogenous variables. In our study, a binary dependent variable is used in which a value of 1 indicate firm-years with a proportion of female directors that was higher than the median (treatment group) and a value of 0 to indicate firm-years with a proportion of female directors that was lower than the median (control group). First, we estimated a logit model to generate the propensity scores of the projected probability for each firm given a vector of all governance, ownership, and control variables used in our study. We then matched each firm with a higher-than-median proportion of female board members with a set of control firms (those with a lower-than-median proportion of female board members) having almost similar features (i.e., closest predicted propensity scores). We utilized the caliper matching technique, which describes maximum propensity score variations, to choose matched firms. Specifically, we adjusted the condition of caliper distance to 0.01 without replacement. By applying this matching procedure, we obtained a matched sample of 1102 observations, composed of 551 treatment observations and 551 controlled observations. The results are presented in Table 5 (the matched sample column). All imbalances of the observed covariates between the two subsamples became insignificant after applying the matching procedure.

**Table 5: Mean difference test between firm-years with high proportion of female directors and firm-years with low proportion of female directors for entire and matched samples**

Variable	Entire Sample			Matched Sample		
	Firm-years with high proportion of female directors ( <i>n</i> = 828)	Firm-years with low proportion of female directors ( <i>n</i> = 782)	t-test/Chi <sup>2</sup> <sup>a</sup>	Treatment group ( <i>n</i> = 551)	Control group ( <i>n</i> = 551)	t-test/Chi <sup>2</sup> <sup>a</sup>
<i>WROA</i>	4.91	0.05	1.67*	4.95	4.51	1.44
<i>WQTOB</i>	1.20	1.17	0.62	1.26	1.17	1.31
<i>LBSIZE</i> (number of directors)	12.38	12.31	0.42	12.44	12.27	0.84
<i>BOARD_IND</i> %	52.42	45.02	7.18***	48.26	48.53	-0.22
<i>LBMEET</i> (number of meetings)	7.48	6.76	4.71***	6.99	6.99	0.03
<i>AUDITCOM_SIZE</i> (number of members)	0.59	0.55	1.65*	0.58	0.57	0.37
<i>AC_IND</i> %	9.43	6.72	7.59***	7.93	7.35	1.43
<i>LACMEET</i> (number of meetings)	0.03	0.08	2.48**	0.02	0.01	1.22
<i>DUAL</i> (%)	39.05	37.06	3.55***	37.06	37.71	-1.00
<i>LCEOTEN</i> (number of years)	0.72	0.64	5.69***	0.69	0.69	0.17
<i>WCEO</i> (%)	4.96	4.37	5.58***	4.54	4.71	-1.36
<i>FAM_OWN</i> (%)	22.74	26.32	-2.79***	26.17	24.85	0.84
<i>INST_OWN</i> (%)	32.26	23.79	5.87***	25.48	27.47	-1.18
<i>WDEBT</i> (%)	22.43	24.23	-2.62***	22.86	23.60	-0.87
<i>WRD</i> (%)	2.64	2.36	1.17	2.53	2.55	-0.05
<i>CROSS</i> (%)	25.85	25.70	0.07	25.41	27.22	-0.68
<i>LNASSETS</i> (billions of euros)	21.66	19.07	1.49	18.01	20.15	-1.07

This table reports the mean difference between firm with higher than median proportion of female director and firm year with lower than median proportion of female directors before and after matching for proportion of female directors and control variables for a sample of French firms listed on SBF 120 index (1610 firm-year observations for 97 French firms for the period between 2002 and 2019). Propensity score matching of Rosenbaum and Rubin (1983) yields a matched sample consisting of 1102 cases: 551 treatment cases (firm with high proportion of female director) and 551 comparison cases (firm with low proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

<sup>a</sup> t-tests are based on natural logarithm-transformed values.

## Multivariate analysis

### *Female directorship and firm performance*

To begin examining the link between our dependent variables (firm performance) and our variables of interest (female directorship), we use the model given in Equation 1. We use *WROA* to capture the accounting performance and Tobin's Q (*WQTOB*) to capture the market performance of French listed firms. Female directorship is measured by the proportion of female directors (*WBOARD*), the number of female directors (*NB\_WBOARD*), the Shannon index of gender diversity (*SHANNON*), and the Blau index of gender diversity (*BLAU*). Control variables included in our regression models are grouped into three categories. The first category is controlled for attributes of corporate boards (and their audit committees): size, independence, and number of meetings. The second category is controlled for effects of corporate leadership such as CEO/Chairperson duality, the presence of a female CEO, and CEO tenure. Lastly, ownership structure is controlled for using family ownership and institutional ownership variables. We also use control variables to capture firm riskiness, firm growth, and firm size. Moreover, industry and year dummies are also included to control for effects caused by variations in time and industry.

To counter endogeneity concerns, we run the system GMM as our primary estimation technique on PSM matched sample. For the purpose of completeness, tables 6 and 8 also summarize the results of the OLS and fixed effect estimations using the proportion of female directors and our measures of accounting and market-based firm performance. In addition to the regression estimations of OLS and Fixed effect models, the regression estimations of the system GMM model also comprise the

lagged value of our dependent variables. We examine the validity of the system GMM estimates by testing autocorrelations of endogenous (our measures of boardroom gender diversity) and dependent variables (our measures of firm performance). We test the dynamic specifications of these variables by using the Arellano and Bond (1991) autocorrelation test. The reported results reject the null hypothesis of no first-order serial correlation, though the null hypothesis of no second-order serial correlation is not ruled out. Therefore, our rationale for selecting the system GMM as our primary estimation technique is supported by these results, as this technique performs better in the presence of first-order serially-correlated processes (Roodman, 2009b). While generating the system GMM estimations, proliferation of instruments is another key issue that should be carefully considered. In system GMM models, each explanatory variable provides instruments associated with lagged and difference values. These instruments become weak as the number of explanatory variables increases (Roodman 2009b). Therefore, two standard specifications are carried out to examine the identification of the system GMM model. The Sargan test of over-identification rejects the null hypothesis of an over-identified model. The Hansen test of exogeneity of the instruments fails to reject the null hypothesis of valid (exogenous) instruments.

### *Test of H1*

We begin our investigation by testing the link between female directorship and *WROA* by using a propensity score matched sample and the model given in Equation 1 (see Tables 6 and 7). As proposed in the first hypothesis, we anticipate female directorship to be positively linked with firm performance. In Table 6, we capture female directorship using the proportion of female board members and estimate our results using the OLS, fixed-effect, and system GMM regression models, respectively. Our regression estimates of the OLS (Model 1) and fixed-effect (Model 2) models are

statistically insignificant, suggesting no association between our variable of interest (*WBOARD*) and *WROA*. In contrast, the system GMM estimates suggest a positive and significant link between *WBOARD* and *WROA*. The regression estimates of the system GMM model on the basis of other measures of female directorship—namely the number of female directors (*NB\_WBOARD*), the Shannon index of gender diversity (*SHANNON*), and the Blau index of gender diversity (*BLAU*)—are presented in Table 7. These results indicate a positive and significant association between our measures of female directorship and *WROA*. Therefore, the results of the system GMM models are in accordance with H1 and provide evidence to suggest that boardroom gender diversity enhances the accounting performance of French firms. We argue that the regression results of the OLS and fixed-effect models seem to be influenced by endogeneity issues, whereas the regression estimates of the system GMM approach are robust because this method appropriately counters various sources of endogeneity. Both the magnitude and significance of the regression estimates are enhanced when we apply the system GMM approach. These results are similar to the findings of Ahmadi et al. (2017), Bennouri et al. (2018), and Sabatier (2015) in the French context. Our results also ratify the findings of Post and Byron (2015) and Campbell and Mínguez-Vera (2008) that presence of female board members has a positive impact on the accounting performance of the firm.

Like our decision to investigate the effect of female directorship (*WBOARD*) on *WROA*, we also examine the link between female directorship (*WBOARD*) and Tobin's Q (i.e., *WQTOB*) by using a propensity score matched sample and the model given in Equation 1. In this regard, Table 8 presents the results of the OLS (Model 1), fixed-effect (Model 2), and system GMM regression (Model 3) models, respectively. Table 9 reports the results of the other three measures of female directorship (i.e.,

*SHANNON*, *BLAU*, and *NB\_WBOARD*). We find that female directorship (*WBOARD*) is negatively linked to market-based measure of firm performance (*WQTOB*), regardless of how we measure female directorship or which regression model is used (albeit not significantly for OLS estimates). It is noteworthy that the coefficients obtained in the fixed-effect estimation are smaller both in magnitude and significance compared to the system GMM estimates. These findings are consistent with Wintoki et al. (2012), who report that endogeneity issues can cause downward bias in regression estimates. Thus, our results provide evidence to suggest that female directorship negatively affects the market performance of French firms, as investors do not perceive praiseworthy outcomes of gender diversity on firm performance. These results are consistent with Bennouri et al. (2018), that the French market negatively perceives boardroom gender diversity. The author reports that female directorship does not affect accounting and market-based measures of firm performance in the same way, as accounting-based performance measure is associated with the advice-giving function of board and female input in decision-making helps firms to improve the effectiveness of board decisions, thus improving the accounting-based performance of a firm. In contrast, the market-based measure of performance represents the market's perception of the vigilance and monitoring ability of a firm. It appears that in France, the market does not respond positively to boardroom gender diversity. Another possible explanation is that boards may have more control over their accounting-based performance compared to their market-based performance. Our results also complement the empirical findings of Post and Byron (2015) regarding various effects of board gender diversity on different measures of firm performance, which suggest that a board's gender diversity positively affects *WROA* (accounting performance) while negatively affecting *WQTOB* (market performance).



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As expected, the coefficients of the board-related control variables board size (*LBSIZE*), independence (*BOARD\_IND*), and frequency of meetings (*LBMEET*) are positively correlated with firm performance. Our results are consistent with the findings of Bennouri et al. (2018), Liang et al. (2013), and Chau and Gray (2010). The coefficients of audit committee attributes (*AUDCOM\_SIZE*, *AC\_IND*, and *LACMEET*) are in line with our expectations. Although audit committee independence and the frequency of audit committee meetings are negative, they are not significant. Duality (*DUAL*) and CEO tenure (*LCEOTEN*) are negatively associated with Tobin's Q, indicating the market's unfavorable response to a person holding top positions for a longer period of time and/or occupying dual positions. Female CEOs (*WCEO*) are positively associated with both *WROA* and Tobin's Q. We find a positive link between family ownership and *WROA* consistent with the findings of Bennouri et al. (2018). The coefficient of institutional ownership is negative for both measures of firm performance, but not significant. R&D investments, debt ratio, and foreign listings do not show a significant effect on performance. Finally, consistent with the existing literature (Bennouri et al., 2018; Miller & Triana, 2009; Smith et al., 2005; Terjesen et al., 2016) firm size and performance are positively correlated.

Table 6: Regression of the ROA on the proportion of female directors

Variables	Predicted Sign	Model 1		Model 2		Model 3	
		OLS		Fixed effect		System GMM	
		Coef.	t-test	Coef.	t-test	Coef.	t-test
<i>Lag ROA</i>	?					0.804***	78.19
<i>WBOARD</i>		0.012	0.74	-0.021	-1.37	0.034***	2.67
<i>LBSIZE</i>	+	0.004	0.62	0.013*	1.76	0.003	1.28
<i>BOARD_IND</i>	+	0.028***	2.86	-0.012	-1.18	0.010***	2.79
<i>LBMEET</i>	+	0.007*	1.93	0.002	0.50	0.002*	1.74
<i>AUDITCOM_SIZE</i>	+	0.009	0.65	0.003**	2.17	-0.001	-0.38
<i>AC_IND</i>	+	-0.013*	-1.92	-0.010*	-1.53	-0.001	-0.89
<i>LACMEET</i>	+	0.001	0.30	-0.002	-0.06	-0.001	-0.91
<i>DUAL</i>	-	-0.016***	-3.32	0.010***	2.99	-0.001	-1.44
<i>LCEOTEN</i>	-	-0.003	-0.16	0.007	0.41	0.003	0.50
<i>WCEO</i>	+	-0.106***	-9.21	0.037***	2.60	0.020***	12.48
<i>FAM_OWN</i>	+	0.049***	6.66	0.011	1.01	0.009***	3.28
<i>INST_OWN</i>	-	-0.012*	-1.91	-0.007	-0.96	-0.003	-1.44
<i>WDEBT</i>	-	-0.001	-0.04	-0.011	-0.98	-0.008**	-2.33
<i>WRD</i>	+	-0.116***	-3.39	-0.316***	-4.57	-0.018	-1.31
<i>CROSS</i>	+	-0.004	-1.03	-0.022**	-2.08	-0.003	-0.29
<i>LNASSETS</i>	+	0.002**	2.39	-0.003*	-1.76	0.002	0.72
Intercept	?	-0.013	-0.65	0.128***	4.40	-0.014	-1.27
<i>Year</i>	?		Yes		Yes		Yes
<i>Industry</i>	?		Yes		Yes		Yes
Number of obs.			1102		1102		1067
R-squared (%)			26.51		9.31		
F (Prob > F)			7.91 ( $p = 0.000$ )		12.74 ( $p = 0.000$ )		31192.31 ( $p = 0.000$ )
Arellano–Bond test AR(1) ( $z, p$ -value):							-3.76 ( $p = 0.000$ )
Arellano–Bond test AR(2) ( $z, p$ -value):							1.34 ( $p = 0.181$ )
Sargan test (Chi-square, $p$ -value):							236.39 ( $p = 0.000$ )
Hansen test (Chi-square, $p$ -value):							49.94 ( $p = 0.941$ )

This table presents regression estimates of the OLS, the fixed effect, and the system GMM regressions of the ROA on proportion of female directors. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1102 cases: 551 treatment cases (firm with higher than median proportion of female director) and 551 comparison cases (firm with lower than median proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

Table 7: Regression of the ROA on the Shannon diversity index, the Blau diversity index, and the number of female directors

Variables	Predicted Sign	Model 1		Model 2		Model 3	
		SHANNON		BLAU		NB_WBOARD	
		Coef.	t-test	Coef.	t-test	Coef.	t-test
<i>Lag ROA</i>	?	0.793***	80.89	0.788***	84.96	0.804***	78.19
<i>WBOARD</i>	+	0.015**	2.50	0.018***	2.65	0.034***	2.67
<i>LBSIZE</i>	+	0.004**	2.18	0.002	1.11	0.003	1.28
<i>BOARD_IND</i>	+	0.008***	2.94	0.005	1.39	0.010***	2.79
<i>LBMEET</i>	+	0.002	1.27	0.002	1.31	0.002*	1.74
<i>AUDITCOM_SIZE</i>	+	-0.006	-1.53	-0.001	-0.77	-0.001	-0.38
<i>AC_IND</i>	+	-0.004*	-1.80	-0.001	-0.26	-0.001	-0.89
<i>LACMEET</i>	-	-0.002	-0.17	0.001	0.08	-0.001	-0.91
<i>DUAL</i>	-	-0.002	-1.60	-0.001*	-1.73	-0.001	-1.44
<i>LCEOTEN</i>	+	-0.001	-0.03	0.001	0.18	0.003	0.50
<i>WCEO</i>	+	-0.022***	-11.26	-0.021***	-10.92	0.020***	12.48
<i>FAM_OWN</i>	-	0.006**	1.98	0.007**	2.02	0.009***	3.28
<i>INST_OWN</i>	-	-0.006***	-2.76	-0.004*	-1.83	-0.003	-1.44
<i>WDEBT</i>	+	-0.005	-1.57	-0.006**	-2.09	-0.008**	-2.33
<i>WRD</i>	+	-0.021	-1.47	-0.020	-1.37	-0.018	-1.31
<i>CROSS</i>	+	-0.001	-0.80	-0.001	-0.87	-0.003	-0.29
<i>LNASSETS</i>	+	0.001	0.71	0.001	0.86	0.002	0.72
Intercept		-0.006	-0.81	-0.005	-0.55	-0.014	-1.27
<i>Year</i>			Yes		Yes		Yes
<i>Industry</i>			Yes		Yes		Yes
Number of obs.			1067		1102		1067
F (Prob > F)			31192.31 ( $p = 0.000$ )		10847.22 ( $p = 0.000$ )		27541.78 ( $p = 0.000$ )
Arellano–Bond test AR(1) ( $z, p$ -value):			-3.76 ( $p = 0.000$ )		-3.79 ( $p = 0.000$ )		-3.77 ( $p = 0.000$ )
Arellano–Bond test AR(2) ( $z, p$ -value):			1.34 ( $p = 0.181$ )		1.35 ( $p = 0.178$ )		1.33 ( $p = 0.184$ )
Sargan test (Chi-square, $p$ -value):			236.39 ( $p = 0.000$ )		240.86 ( $p = 0.000$ )		974.92 ( $p = 0.000$ )
Hansen test (Chi-square, $p$ -value):			49.94 ( $p = 0.941$ )		56.14 ( $p = 0.825$ )		62.12 ( $p = 0.708$ )

This table presents estimates of system GMM regressions of ROA on SHANNON, BLAU index and Number of female directors. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1102 cases: 551 treatment cases (firm with higher than median proportion of female director) and 551 comparison cases (firm with lower than median proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

Table 8: Regression of the TOBIN on the proportion of female directors

Variables	Predicted Sign	Model 1		Model 2		Model 3	
		OLS Coef.	t-test	Fixed effect Coef.	t-test	System GMM Coef.	t-test
<i>Lag WQTOB</i>	?					0.791***	106.44
<i>WBOARD</i>	+	-0.129	-0.37	-0.472*	-1.74	-0.732***	-4.35
<i>LBSIZE</i>	+	-0.282**	-2.15	0.109	0.80	0.026	0.67
<i>BOARD_IND</i>	+	-0.206	-0.96	-0.488***	-2.73	-0.098*	-1.83
<i>LBMEET</i>	+	0.159**	2.07	-0.005	-0.09	0.049***	2.88
<i>AUDITCOM_SIZE</i>	+	0.080**	2.51	0.031	1.20	0.005	0.65
<i>AC_IND</i>	+	-0.044	-0.29	-0.012	-0.11	-0.042	-1.58
<i>LACMEET</i>	+	0.029	0.36	-0.059	-0.94	-0.064**	-2.28
<i>DUAL</i>	-	-0.256***	-4.02	-0.005	-0.09	-0.076***	-5.33
<i>LCEOTEN</i>	-	0.066	1.45	0.039	1.14	-0.018	-0.19
<i>WCEO</i>	+	-0.084	-0.34	-0.837***	-3.27	0.154***	6.17
<i>FAM_OWN</i>	+	0.238	1.49	0.284	1.47	-0.111**	-2.42
<i>INST_OWN</i>	-	-0.377***	-2.85	-0.461***	-3.45	-0.081**	-1.99
<i>WDEBT</i>	-	0.225	0.97	1.632***	7.40	0.373***	5.88
<i>WRD</i>	+	-0.103	-0.14	0.889	0.72	-0.198	-0.90
<i>CROSS</i>	+	0.056	0.71	-0.053	-0.26	0.033	1.03
<i>LNASSETS</i>	+	-0.032	-1.60	-0.154	-4.73	-0.025***	-3.19
Intercept		1.551	3.62	2.362***	4.54	0.736***	4.06
<i>Year</i>			Yes		Yes		Yes
<i>Industry</i>			Yes		Yes		Yes
Number of obs.			1102		1102		1067
R-squared (%)			26.56		15.18		
F (Prob > F)			7.93 ( $p = 0.000$ )		5.11 ( $p = 0.000$ )		39907.35 ( $p = 0.000$ )
Arellano–Bond test AR(1) ( $z, p$ -value):							-2.18 ( $p = 0.000$ )
Arellano–Bond test AR(2) ( $z, p$ -value):							0.75 ( $p = 0.453$ )
Sargan test (Chi-square, $p$ -value):							973.87 ( $p = 0.000$ )
Hansen test (Chi-square, $p$ -value):							65.29 ( $p = 0.604$ )

This table presents regression estimates of the OLS, the fixed effect, and the system GMM regressions of the TOBIN on the proportion of female directors. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1102 cases: 551 treatment cases (firm with higher than median proportion of female director) and 551 comparison cases (firm with lower than median proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

Table 9: Regression of the TOBIN on the Shannon diversity index, the Blau diversity index, and the number of female directors

Variables	Predicted Sign	Model 1		Model 2		Model 3	
		SHANNON Coef.	t-test	BLAU Coef.	t-test	NB_WBOARD Coef.	t-test
<i>Lag WQTOB</i>	?	0.792***	74.99	0.793***	75.50	0.812***	79.86
<i>WBOARD</i>	+	-1.170***	-6.39	-1.461***	-9.05	-0.057***	-3.61
<i>LBSIZE</i>	+	0.019	0.26	0.099	0.16	0.074	1.16
<i>BOARD_IND</i>	+	-0.178**	-2.30	-0.148**	-2.27	-0.089	-1.15
<i>LBMEET</i>	+	0.041	1.56	0.037	1.33	0.041*	1.66
<i>AUDITCOM_SIZE</i>	+	0.005	0.37	-0.008	-0.65	0.010	1.03
<i>AC_IND</i>	+	-0.056	-1.41	-0.04	-1.14	-0.025	-0.67
<i>LACMEET</i>	+	-0.106***	-3.48	-0.085***	-2.66	-0.046	-1.04
<i>DUAL</i>	-	-0.077***	-2.78	-0.075***	-3.11	-0.053**	-2.54
<i>LCEOTEN</i>	-	-0.016	-1.12	-0.008	-0.70	0.001	0.10
<i>WCEO</i>	+	-0.069	-1.50	-0.094***	-2.78	0.343	1.17
<i>FAM_OWN</i>	+	-0.178**	-2.25	-0.165**	-2.60	-0.129*	-1.88
<i>INST_OWN</i>	-	-0.115*	-1.77	-0.102*	-1.77	-0.097*	-1.70
<i>WDEBT</i>	-	0.468***	4.62	0.456***	5.30	0.296***	3.85
<i>WRD</i>	+	0.186	0.24	-0.497*	-1.77	-0.320	-0.44
<i>CROSS</i>	+	0.040	1.08	0.042	1.16	-0.005	-0.12
<i>LNASSETS</i>	+	-0.012	-1.03	-0.014	-1.24	-0.009	-0.80
Intercept		1.264***	5.29	1.225***	5.98	0.025	0.11
<i>Year</i>			Yes		Yes		Yes
<i>Industry</i>			Yes		Yes		Yes
Number of obs.			1067		1067		1067
F (Prob > F)			129066.15 ( $p = 0.000$ )		225894.28 ( $p = 0.000$ )		7218.01 ( $p = 0.000$ )
Arellano–Bond test AR(1) ( $z, p$ -value):			-2.18 ( $p = 0.000$ )		-2.19 ( $p = 0.000$ )		-2.19 ( $p = 0.029$ )
Arellano–Bond test AR(2) ( $z, p$ -value):			0.71 ( $p = 0.480$ )		0.73 ( $p = 0.178$ )		0.75 ( $p = 0.451$ )
Sargan test (Chi-square, $p$ -value):			961.29 ( $p = 0.000$ )		963.72 ( $p = 0.000$ )		959.91 ( $p = 0.000$ )
Hansen test (Chi-square, $p$ -value):			68.34 ( $p = 0.500$ )		63.88 ( $p = 0.652$ )		62.23 ( $p = 0.705$ )

This table presents the system GMM regressions of the TOBIN on the Shannon diversity index, the Blau diversity index, and the number of female directors. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1102 cases: 551 treatment cases (firm with higher than median proportion of female director) and 551 comparison cases (firm with lower than median proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

*Test of H2*

In the next stage of our investigation, we test our second hypothesis by examining the effect of board gender quota legislation on the link between female directorship and firm performance. In this regard, H2 predicts that the relationship between board gender diversity and firm performance is enhanced by the enactment of the Cope-Zimmerman law. We test H2 by using the propensity score matched sample and the model given in Equation (2). For each measure of firm performance, we evaluate the marginal effect of female directorship on firm performance in the post-quota period by carrying out a joint test of coefficients using the difference-in-differences approach.

Tables 10 and 11, respectively, report the results for *WROA* and *WQTOB*. The results of the system GMM estimations presented in Table 10 (Model 1) show that the proportion of female board members (*WBOARD*) as well as the mandatory board gender quota (*QUOTA*), imposed by the enactment of the Cope-Zimmerman law, positively and significantly influence *WROA*. In comparison, the regression estimates presented in Table 11 (Model 1) show that the proportion of female board members (*WBOARD*) is negatively associated with *WQTOB*, whereas the enactment of the Cope-Zimmerman law (*QUOTA*) positively influences *WQTOB*. Going further, we specifically focus on the post-quota period (2011-2019) to examine the marginal effects of board gender quota legislation on the link between female directorship (*WBOARD*) and both measures of firm performance. Here, we focus on the joint test of coefficients on *WBOARD* and its interaction with board gender quota legislation ( $WBOARD \times QUOTA$ ) using the difference-in-differences procedure. The regression estimates of Model 2 in Tables 10 and 11 show that the joint coefficient on *WBOARD* and  $WBOARD \times QUOTA$  is positive and statistically significant for *ROA* as well as for

*WQTOB*. With regard to the accounting based-measure of firm performance (*WROA*), the regression estimates are in accordance with our expectation and suggest that the link between firm performance and female directorship is strengthened in the post-quota period, as the magnitude of regression estimates increased during this period. Surprisingly, the negative coefficient on *WQTOB* became positive in the post-quota period. In the framework of compulsory boardroom reforms, this positive change suggests that the negative perception of board gender diversity by market participants has become positive in the post-reform period. Overall, our findings contradict the results of Labelle et al. (2015), who report a negative effect of compulsory board gender diversity on firm performance using a sample of 17 countries over the period 2009 and 2011. In the French setting, the mandatory Cope-Zimmerman law appears to have positively influenced both accounting and market-based measures of firm performance following the enactment of its compulsory regulation.

These findings also contradict the empirical evidence of Ahern and Dittmar (2012), which found that the market responded negatively to the enactment of mandatory board gender diversity reform in Norway. Our findings suggest that female directorship being enhanced by a mandatory gender quota law is positively received by the French market. A striking result derived from our findings is that the increased proportion of female directors by virtue of the mandatory gender quota legislation has altered the negative perception of external shareholders into positive. In line with the findings of Reguera-Alvarado et al. (2017) regarding board gender quota regulation in Spain, we also document that the increased proportion of female directors on boards in compliance with mandatory gender quota law has increased the financial performance of firms. Consequently, based on the results of this study, it is concluded that mandatory board gender quota has increased the proportion of female directors on

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boards in a way that has statistically positive and significant results for both the economic and financial performance of firms. These findings shed light on the economic consequences of the Cope-Zimmerman law. These findings also provide justification of the business case argument for corporate board gender quotas that the incorporation of females on boards improves economic performance of businesses in significant ways.



Table 10: Regression of the ROA on the proportion of female directors and the quota law

Variables	Predicted Sign	Model 1		Model 2	
		QUOTA		<i>WBOARD</i> × <i>QUOTA</i>	
		Coef.	t-test	Coef.	t-test
<i>Lag ROA</i>	?	0.802***	109.71	0.772***	101.51
<i>WBOARD</i>	+	0.017***	4.05	0.022***	3.92
<i>QUOTA</i>	+	-0.003***	-3.19	-0.018***	-11.35
<i>WBOARD</i> × <i>QUOTA</i>	+			0.042***	6.24
<i>LBSIZE</i>	+	0.001	0.18	0.002	1.21
<i>BOARD_IND</i>	+	0.004*	1.67	0.007***	2.64
<i>LBMEET</i>	+	0.002**	2.36	0.003***	3.42
<i>AUDITCOM_SIZE</i>	+	-0.001*	-1.91	0.001	0.06
<i>AC_IND</i>	+	-0.003*	-1.74	-0.004**	-2.11
<i>LACMEET</i>	+	0.001	0.64	0.001	0.76
<i>DUAL</i>	-	-0.001**	-2.04	-0.003***	-3.44
<i>LCEOTEN</i>	-	0.001	1.05	-0.001	-0.75
<i>WCEO</i>	+	-0.021***	-15.55	-0.024***	-16.80
<i>FAM_OWN</i>	+	0.010***	3.78	0.013***	5.29
<i>INST_OWN</i>	-	-0.005**	-2.59	-0.005**	-2.33
<i>WDEBT</i>	-	-0.011***	-3.82	-0.011***	-4.26
<i>WRD</i>	+	-0.038***	-3.93	-0.043***	-5.17
<i>CROSS</i>	+	-0.001	-0.69	-0.001	-1.20
<i>LNASSETS</i>	+	0.001**	2.34	0.001*	1.84
Intercept		0.004	0.99	-0.001	-0.08
<i>Industry</i>		Yes		Yes	
Number of obs.		1067		1067	
F (Prob > F)		43385.41 ( $p = 0.000$ )		31423.58 ( $p = 0.000$ )	
Arellano–Bond test AR(1) ( $z, p$ -value):		-4.10 ( $p = 0.000$ )		-4.10 ( $p = 0.000$ )	
Arellano–Bond test AR(2) ( $z, p$ -value):		1.56 ( $p = 0.120$ )		1.50 ( $p = 0.133$ )	
Sargan test (Chi-square, $p$ -value):		977.33 ( $p = 0.000$ )		162.92 ( $p = 0.000$ )	
Hansen test (Chi-square, $p$ -value):		77.93 ( $p = 0.216$ )		78.90 ( $p = 0.133$ )	
Difference-in-difference test : <i>WBOARD</i> + <i>WBOARD</i> × <i>QUOTA</i>				0.063***	12.99

This table presents the system GMM regressions of the ROA on the proportion of female directors and the quota law. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1102 cases: 551 treatment cases (firm with higher than median proportion of female director) and 551 comparison cases (firm with lower than median proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

Table 11: Regression of the TOBIN on the proportion of female directors and the quota law

Variables	Predicted sign	Model 1		Model 2	
		QOUTA		<i>WBOARD</i> × <i>QUOTA</i>	
		Coef.	t-test	Coef.	t-test
<i>Lag WQTOB</i>	?	0.786***	132.9	0.757***	208.17
<i>WBOARD</i>	+	-0.309***	-6.50	0.117**	2.14
<i>QUOTA</i>	+	0.123***	11.32	-0.093***	-4.18
<i>WBOARD</i> × <i>QUOTA</i>	+			0.371***	3.93
<i>LBSIZE</i>	+	-0.038	-1.42	-0.009	-0.43
<i>BOARD_IND</i>	+	-0.062**	-1.97	-0.004	-0.13
<i>LBMEET</i>	+	0.056***	5.18	0.063***	8.64
<i>AUDITCOM_SIZE</i>	+	0.010	1.47	0.033***	5.87
<i>AC_IND</i>	+	-0.029	-1.31	-0.022	-1.15
<i>LACMEET</i>	+	-0.008	-0.70	-0.005	-0.43
<i>DUAL</i>	-	-0.073***	-7.21	-0.075***	-8.59
<i>LCEOTEN</i>	-	0.017**	2.44	0.023***	3.10
<i>WCEO</i>	+	-0.169***	-10.31	-0.14***	-5.96
<i>FAM_OWN</i>	+	-0.028	-0.95	-0.008	-0.29
<i>INST_OWN</i>	-	-0.066**	-2.29	-0.061**	-2.05
<i>WDEBT</i>	-	0.328***	7.83	0.276***	9.30
<i>WRD</i>	+	-0.392**	-2.36	-0.251**	-2.21
<i>CROSS</i>	+	-0.006	-0.43	0.008	0.68
<i>LNASSETS</i>	+	-0.012*	-1.74	-0.022***	-3.66
Intercept		0.365***	4.76	0.224***	3.24
<i>Industry</i>		Yes		Yes	
Number of obs.		1067		1067	
F (Prob > F)		69174.90 ( $p = 0.000$ )		892643.97 ( $p = 0.000$ )	
Arellano–Bond test AR(1) ( $z, p$ -value):		-2.24 ( $p = 0.025$ )		-2.23 ( $p = 0.026$ )	
Arellano–Bond test AR(2) ( $z, p$ -value):		0.75 ( $p = 0.451$ )		0.78 ( $p = 0.438$ )	
Sargan test (Chi-square, $p$ -value):		987.68 ( $p = 0.000$ )		339.70 ( $p = 0.000$ )	
Hansen test (Chi-square, $p$ -value):		78.15 ( $p = 0.211$ )		79.61 ( $p = 0.121$ )	
Difference-in-difference test : <i>WBOARD</i> + <i>WBOARD</i> × <i>QUOTA</i>				0.487***	7.68

This table presents the system GMM regressions of the TOBIN on the proportion of female directors and the quota law. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1102 cases: 551 treatment cases (firm with higher than median proportion of female director) and 551 comparison cases (firm with lower than median proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

*Position of female directors on boards and quota law*

So far, we have discussed our findings that overall boardroom gender diversity is positively linked with the accounting performance of French firms, whereas it is negatively linked with their market performance. Additionally, we find that compulsory regulation in the form of a boardroom gender quota law has positively contributed towards the accounting and market performance of French firms. Going further, we aim to examine whether the integration of female board members in various positions on corporate boards, as demonstrated in our trend analysis, also translates into better economic and market performance of French firms. Boards of directors execute their authority through the positions assigned to them (Campbell & Mínguez-Vera, 2007). We follow Lie et al. (2017) and Nekhili et al. (2020) in identifying female directors' positions using three measures: the proportion of female inside directors on boards only (*WBOARDINSIDE*), female independent directors (*WBOARDIND*), and female audit committee members (*WBOARDAUDC*). We use the propensity score matched sample and estimate model given in Equation 3 with the system GMM regression method. The rationale for utilizing the propensity score matching technique is to eliminate endogeneity concerns arising from the observable attributes of French firms. With respect to the median value, we matched firm-years with higher and lower proportions of female directors in each position. A dummy variable took on a value of 1 to represent a high proportion of female directors in each position relative to the median value. We separately estimate the effect of each position assigned to female directors on accounting and market-based measures of firm performance. Tables 12–20 report the results related to propensity score matching, the effect of positions assigned to female directors, and their impact on firm performance.

*Test of H3a*

In this stage of our investigation, we begin testing our third hypothesis by focusing on the link between inside/executive female directors and firm performance. In this regard, H3a predicts that the appointment of female inside directors (on board only) has a negative relationship with firm performance, and this relationship is more pronounced in the post-quota period. Before regression analysis, we use the propensity score matching to examine the structural differences between firm-years with higher and lower proportions of female inside directors based on the median value (6.25) in Table 12. We report a number of differences between the observable characteristics of both subsamples. In particular, we observe that accounting-based firm performance is lower (albeit not significantly) for the subsample of firms-years with higher than median proportion of female inside directors. Nonetheless, we use matching procedure as discussed in Table 5. Using similar criteria, the PSM technique mitigates all the observable differences between both subsamples. It is evident from the results that after matching the differences between the treatment and control group become less significant as compared to differences before matching.

The results of system GMM regression of female inside directors (*WBOARDINSIDE*) on *WROA* and Tobin's Q are presented in Table 13 and Table 14, respectively. Results of Model 1 in Table 13 show that the coefficient on *WBOARDINSIDE* is negative and significant ( $\beta_2 = -0.058$ ,  $t = -3.93$ ). These results indicate that female inside directors negatively affect *WROA* of French firms. These results stand in sharp contrast to those reported by previous studies that female directors enhance accounting-based firm performance. In Model 2, we introduce the variable *QUOTA* and re-estimate our regression model. Results of Model 2 in Table 13 show that the coefficient on *QUOTA* is positive and significant ( $\beta_3 = 0.002$ ,  $t = 3.81$ ),

whereas, the coefficient on *WBOARDINSIDE* remains unchanged. To test the marginal effect of *WBOARDINSIDE* on *WROA* in the post-quota period, we use interaction between *WBOARDINSIDE* and *QUOTA* in Model 3. Here, we focus on the joint test of coefficients on *WBOARDINSIDE* and its interaction with board gender quota legislation ( $WBOARDINSIDE \times QUOTA$ ) using the difference-in-differences procedure. Results of Model 3 in Table 13 show that the effect of female inside directors on *WROA* remains negative and highly significant ( $\beta_2 + \beta_4 = -0.046$ ,  $t = -5.14$ ).

Regarding the effect of female inside directors (*WBOARDINSIDE*) on market-based performance (*WQTOB*) of French listed firms, the results of Model 1 in Table 14 show that *WBOARDINSIDE* has a positive effect on *WQTOB* ( $\beta_2 = 0.645$ ,  $t = 2.14$ ). In Model 2, we find that enactment of gender quota law positively influenced the market-based measure of firm performance ( $\beta_3 = 0.116$ ,  $t = 3.72$ ). In addition, we find this relationship remains unchanged when we include variable *QUOTA* in our regression Model 2. More importantly, the results of joint test of coefficients  $WBOARDINSIDE + (WBOARDINSIDE \times QUOTA)$  as reported in Model 3 show that the marginal effect of female inside directors on *WQTOB* has increased significantly ( $\beta_2 + \beta_4 = 1.845$ ,  $t = 13.64$ ).

Overall, we find that firms' accounting performance does not increase with the appointment of female directors on board only; rather in fact female inside directors negatively affect the profitability of their firms. However, the market responds positively to the appointment of female directors even if they sit on board only. Overall, these results are according to our expectation and confirm H3a.

**Table 12: Mean difference test between firm-years with high proportion of female inside directors and firm-years with low proportion of female inside directors for entire and matched samples.**

Variable	Entire Sample			Matched Sample		
	Firm-years with high proportion of female inside directors( $n = 822$ )	Firm-years with low proportion of female inside directors ( $n = 788$ )	t-test/Chi <sup>2</sup> <sup>a</sup>	Treatment group ( $n = 605$ )	Control group ( $n = 605$ )	t-test/Chi <sup>2</sup> <sup>a</sup>
<i>WROA</i>	4.59	4.84	-1.01	4.54	4.65	-0.39
<i>WQTOB</i>	1.19	1.18	0.23	1.16	1.15	0.21
<i>LBSIZE</i> (number of directors)	12.54	12.15	2.30**	12.42	12.59	-0.86
<i>BOARD_IND</i> %	46.34	51.42	-4.89***	48.98	48.12	0.72
<i>LBMEET</i> (number of meetings)	7.07	7.19	-0.76	7.22	7.13	0.53
<i>AUDITCOM_SIZE</i> (number of members)	3.89	3.72	2.96***	3.78	3.81	-0.51
<i>AC_IND</i> %	66.37	69.91	-2.62***	68.07	67.08	0.64
<i>LACMEET</i> (number of meetings)	4.69	4.66	0.37	4.73	4.81	-0.65
<i>DUAL</i> (%)	59.98	54.32	2.30**	58.51	59.17	-0.23
<i>LCEOTEN</i> (number of years)	8.82	7.38	3.97***	7.96	7.45	1.31
<i>WCEO</i> (%)	2.20	0.89	2.11**	0.66	0.12	-0.91
<i>FAM_OWN</i> (%)	26.31	22.57	2.91***	23.01	25.14	-1.44
<i>INST_OWN</i> (%)	28.02	28.28	-0.18	29.75	26.98	1.57
<i>WDEBT</i> (%)	22.49	24.17	-2.46**	24.57	23.78	1.00
<i>WRD</i> (%)	1.89	3.15	-5.36***	02.18	02.33	-0.55
<i>CROSS</i> (%)	28.95	22.46	2.98***	26.78	25.29	0.59
<i>LNASSETS</i> (billions of euros)	22.98	17.73	3.02***	22.48	18.75	1.59

This table reports the mean difference between firm with high proportion of female inside director and firm year with low proportion of female inside directors before and after matching for proportion of female directors and control variables for a sample of French firms listed on SBF 120 index (1610 firm-year observations for 97 French firms for the period between 2002 and 2019). Propensity score matching of Rosenbaum and Rubin (1983) yields a matched sample consisting of 1210 cases: 605 treatment cases (firm with higher than median proportion of female inside director) and 605 comparison cases (firm with lower than median proportion of female inside director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

Table 13: Regression of ROA on the proportion of female inside directors and the quota law

Variable	Expected Sign <sup>a</sup>	Model 1		Model 2		Model 3	
		Coef.	t-test	Coef.	t-test	Coef.	t-test
<i>Lag ROA</i>	?	0.782***	67.66	0.782***	109.10	0.781***	104.13
<i>WBOARDINSIDE</i>	–	–0.058***	–3.93	–0.029***	–4.44	–0.017**	–2.42
<i>QUOTA</i>	+			0.002***	3.81	0.005***	4.38
<i>WBOARDINSIDE</i> × <i>QUOTA</i>						–0.03***	–3.88
<i>LBSIZE</i>	+	–0.001	–0.04	–0.002	–1.02	–0.002	–0.83
<i>BOARD_IND</i>	+	–0.002	–0.55	–0.000	–0.18	–0.001	–0.38
<i>LBMEET</i>	+	0.001	1.01	0.002**	2.55	0.002**	1.96
<i>AUDITCOM_SIZE</i>	+	0.003	0.62	0.000	0.74	0.000	1.08
<i>AC_IND</i>	+	–0.001	–0.49	–0.000	–0.29	0.001	0.34
<i>LACMEET</i>	+	–0.008	–0.71	0.000	0.28	0.000	0.23
<i>DUAL</i>	–	0.000	0.05	–0.000	–1.03	–0.000	–0.56
<i>LCEOTEN</i>	–	–0.007	–1.11	0.000	0.07	–0.000	–0.11
<i>WCEO</i>	+	–0.038***	–11.53	–0.043***	–20.59	–0.044***	–21.85
<i>FAM_OWN</i>	+	–0.001	–0.12	0.005**	2.14	0.005*	1.94
<i>INST_OWN</i>	–	–0.007***	–3.15	–0.005***	–3.85	–0.005***	–3.96
<i>WDEBT</i>	–	–0.010**	–2.56	–0.020***	–8.42	–0.019***	–8.13
<i>WRD</i>	+	–0.059***	–2.96	–0.050***	–3.96	–0.054***	–4.09
<i>CROSS</i>	+	–0.000	–0.31	0.000	0.29	0.000	0.34
<i>LNASSETS</i>	+	0.000	0.48	0.001	1.63	0.000	1.10
Intercept	?	0.027**	2.62	0.018***	2.91	0.0175**	2.62
Industry	?		Yes		Yes		Yes
Number of observations			1161		1161		1161
Fisher (Prob > F, <i>p</i> -value):			5341.38 ( <i>p</i> = 0.000)		53528.04 ( <i>p</i> = 0.000)		43598.40 ( <i>p</i> = 0.000)
Arellano–Bond test AR(1) ( <i>z</i> , <i>p</i> -value):			–4.08 ( <i>p</i> = 0.000)		–4.10 ( <i>p</i> = 0.000)		–4.10 ( <i>p</i> = 0.000)
Arellano–Bond test AR(2) ( <i>z</i> , <i>p</i> -value):			0.35 ( <i>p</i> = 0.724)		0.22 ( <i>p</i> = 0.830)		0.25 ( <i>p</i> = 0.805)
Sargan test (Chi-square, <i>p</i> -value):			209.99 ( <i>p</i> = 0.000)		996.92 ( <i>p</i> = 0.000)		995.95 ( <i>p</i> = 0.000)
Hansen test (Chi-square, <i>p</i> -value):			58.33 ( <i>p</i> = 0.766)		80.97 ( <i>p</i> = 0.154)		78.29 ( <i>p</i> = 0.185)
Difference-in-difference test : <i>WBOARDINSIDE</i> + <i>WBOARDINSIDE</i> × <i>QUOTA</i>						–0.046***	–5.14

This table provides results of the system GMM regressions of ROA on the proportion of female inside directors and quota law on a matched sample. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1210 cases: 605 treatment cases (firm with higher than median proportion of female director) and 605 comparison cases (firm with lower than median proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

Table 14: Regression of TOBIN on the proportion of female inside directors and the quota law

Variable	Expected Sign <sup>a</sup>	Model 1		Model 2		Model 3	
		Coef.	t-test	Coef.	t-test	Coef.	t-test
<i>Lag WQTOB</i>	?	0.826***	101.30	0.809***	184.19	0.802***	168.51
<i>WBOARDINSIDE</i>	–	0.645**	2.14	1.281***	13.05	0.444***	3.84
<i>QUOTA</i>	+			0.116***	3.72	1.402***	12.67
<i>WBOARDINSIDE</i> × <i>QUOTA</i>						0.096***	2.87
<i>LBSIZE</i>	+	0.088***	2.81	–0.073***	–11.21	–0.168***	–13.75
<i>BOARD_IND</i>	+	0.061	0.95	0.124***	2.68	0.137***	2.85
<i>LBMEET</i>	+	0.059***	3.44	0.081***	6.53	0.082***	5.69
<i>AUDITCOM_SIZE</i>	+	0.027**	2.53	0.041***	4.43	0.047***	4.40
<i>AC_IND</i>	+	0.002	0.06	–0.013	–0.51	–0.026	–0.93
<i>LACMEET</i>	+	–0.041**	–2.37	–0.032**	–2.52	–0.026*	–1.88
<i>DUAL</i>	–	–0.054***	–3.77	–0.045***	–3.29	–0.048***	–3.13
<i>LCEOTEN</i>	–	0.001	0.09	0.017	2.21	0.019**	2.13
<i>WCEO</i>	+	–0.278***	–7.98	–0.381***	–10.01	–0.319***	–12.09
<i>FAM_OWN</i>	+	0.09	1.62	0.137***	3.53	0.161***	3.98
<i>INST_OWN</i>	–	–0.01	–0.25	–0.02	–0.65	–0.009	–0.05
<i>WDEBT</i>	–	0.249***	5.13	0.225***	7.41	0.231***	7.10
<i>WRD</i>	+	0.422	1.39	0.697***	3.13	0.521**	2.25
<i>CROSS</i>	+	0.001	0.06	–0.022	–1.22	–0.015	–0.74
<i>LNASSETS</i>	+	–0.013*	–1.83	–0.022***	–3.58	–0.021***	–3.19
Intercept	?	–0.138	–0.81	–0.351***	–2.87	–0.283**	–2.14
Industry	?		Yes		Yes		Yes
Number of observations			1161		1161		1161
Fisher (Prob > F, <i>p</i> -value):		259161.03 ( <i>p</i> = 0.000)		180039.29 ( <i>p</i> = 0.000)		55235.52 ( <i>p</i> = 0.000)	
Arellano–Bond test AR(1) ( <i>z</i> , <i>p</i> -value):		–3.10 ( <i>p</i> = 0.000)		–3.20 ( <i>p</i> = 0.000)		–3.19 ( <i>p</i> = 0.000)	
Arellano–Bond test AR(2) ( <i>z</i> , <i>p</i> -value):		0.58 ( <i>p</i> = 0.564)		0.46 ( <i>p</i> = 0.644)		–0.46 ( <i>p</i> = 0.646)	
Sargan test (Chi-square, <i>p</i> -value):		882.07 ( <i>p</i> = 0.000)		887.26 ( <i>p</i> = 0.000)		890.08 ( <i>p</i> = 0.000)	
Hansen test (Chi-square, <i>p</i> -value):		70.60 ( <i>p</i> = 0.424)		77.02 ( <i>p</i> = 0.238)		76.28 ( <i>p</i> = 0.230)	
Difference-in-difference test : <i>WBOARDINSIDE</i> + <i>WBOARDINSIDE</i> × <i>QUOTA</i>						1.845***	13.64

This table provides results of the system GMM regressions of Tobin's Q on the proportion of female inside directors and quota law on a matched sample. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1210 cases: 605 treatment cases (firm with higher than median proportion of female director) and 605 comparison cases (firm with lower than median proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.



*Test of H3b*

To examine the link between female independent directors (*WBOARDIND*) and firm performance, we match firm-years with high proportion of *WBOARDIND* and firm-years with low proportion of *WBOARDIND* based on median value (8.33) in Table 15. Contrary to the results reported in Table 12 concerning female inside directors and firm performance, we find that accounting-based performance of French firms is significantly higher for firm-years with higher than median proportion of female independent directors. However, we do not find any substantial difference between market-based performance of both subsample. In addition, we also note various differences between the observable characteristics of both subsamples. It is clear from the results reported in Table 15 that all observable differences between the subsamples disappear after implementing matching procedure.

Table 16 present the results of system GMM regression of female independent directors (*WBOARDIND*) on *WROA* using the PSM matched sample. In accordance with H3b, we expect that there is a positive relationship between the appointment of female independent directors and firm performance, and this relationship is more pronounced in the post-quota period. Results of Model 1 in Table 16 show that the coefficient on *WBOARDIND* is positive and significant ( $\beta_2 = 0.058$ ,  $t = 4.52$ ), suggesting that female independent directors positively affect accounting performance of French listed firms. We then re-estimate our regression model after including the variable *QUOTA*. Results of Model 2 in Table 16 show that the coefficient on *QUOTA* is negative and significant ( $\beta_3 = -0.014$ ,  $t = -18.40$ ), whereas, the coefficient on *WBOARDIND* remains positive and significant. More importantly, we examine the marginal effect of *WBOARDIND* on *WROA* in the post-quota period by using interaction between *WBOARDIND* and *QUOTA* in Model 3. Here, we again use

difference-in-differences procedure to focus on the joint test of coefficients on *WBOARDIND* and its interaction with board gender quota legislation (*WBOARDIND* × *QUOTA*). Our findings reported in Model 3 demonstrate that female independent directors positively and significantly influence *WROA* of French firms. Noticeably, the coefficient size as well as the level of significance substantially increased in the post-quota period ( $\beta_2 + \beta_4 = 0.097$ ,  $t = 12.59$ ).

Table 17 present the results of system GMM regression of female independent directors (*WBOARDIND*) on Tobin's Q using the PSM matched sample. In Model 1, we find that *WBOARDIND* negatively and significantly affect market performance of French listed firms ( $\beta_2 = -0.173$ ,  $t = -0.93$ ). Going further, results of Model 2 indicate that the enactment of gender quotas (*QUOTA*) has a positive effect on Tobin's Q ( $\beta_3 = 0.088$ ,  $t = 9.61$ ), whereas, the coefficient on *WBOARDIND* remains negative and significant. The marginal effect of *WBOARDIND* on Tobin's Q is shown in the Model 3. In the post-quota period, we find that female independent directors positively influence *WQTOB* (albeit insignificantly).

Overall, our regression estimates show that the appointment of female independent directors positively affects profitability of French firms. However, the market responds negatively to the appointment of female independent directors before the implementation of gender quota law. Interestingly, in the post-quota period the effect of independent directors is positive for both measures of firm performance. These results are according to our expectation and confirm H3b.

**Table 15: Mean difference test between firm-years with high proportion of female independent directors and firm-years with low proportion of female independent directors for entire and matched samples**

Variable	Entire Sample			Matched Sample		
	Firm-years with high proportion of female independent directors ( <i>n</i> = 834)	Firm-years with low proportion of female independent directors ( <i>n</i> = 776)	t-test/Chi <sup>2</sup> <sup>a</sup>	Treatment group ( <i>n</i> = 568)	Control group ( <i>n</i> = 568)	t-test/Chi <sup>2</sup> <sup>a</sup>
<i>WROA</i>	5.12	4.28	3.45***	5.38	4.16	4.06***
<i>WQTOB</i>	1.17	1.21	-0.85	1.19	1.19	0.03
<i>LBSIZE</i> (number of directors)	12.25	12.46	-1.25	12.39	12.35	0.24
<i>BOARD_IND</i> %	53.19	44.14	8.86***	47.33	48.26	-0.83
<i>LBMEET</i> (number of meetings)	7.42	6.82	3.92***	6.89	7.04	-0.68
<i>AUDITCOM_SIZE</i> (number of members)	3.85	3.76	1.55	3.77	3.75	0.30
<i>AC_IND</i> %	72.37	63.52	6.63***	68.57	67.54	0.68
<i>LACMEET</i> (number of meetings)	4.84	4.50	3.18***	4.52	4.67	-1.28
<i>DUAL</i> (%)	58.39	55.93	1.00	57.39	57.92	-0.18
<i>LCEOTEN</i> (number of years)	8.95	7.22	4.79***	8.54	7.76	1.75*
<i>WCEO</i> (%)	1.44	1.68	-0.38	1.59	2.11	-0.66
<i>FAM_OWN</i> (%)	21.89	27.26	-4.19***	27.57	25.66	1.23
<i>INST_OWN</i> (%)	32.33	23.65	6.01***	24.90	26.69	-1.10
<i>WDEBT</i> (%)	22.34	24.34	-2.92***	22.08	22.72	-0.79
<i>WRD</i> (%)	2.66	2.34	1.40	2.61	2.62	-0.04
<i>CROSS</i> (%)	21.10	30.79	-4.47***	25.88	25.53	0.14
<i>LNASSETS</i> (billions of euros)	18.88	22.04	-1.82*	16.04	23.46	-3.57**

This table reports the mean difference between firm with high proportion of female independent director and firm year with low proportion of female independent directors before and after matching for proportion of female directors and control variables for a sample of French firms listed on SBF 120 index (1610 firm-year observations for 97 French firms for the period between 2002 and 2019). Propensity score matching of Rosenbaum and Rubin (1983) yields a matched sample consisting of 1136 cases: 568 treatment cases (firm with higher than median proportion of female independent director) and 568 comparison cases (firm with lower than median proportion independent of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

Table 16: Regression of ROA on the proportion of female independent directors and the quota law

Variable	Expected Sign <sup>a</sup>	Model 1		Model 2		Model 3	
		Coef.	t-test	Coef.	t-test	Coef.	t-test
<i>Lag ROA</i>	?	0.795***	55.59	0.741***	127.22	0.747***	89.20
<i>WBOARDIND</i>	+	0.058***	4.52	0.075***	18.76	0.017**	2.45
<i>QUOTA</i>	+			-0.014***	-18.40	-0.021***	-11.86
<i>WBOARDIND</i> × <i>QUOTA</i>	+					0.081***	7.66
<i>LBSIZE</i>	+	0.001	0.62	0.001	0.05	0.000	0.37
<i>BOARD_IND</i>	+	0.005	1.15	0.006***	2.61	0.004*	1.87
<i>LBMEET</i>	+	0.001	0.77	0.000	0.17	0.001	0.59
<i>AUDITCOM_SIZE</i>	+	0.000	0.63	0.001	1.24	0.000	0.64
<i>AC_IND</i>	+	-0.001	-0.80	-0.007***	-4.72	-0.006***	-3.26
<i>LACMEET</i>	+	-0.001	-1.03	0.000	0.14	-0.000	-0.44
<i>DUAL</i>	-	-4.800	-0.00	-0.001	-0.91	-0.000	-0.23
<i>LCEOTEN</i>	-	-0.000	-0.32	0.000	1.01	0.000	0.20
<i>WCEO</i>	+	-0.015***	-6.42	-0.016***	-12.88	-0.012***	-8.76
<i>FAM_OWN</i>	+	0.076*	1.85	0.012***	5.57	0.013***	5.44
<i>INST_OWN</i>	-	-0.006**	-2.48	-0.008***	-4.45	-0.007***	-3.62
<i>WDEBT</i>	-	-0.019***	-4.09	-0.019***	-7.36	-0.018***	-6.51
<i>WRD</i>	+	-0.019	-1.11	-0.059***	-4.76	-0.054***	-4.15
<i>CROSS</i>	+	-0.000	-0.03	0.002**	2.19	0.003***	2.59
<i>LNASSETS</i>	+	0.000	0.49	0.001***	3.12	0.000***	2.64
Intercept	?	0.008	1.02	0.020*	1.94	0.012***	2.62
Industry	?		Yes		Yes		Yes
Number of observations			1099		1099		1099
Fisher (Prob > F, <i>p</i> -value):			5341.38 ( <i>p</i> = 0.000)		46214.50 ( <i>p</i> = 0.000)		24032.10 ( <i>p</i> = 0.000)
Arellano–Bond test AR(1) ( <i>z</i> , <i>p</i> -value):			-3.96 ( <i>p</i> = 0.000)		-4.18 ( <i>p</i> = 0.000)		-4.18 ( <i>p</i> = 0.000)
Arellano–Bond test AR(2) ( <i>z</i> , <i>p</i> -value):			0.70 ( <i>p</i> = 0.487)		0.71 ( <i>p</i> = 0.478)		0.67 ( <i>p</i> = 0.504)
Sargan test (Chi-square, <i>p</i> -value):			1013.52 ( <i>p</i> = 0.000)		1025.93 ( <i>p</i> = 0.000)		1019.43 ( <i>p</i> = 0.000)
Hansen test (Chi-square, <i>p</i> -value):			46.32 ( <i>p</i> = 0.984)		83.72 ( <i>p</i> = 0.109)		80.88 ( <i>p</i> = 0.136)
Difference-in-difference test : <i>WBOARDIND</i> + <i>WBOARDIND</i> × <i>QUOTA</i>						0.097***	12.59

This table provides results of the system GMM regressions of ROA on the proportion of female independent directors and quota law on a matched sample. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1136 cases: 568 treatment cases (firm with higher than median proportion of female director) and 568 comparison cases (firm with lower than median proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

Table 17: Regression of TOBIN on the proportion of female independent directors and the quota law

Variable	Expected Sign <sup>a</sup>	Model 1		Model 2		Model 3	
		Coef.	t-test	Coef.	t-test	Coef.	t-test
<i>Lag WQTOB</i>	?	0.782***	110.42	0.760***	146.71	0.759***	143.59
<i>WBOARDIND</i>	+	-0.173	-0.93	-0.288***	-5.02	-0.776***	-8.32
<i>QUOTA</i>	+			0.088***	9.61	0.008	0.54
<i>WBOARDIND × QUOTA</i>	+					0.801	7.19
<i>LBSIZE</i>	+	-0.018	-0.50	0.047	1.59	0.037	1.12
<i>BOARD_IND</i>	+	0.018	0.38	0.053	1.59	-0.005	-0.12
<i>LBMEET</i>	+	0.065***	4.03	0.081***	6.15	0.085***	6.12
<i>AUDITCOM_SIZE</i>	+	0.005	0.59	0.016**	2.15	0.018**	2.53
<i>AC_IND</i>	+	-0.023	-0.74	-0.021	-1.14	0.006	0.31
<i>LACMEET</i>	+	-0.055**	-2.16	0.018	1.28	0.022	1.44
<i>DUAL</i>	-	-0.084***	-5.59	-0.087***	-7.53	-0.083***	-7.00
<i>LCEOTEN</i>	-	-0.006	-0.76	0.001	0.14	-0.002	-0.22
<i>WCEO</i>	+	-0.287***	-7.60	-0.299***	-10.77	-0.256***	-8.49
<i>FAM_OWN</i>	+	0.112**	2.23	0.146***	4.09	0.141***	3.62
<i>INST_OWN</i>	-	-0.039	-1.06	-0.06**	-2.21	-0.057**	-1.98
<i>WDEBT</i>	-	0.131**	2.16	0.073*	1.87	0.055	1.26
<i>WRD</i>	+	-0.434**	-2.14	-0.707***	-4.34	-0.661***	-4.13
<i>CROSS</i>	+	0.014	0.59	-0.033**	-1.97	-0.04	-2.15
<i>LNASSETS</i>	+	-0.012	-1.32	-0.021***	-2.86	-0.021	-2.42
Intercept	?	0.069	0.57	0.161*	1.69	0.209**	1.98
Industry	?		Yes		Yes		Yes
Number of observations			1099		1099		1099
Fisher (Prob > F, <i>p</i> -value):			29465.03 ( <i>p</i> = 0.000)		27723.18 ( <i>p</i> = 0.000)		55235.52 ( <i>p</i> = 0.000)
Arellano–Bond test AR(1) ( <i>z</i> , <i>p</i> -value):			-2.52 ( <i>p</i> = 0.000)		-2.53 ( <i>p</i> = 0.011)		-3.19 ( <i>p</i> = 0.000)
Arellano–Bond test AR(2) ( <i>z</i> , <i>p</i> -value):			0.40 ( <i>p</i> = 0.688)		0.49 ( <i>p</i> = 0.625)		-0.46 ( <i>p</i> = 0.646)
Sargan test (Chi-square, <i>p</i> -value):			1004.91 ( <i>p</i> = 0.000)		1005.89 ( <i>p</i> = 0.000)		890.08 ( <i>p</i> = 0.000)
Hansen test (Chi-square, <i>p</i> -value):			59.37 ( <i>p</i> = 0.789)		76.82 ( <i>p</i> = 0.217)		76.28 ( <i>p</i> = 0.230)
Difference-in-difference test : <i>WBOARDIND</i> + <i>WBOARDIND × QUOTA</i>						0.025	0.35

This table provides results of the system GMM regressions of Tobin's Q on the proportion of female independent directors and quota law on a matched sample. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1136 cases: 568 treatment cases (firm with higher than median proportion of female director) and 568 comparison cases (firm with lower than median proportion of female director). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

*Test of H3c*

Finally, we examine the link between female audit committee membership (*WBOARDAUDC*) and firm performance. We start by using the median value (2.00) of female audit committee membership to divide our sample into firm-years with higher and lower proportion of *WBOARDAUDC*. Then, we examine structural differences between these subsamples by using mean difference test. Results reported in Table 18 show several differences in the observable characteristics of both subsamples. The impact of these observables differences is mitigated by the use of propensity score matching as discussed in Table 5. After the matching procedure is implemented, all the observable difference disappears.

Table 19 present the results of system GMM regression of female audit committee membership (*WBOARDAUDC*) on *WROA* using the PSM matched sample. In accordance with H3c, we expect that there is positive relationship between the appointment of female audit committee members and firm performance, and this relationship is more pronounced in the post-quota period. Model 1 in Table 19 show that the coefficient on *WBOARDAUDC* is positive and significant ( $\beta_2 = 0.016$ ,  $t = 3.04$ ), suggesting that there is a positive link between female audit committee membership and *WROA*. Results of Model 2 in Table 19 show that the coefficient on *QUOTA* is negative and significant ( $\beta_3 = -0.010$ ,  $t = -10.09$ ), whereas, the coefficient on *WBOARDAUDC* remains positive and significant. In the next step, we are now interested in testing the marginal effect of *WBOARDAUDC* on *WROA* in the post-quota period by using interaction between *WBOARDAUDC* and *QUOTA* in Model 3. We use difference-in-differences procedure and focus on the joint test of coefficients on *WBOARDAUDC* and its interaction with board gender quota legislation (*WBOARDAUDC*  $\times$  *QUOTA*). The findings of joint test are reported in Model 3

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suggest that female audit committee membership has a positive and significant relationship with *WROA*. Prominently, we find that the coefficient size as well as the level of significance increased substantially in the post-quota period ( $\beta_2 + \beta_4 = 0.045$ ,  $t = 10.58$ ).

Table 20 present the results of system GMM regression of female audit committee membership (*WBOARDAUDC*) on Tobin's Q using the PSM matched sample. In Model 1, we find that *WBOARDAUDC* has a positive and significant relationship with market performance of French firms ( $\beta_2 = 0.296$ ,  $t = 4.12$ ). In Model 2, we include the variable *QUOTA* to capture the effect of the enactment of gender quota law in France. We find that *QUOTA* is negatively related with Tobin's Q ( $\beta_3 = -0.062$ ,  $t = -6.68$ ). However, the coefficient on *WBOARDAUDC* remains positive and significant. In Model 3, we examine the marginal effect of *WBOARDAUDC* on Tobin's Q in the post-quota period, the results of joint test of coefficient suggest that the coefficient size as well as the level of significance increased substantially in the post-quota period ( $\beta_2 + \beta_4 = 0.446$ ,  $t = 9.27$ ). The empirical findings reported in Model 3 of Table 20 suggest that the positive association between *WBOARDAUDC* and Tobin's Q becomes even stronger in the post-quota period. Overall, the results reported above show that the appointment of female directors on audit committees positively affects profitability of French firms. In addition, the market also responds positively to the appointment of female directors on audit committees. These results are according to our expectation and confirm H3c.

To summarize, results reported in Table 12–20 provide considerable evidence to suggest that integration of female board members in various positions on corporate boards is more important than their mere presence on the boards. In the wake of board gender diversity reforms, our empirical results support Reberioux and Roudaut (2016)

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in that participation of female directors in important board committees is a more effective criteria to ascribe to board gender diversity, and it is associated with firm performance. In addition, our study provides evidence to suggest that French mandatory board gender quota legislation has been successful in breaking positional gender segregation within French corporate boards. Our findings support the view that female directors should be appointed to important board positions (e.g., independent directorship, audit committee membership) that allow them to be involved in strategic decision making and enable them to make economically meaningful impact on firm performance (Green & Homroy, 2018).



**Table 18: Mean difference test between firm-years with high proportion of female audit committee member and firm-years with low proportion of female audit committee member for entire and matched samples.**

Variable	Entire Sample			Matched Sample		
	Firm-years with high proportion of female audit committee members ( <i>n</i> = 761)	Firm-years with low proportion of female audit committee members ( <i>n</i> = 849)	t-test/Chi <sup>2</sup> <sup>a</sup>	Treatment group ( <i>n</i> = 568)	Control group ( <i>n</i> = 568)	t-test/Chi <sup>2</sup> <sup>a</sup>
<i>WROA</i>	4.76	4.68	0.32	4.49	4.39	0.35
<i>WQTOB</i>	1.16	1.22	-1.16	1.14	1.16	-0.34
<i>LBSIZE</i> (number of directors)	12.62	12.10	3.10***	12.41	12.50	-0.49
<i>BOARD_IND</i> %	51.79	46.17	5.41***	50.02	49.42	0.49
<i>LBMEET</i> (number of meetings)	7.41	6.88	3.47***	7.29	7.25	0.21
<i>AUDITCOM_SIZE</i> (number of members)	3.89	3.73	3.07***	3.81	3.78	0.56
<i>AC_IND</i> %	72.16	64.46	5.73***	69.82	71.26	-0.97
<i>LACMEET</i> (number of meetings)	4.85	4.52	3.14***	4.74	4.82	-0.63
<i>DUAL</i> (%)	59.40	55.24	1.68*	57.57	59.86	-0.78
<i>LCEOTEN</i> (number of years)	9.61	6.78	7.93***	8.27	8.09	0.42
<i>WCEO</i> (%)	2.23	0.94	2.09**	1.59	1.41	0.24
<i>FAM_OWN</i> (%)	23.44	25.40	-1.52	22.60	22.75	-0.10
<i>INST_OWN</i> (%)	31.73	24.94	4.68***	28.87	28.74	0.08
<i>WDEBT</i> (%)	22.66	23.88	-1.79*	23.60	23.36	0.29
<i>WRD</i> (%)	2.32	2.68	-1.53	2.44	2.47	-0.10
<i>CROSS</i> (%)	26.81	24.85	0.89	26.94	28.70	-0.66
<i>LNASSETS</i> (billions of euros)	21.98	19.00	1.71*	19.23	22.45	-1.52

This table reports the mean difference between firm with higher than median proportion of female audit committee member and firm year with lower than median proportion of female audit committee members before and after matching for proportion of female directors and control variables for a sample of French firms listed on SBF 120 index (1610 firm-year observations for 97 French firms for the period between 2002 and 2019). Propensity score matching of Rosenbaum and Rubin (1983) yields a matched sample consisting of 1136 cases: 568 treatment cases (firm with high proportion of female audit committee member and 568 comparison cases (firm with low proportion of female audit committee members). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

<sup>a</sup> t-tests are based on natural logarithm-transformed values.

Table 19: Regression of the ROA on the proportion of female audit committee members

Variable	Expected Sign <sup>a</sup>	Model 1		Model 2		Model 3	
		Coef.	t-test	Coef.	t-test	Coef.	t-test
<i>Lag ROA</i>	?	0.768***	49.23	0.724***	80.41	0.718***	73.37
<i>WBOARDAUDC</i>	+	0.016***	3.04	0.040***	12.16	0.035***	9.88
<i>QUOTA</i>	+			-0.010***	-10.09	-0.012***	-6.59
<i>WBOARDAUDC</i> × <i>QUOTA</i>	+					0.010**	2.38
<i>LBSIZE</i>	+	0.001	0.43	0.004***	2.71	0.005**	2.60
<i>BOARD_IND</i>	+	0.003	0.83	0.009***	3.03	0.008***	2.87
<i>LBMEET</i>	+	-0.001	-0.55	0.001	0.92	0.001	0.80
<i>AUDITCOM_SIZE</i>	+	-0.001	-1.19	-0.001***	-3.29	-0.001***	-3.15
<i>AC_IND</i>	+	0.002	0.64	-0.001	-0.27	0.001	0.10
<i>LACMEET</i>	+	-0.000	-0.10	-0.001	-0.82	-0.001	-1.34
<i>DUAL</i>	-	-0.001	-1.11	-0.002**	-2.50	-0.003**	-2.33
<i>LCEOTEN</i>	-	-0.000	-0.13	-0.001***	-2.70	-0.001***	-2.95
<i>WCEO</i>	+	-0.033***	-11.00	-0.036***	-18.73	-0.037***	-16.13
<i>FAM_OWN</i>	+	0.008	3.03	0.016***	6.32	0.016***	6.35
<i>INST_OWN</i>	-	-0.004*	-1.82	-0.004**	-2.50	-0.004**	-2.49
<i>WDEBT</i>	-	-0.017***	-4.29	-0.017***	-4.36	-0.015***	-3.71
<i>WRD</i>	+	-0.018	-1.43	-0.057***	-5.28	-0.062***	-5.25
<i>CROSS</i>	+	-0.003***	-2.85	-0.003**	-2.42	-0.003**	-2.21
<i>LNASSETS</i>	+	0.001	1.44	0.001*	1.84	0.001	1.61
Intercept	?	0.005	0.66	0.003	0.41	0.002	0.58
Industry	?		Yes		Yes		Yes
Number of observations			1099		1099		1099
Fisher (Prob > F, <i>p</i> -value):			1900.64 ( <i>p</i> = 0.000)		34280.22 ( <i>p</i> = 0.000)		29424.33 ( <i>p</i> = 0.000)
Arellano–Bond test AR(1) ( <i>z</i> , <i>p</i> -value):			-3.40 ( <i>p</i> = 0.000)		-3.44 ( <i>p</i> = 0.001)		-3.42 ( <i>p</i> = 0.000)
Arellano–Bond test AR(2) ( <i>z</i> , <i>p</i> -value):			0.56 ( <i>p</i> = 0.574)		0.67 ( <i>p</i> = 0.505)		0.69 ( <i>p</i> = 0.493)
Sargan test (Chi-square, <i>p</i> -value):			185.28 ( <i>p</i> = 0.000)		168.13 ( <i>p</i> = 0.000)		167.33 ( <i>p</i> = 0.000)
Hansen test (Chi-square, <i>p</i> -value):			47.92 ( <i>p</i> = 0.962)		76.92 ( <i>p</i> = 0.191)		76.16 ( <i>p</i> = 0.184)
Difference-in-difference test : <i>WBOARDAUDC</i> + <i>WBOARDAUDC</i> × <i>QUOTA</i>						0.045***	10.58

This table provides results of the system GMM regressions of ROA on the proportion of female audit committee members and quota law on a matched sample. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1136 cases: 568 treatment cases (firm with higher than median proportion of female audit committee member) and 568 comparison cases (firm with lower than median proportion of audit committee members). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

Table 20: Regression of TOBIN on the proportion of female audit committee members

Variable	Expected Sign <sup>a</sup>	Model 1		Model 2		Model 3	
		Coef.	t-test	Coef.	t-test	Coef.	t-test
<i>Lag WQTOB</i>	?	0.754***	82.61	0.733***	134.49	0.728***	114.86
<i>WBOARDAUDC</i>	+	0.296***	4.12	0.278***	11.35	0.159***	5.59
<i>QUOTA</i>	+			-0.062***	-6.68	-0.127***	-7.02
<i>WBOARDAUDC × QUOTA</i>	+					0.287***	6.34
<i>LBSIZE</i>	+	0.062	1.45	0.011	0.38	0.024	0.73
<i>BOARD_IND</i>	+	0.071	1.18	0.011	0.32	0.009	0.24
<i>LBMEET</i>	+	0.021	1.37	0.040***	3.45	0.044***	3.88
<i>AUDITCOM_SIZE</i>	+	0.016	0.99	0.016**	2.20	0.012	1.55
<i>AC_IND</i>	+	0.037	1.06	0.036	1.54	0.041*	1.75
<i>LACMEET</i>	+	-0.007	-0.20	0.005	0.43	-0.002	-0.14
<i>DUAL</i>	-	-0.029**	-2.12	-0.056***	-5.05	-0.049***	-3.88
<i>LCEOTEN</i>	-	-0.025**	-2.37	-0.015*	-1.95	-0.018**	-2.25
<i>WCEO</i>	+	-0.197***	-3.19	-0.253***	-5.40	-0.258***	-4.74
<i>FAM_OWN</i>	+	0.053	0.90	0.119***	3.18	0.123***	3.02
<i>INST_OWN</i>	-	-0.075*	-1.85	-0.077***	-3.11	-0.064**	-2.41
<i>WDEBT</i>	-	0.232***	3.25	0.330***	9.19	0.336***	9.11
<i>WRD</i>	+	0.228	1.18	0.065	0.55	-0.071	-0.48
<i>CROSS</i>	+	-0.055*	-1.80	-0.052***	-4.48	-0.057***	-4.12
<i>LNASSETS</i>	+	-0.025***	-3.11	-0.018***	-2.86	-0.019**	-2.46
Intercept	?	0.259*	1.70	0.239**	2.45	0.233**	2.40
Industry	?		Yes		Yes		Yes
Number of observations			1099		1099		1099
Fisher (Prob > F, <i>p</i> -value):		40405.24 ( <i>p</i> = 0.000)		73737.18 ( <i>p</i> = 0.000)		201363.45 ( <i>p</i> = 0.000)	
Arellano–Bond test AR(1) ( <i>z</i> , <i>p</i> -value):		-2.14 ( <i>p</i> = 0.000)		-2.16 ( <i>p</i> = 0.031)		-2.16 ( <i>p</i> = 0.031)	
Arellano–Bond test AR(2) ( <i>z</i> , <i>p</i> -value):		0.59 ( <i>p</i> = 0.554)		0.49 ( <i>p</i> = 0.627)		-0.51 ( <i>p</i> = 0.613)	
Sargan test (Chi-square, <i>p</i> -value):		930.11 ( <i>p</i> = 0.000)		960.59 ( <i>p</i> = 0.000)		960.02 ( <i>p</i> = 0.000)	
Hansen test (Chi-square, <i>p</i> -value):		65.36 ( <i>p</i> = 0.602)		78.20 ( <i>p</i> = 0.210)		75.16 ( <i>p</i> = 0.258)	
Difference-in-difference test : <i>WBOARDAUDC</i> + <i>WBOARDAUDC × QUOTA</i>						0.446***	9.27

This table provides results of the system GMM regressions of TOBIN's Q on the proportion of female audit committee members and quota law on a matched sample. Propensity score matching of Rosenbaum and Rubin (1983) is utilized to yield a matched sample consisting of 1136 cases: 568 treatment cases (firm with higher than median proportion of female audit committee members) and 568 comparison cases (firm with lower than median proportion of audit committee members). All variables are as defined in Table 1. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

## **Additional analysis**

### *Attributes of female directors*

Existing literature suggest that there are inherent differences between male and female directors on the basis of their attributes. For example, male and female directors differ from each other with regard to their work experience and skill proficiency (Singh et al., 2008), personal abilities and preferences such as risk taking and education (Bennouri et al., 2018). A review of existing literature suggests that appointment decisions of corporate directors are also based on their individual skills, abilities and experience (Güner et al., 2008; Johnson & Mamun, 2013). In this regard, Nekhili and Gatfaoui (2013) reported that the appointment of female directors to the corporate boards is dependent on their attributes such as their experience of corporate sector, educational qualification, and skills. Prior literature also highlights the link between attributes of corporate board members and board effectiveness. In this respect, Gull et al. (2017) demonstrate that consideration of attributes of female directors is important factor to examine the real effects gender diversity on corporate boards.

From the perspective of resource dependence theory, various scholars suggest that attributes corporate boards members are directly related to the performance of their firms (Johnson et al., 2013). Similarly, human capital theory also considers individual attributes (education, experience and expertise) to be a source of productivity for organizations (Becker et al., 1998). In this regard, Bennouri et al. (2018) argue that each female director brings her unique experience, educational background and expertise to corporate boards. The authors also demonstrate that the monitoring competence of French boards is associated with the set of abilities, knowledge and attributes of the female on the board of directors in addition to the gender.

In the context of gender diversity regulations on the corporate boards, it is important to investigate who is being appointed on the board and what characteristics the new (incumbent) directors are bringing to corporate boards (Reberioux & Roudaut, 2016). Keeping in view the importance of female directors' attributes, we further analyze whether these attributes affect the link between directorship of female and performance of the firm. We review the extant literature (e.g., Ahern & Dittmar, 2012; Bennouri et al., 2018; Gull et al., 2017; Singh et al., 2008) to choose the following attributes of female directors (namely, nationality, education, experience, multi-directorship and tenure).

#### *Descriptive analysis of attributes*

Table 21 presents the overall descriptive statistics for attributes of female directors. Based on our sample, we find that nationality (*MNATIONALITY*) of female directors appointed to French corporate boards has a mean value of 26.40, indicating that French listed firms have more than 26% foreign female directors on their boards. Female directors' education (*MFEDU*) is on average (mean) 84.87%, suggesting that majority of female directors appointed on French boards have business related education. Regarding the experience of female director (*MFEMEXP*), we find that 63.01% female directors are experienced. In other words, 36.99% female board members in our sample are newly appointed female directors. These results demonstrate that French mandatory board room gender quota is successful in opening the doors of corporate boards to the new population of female directors. The overall fraction of female directors holding numerous board positions (*MFEMMULT*) is 58.35%, indicating that more than half of the female directors are also working on corporate boards of other firms. On average (mean) Female director have tenure

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(*MFEMTEN*) of 4.5 years and it varies from a minimum of 0.5 years to a maximum of 19 years.

**Table 21: Descriptive statistics of female directors' attributes**

<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Minimum</b>	<b>Maximum</b>	<b>25th percentile</b>	<b>50th percentile</b>	<b>75th percentile</b>
<i>MNATIONALITY</i>	26.40	0.34	0	1	0	0	89.5
<i>MFEMEDU</i>	84.87	0.27	0	1	0.75	1	0.5
<i>MFEMEXP</i>	63.01	0.36	0	1	0.33	0.67	1
<i>MFEMMULT</i>	58.35	0.38	0	1	0.25	0.6	1
<i>MFEMTEN</i>	4.58	2.82	0.5	19	2.67	4	6

This table reports descriptive statistics following of female directors attributes: Nationality of female director either French national or foreign, Education of female director, Experience of female directors, Multi-directorship and Tenure as number of years in a firm.

*Trend analysis of attributes*

Table 22 indicates year-to-year variation in the attributes of female directors on boards of French firms for the time period from 2001 to 2019. We find an upward trend in the propensity of French firms to hire more foreign (*MNATIONALITY*) female directors. Clearly, the percentage of foreign female directors has increased over the years. Column 2 presents year wise alteration in the education (*MFEMEDU*) of female directors on French corporate boards. Educational level is defined as whether a female director has a business related education or not. Interestingly, our results indicate an upward trend in the tendency of firms to hire female directors having business related education until 2014 on French boards. As in the year 2014, 90.96% female directors were having business related education. However, the overall proportion of female directors having business related education decreased from 90.69 in 2014 to 81.97 in 2017. A plausible explanation for this decreasing trend can be the supply-side shortage of females directors having business education. It seems to comply with the minimum 40% requirement of female directors, French firms increasingly appointed female directors having no business related education after 2014. The year-to-year variation in the experience of female director (*MFEMEXP*), presented in Column 3 demonstrates a downward trend, indicating the appointment of less experienced or new female directors on French corporate boards. This trend is more evident in the aftermath of gender quota regulation.

Column 4 shows that there is a downward trend in the female director who sits on multiple boards of different companies (*MFEMMULT*). These results counter the concerns of some scholars that only few female directors may occupy the director positions on corporate boards of French firms (Bolshaw, 2011). These results also invalidate the fear of tokenism associated with obligatory reforms by appointing token



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female directors or unqualified directors to the boards just to comply with the mandatory gender quota law (Choudhury 2015; Smith 2018). Finally, we also report an upward trend in the tenure (MFEMTEN) of female board members.

Overall, these results imply that obligatory pressure to comply with minimum 40% representation of female directors forced French firms to appoint female directors who are foreigners, having less business related education, have less experience, are less likely to hold directorship in other firms and to retain them for a longer period. In order to statistically evaluate the occurrence of trends for these attributes of females directors, we run a Mann–Kendall test; the null hypothesis of no trend over time was rejected for all variables.

**Table 22: Trend of female directors' attributes**

Year	MNATIONALITY	MFEMEDU	MFEMEXP	MFEMMULT	MFEMTEN
2001	19.89	72.04	56.18	76.61	1.76
2002	20.72	77.93	55.18	79.05	2.78
2003	25.42	82.08	58.54	81.87	3.53
2004	21.48	84.07	59.82	75.37	4.10
2005	19.73	82.31	59.52	66.50	4.51
2006	18.83	82.41	63.58	67.75	5.05
2007	16.81	86.38	62.97	70.68	5.41
2008	17.92	85.78	63.31	70.06	5.34
2009	21.53	84.05	64.97	71.59	5.67
2010	23.84	84.18	64.35	66.67	4.87
2011	25.56	85.59	66.76	61.87	4.22
2012	27.35	86.63	65.67	55.63	4.44
2013	29.20	89.95	62.80	52.29	4.35
2014	31.21	90.69	61.55	45.73	4.31
2015	29.77	88.14	62.20	44.55	4.72
2016	31.04	86.81	62.12	39.86	4.59
2017	32.07	81.97	64.84	49.03	4.30
2018	31.98	82.54	64.26	49.99	5.02
2019	31.85	81.59	65.22	53.32	5.49
Total	26.40	84.80	63.00	58.40	4.58
Analysis of variance for mean difference test : F-value ( <i>p</i> -value)	1.68 (0.036)*	1.34 (0.155)	0.38 (0.990)	8.31 (0.000)*	5.31 (0.000)*
Mann–Kendall test: Z-value ( <i>p</i> - value)	9.77 (0.000)*	−3.79 (0.000)*	−1.23 (0.000)*	−10.43 (0.000)*	7.19 (0.000)*

This table provides yearly variation in the attributes of female directors. Column 1 represents Nationality of female director either French national or foreign, column 2 represents Education of female director, column 3 represents Experience of female directors, column 4 represents Multi-directorship and column 5 represents tenure as number of years in a firm. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

*Attributes of female directors and firm performance:*

We perform additional analysis to examine whether the link between board gender diversity and firm performance is affected by the attributes of female directors. To do so, we again estimate our model given in Equation (1) by considering the attributes of female directors. Based on prior literature, we use nationality, education, experience, multi-directorship and tenure to capture female directors' attributes. Table 23 presents the results of system GMM on our measures of firm performance (ROA and Tobin's Q) in Model 1 and Model 2, respectively. If after incorporating female directors attribute the significant relationship between board gender diversity and firm performance disappears, this would imply that the skills of new (incumbent) female directors are more important to the performance of firms as compare to the gender. The results reported in Table 23 are qualitatively similar to those reported in Table 6–11, after the inclusion of female director attributes in our regression model. Specifically, we find that accounting-based measure of firm performance (*WROA*) is positively and significantly associated with the proportion of female directors' on board, while market-based measure of firm performance (Tobin's Q) is negatively linked with the female directorship.

Regarding female director attributes, we find that the nationality (*MNATIONALITY*) of female directors has a negative relationship with both measures of firm performance. These results are in line with the findings of Bennouri et al. (2018) in France and Gracia et al. (2015) in international banks. A plausible explanation is that unfamiliarity of foreign directors with local culture, governance structures and accounting practices restrain them to exert their full potential in foreign firms and outweigh the potential benefits of diverse intellect, skills and experience. Furthermore, market investors also do not give favorable response towards

appointment of foreign female directors on French boards. In line with the findings of Bennouri et al. (2018), we also find a negative relationship between female directors' education (*MFEMEDU*) and firm performance. Johnson et al. (2013) argue that to capture the impact of educational background on the association between educational variables and underlying constructs, it is not sufficient to estimate the educational level only. Furthermore, female directors' experience (*MFEMEXP*) is also negatively associated with both measures of firm performance. This represents that stakeholder perceive female director working experience as undesirable. Experience does not have any significant association with accounting-base performance of French firms. Consistent with the findings of Matsa and Miller (2013), we also report negative relationship between female directors' tenure (*MFEMTEN*) and firm performance. The author highlight that the shortages of qualified female directors was an important factor leading to less occupied female directors in comparasion to their male colleague. Female directors' multi-directorship (*MFEMMULT*) is positively related to accounting-based measure of firm performance but negatively related to Tobin's Q. These results indicate that female directors working on multiple boards are perceived negatively by the market.

To summarize, our descriptive statistics and trend analysis of the attributes of female directors lend support to the idea that the post-quota female directors have better attributes on average as identified by Ferreira et al. (2017). With regard to accounting and market-based performance of French listed firms, we show that female directorship significantly affects ROA and Tobin's Q, even after the inclusion of a set of female directors' attributes. These results are qualitatively similar to those reported in Table 6–11 and in line with the findings of Bennouri et al. (2018) regarding the

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effect of female directors' attributes and their link with accounting and market-based measures of firm performance.

**Table 23: Regression of the ROA and TOBIN on the proportion of female directors and female directors' attributes**

Variables	Predicted sign	Model 1		Model 2	
		ROA Coef.	t-test	TOBIN Coef.	t-test
<i>Lag ROA</i>	?	0.679***	29.14		
<i>Lag WQTOB</i>	?			0.668***	33.05
<i>WBOARD</i>	?	0.139***	10.54	-1.200***	-3.15
<i>QUOTA</i>	?	0.001	0.56	0.002	0.05
<i>MNATIONALITY</i>	?	-0.079***	-7.94	-0.987***	-5.31
<i>MFEMEDU</i>	?	-0.037***	-5.14	-1.699***	-8.68
<i>MFEMEXP</i>	?	-0.013	-1.25	-0.817***	-5.56
<i>MFEMMULT</i>	?	0.025***	2.64	-0.827***	-5.42
<i>LNFMETEN</i>	?	-0.010***	-3.74	-0.424***	-7.60
<i>LBSIZE</i>	+	0.016***	3.77	-0.204	-1.20
<i>BOARD_IND</i>	+	0.013	1.10	0.828***	4.34
<i>LBMEET</i>	+	0.004*	1.67	0.120**	2.21
<i>AUDITCOM_SIZE</i>	+	0.001	0.73	0.015	0.51
<i>AC_IND</i>	+	0.012	1.58	-0.036	-0.32
<i>LACMEET</i>	+	0.006*	1.95	-0.145**	-1.97
<i>DUAL</i>	-	0.004	1.14	-0.021	-0.27
<i>LCEOTEN</i>	-	0.001	1.01	0.049	1.52
<i>WCEO</i>	+	0.031***	3.09	-0.787***	-4.23
<i>FAM_OWN</i>	+	0.007	0.89	0.468**	2.35
<i>INST_OWN</i>	-	0.014**	2.34	0.053	0.31
<i>WDEBT</i>	-	0.015	1.36	1.421***	4.95
<i>WRD</i>	+	0.007	0.28	2.073***	2.85
<i>CROSS</i>	+	-0.007**	-2.03	0.028	0.21
<i>LNASSETS</i>	+	0.002*	1.83	-0.064**	-2.09
<i>Intercept</i>		-0.003	-0.15	3.243***	7.74
<i>Industry</i>		Yes	Yes		
Number of obs.		856		856	
F (Prob > F)		2095.95 (p = 0.000)		10263.78 (p = 0.000)	
Arellano–Bond test AR(1) (z, p-value):		-3.28 (p = 0.001)		-3.34 (p = 0.001)	
Arellano–Bond test AR(2) (z, p-value):		0.33 (p = 0.620)		0.30 (p = 0.764)	
Sargan test (Chi-square, p-value):		696.90 (p = 0.000)		535.67 (p = 0.000)	
Hansen test (Chi-square, p-value):		73.41 (p = 0.152)		69.81 (p = 0.232)	

This table presents regression estimates of the system GMM regressions of ROA and TOBIN on the proportion of female directors and following attributes of female directors: Nationality of female director either French national or foreign, Education of female director, Experience of female directors, Multi-directorship and tenure as number of years in a firm. \*, \*\*, \*\*\* represent significance at 10 percent, 5 percent and 1 percent levels, respectively.

## **Chapter 5: Discussion and conclusion**

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Policy makers across various jurisdictions have introduced corporate governance reforms to enhance boardroom gender diversity (i.e., female access to corporate boards) with an aim to break down the monopolistic masculine power on boards. Such reforms explicitly stress the importance of gender diversity on corporate boards (Arfken et al., 2004; Adams & Ferreira, 2009). Diversity reforms have been executed internationally in the form of compulsory board gender quotas, modifications in codes of governance, and disclosure requirements (Adams, 2016). Various legislative initiatives have also been based on the business case view that the incorporation of females on boards could affect the economic performance of businesses in significant ways. Two European directives (European Commission, 2012 a, b) also justify corporate board gender quotas in support of the business case argument. Despite being controversial, gender quotas have been promoted as a tool for ensuring gender-balanced representation of women on corporate boards (OECD, 2012). The underlying assumption of quota reforms is to mitigate the token presence of female directors and ensure a critical mass (i.e., a sufficient number of female board directors) to guarantee a desirable level of influence from female directors (Strydom et al., 2016).

Boardroom gender quotas are introduced as the “ultimate option” to accelerate the progress of females in the top echelons of the business world. However, the desirability and efficiency of corporate board gender quotas to escalate females' representation on boards is debatable. Opponents of board gender quotas argue that the quota approaches are attached to fears such as a violation of meritocracy, the appointment of unqualified females, token female directors, and multi-directorship. Still, board gender quotas are widely advocated for as necessary measures to prohibit discrimination, gender segregation, and glass ceilings (Grosvold & Brammer, 2011).

Across different countries, empirical evidence is mixed regarding the link between gender quota legislation and firm performance. While some studies report a positive link (Ferrari et al., 2018; Lucas-Pérez et al., 2015; Reguera-Alvarado et al., 2017), others report a negative link (Ahern & Dittmar, 2012; Matsa & Miller 2013; Voß, 2015) or even being value-neutral (Dale-Olsen et al., 2013). However, the differing results of these studies could be due to various factors such as the choice of sample, the estimation method, and the institutional environment. Extant literature highlights that corporate board gender quotas are highly contextualized and embedded in particular regulatory environments. Moreover, the legislated procedure and requirements also affect the law's potential to bring change (Lépinard, 2018; Paxton & Hughes, 2015; Schwindt-Bayer, 2009). To this end, this dissertation presents an empirical analysis of the effect of gender diversity in corporate boards on firm performance in the French context following the enactment of mandatory board gender legislation.

The French parliament enacted the Cope-Zimmerman law in January 2011, which requires French listed firms to ensure their boards include at least 40% female directors by 2017 with a transitional threshold of 20% in 2014. This mandatory board gender quota law was backed with sanctions for non-compliance, ranging from the termination of the recruitment of male directors and momentary deferral in payment of director's fee to the annulment of firm registration. The motivation for this dissertation is drawn from the conflicting results of preliminary studies with respect to the effect of mandatory board gender quota on firm performance in the French context (Sabatier, 2015; Comi et al., 2019). The phenomena of "glass ceiling" (Nekhili & Gatfaoui, 2013) and "positional gender segregation" (Reberioux & Roudaut, 2016) were also motivating factors for this study. Additionally, the supply of qualified female directors (Singh et al., 2015), the attributes of appointed female directors in compliance with



mandatory law, and the occurrence of “Golden Skirts” (few women occupying multiple board seats) were also driving factors in analyzing the attributes of female directors assigned to French boards in compliance with the mandatory gender quota reform. The objective of this dissertation was to examine the impact of female presence on accounting and market-based measures of firm performance (ROA and Tobin’s Q)—particularly after the promulgation of mandatory gender quota legislation—and the effectiveness of mandatory reform with respect to target achievement (i.e., whether the required percentage is achieved or not). Further, this dissertation was designed to investigate how board gender diversity policies affect the inner workings of a board in light of the evidence of double glass ceilings and positional gender segregation. Additionally, keeping in mind the criticism of mandatory legislation, this dissertation also scrutinized the attributes of female directors (nationality, education, experience, multi-directorship and tenure) and their impact on firm performance.

In order to achieve our research objectives, we utilized a sample based on all the firms in the SBF120 index listed on Euronext Paris over the period 2001-2019. We used four different proxies to measure boardroom gender diversity. Specifically, we used the proportion of female directors, the number of female directors, the *Blau* index of gender diversity, and the *Shannon* index of gender diversity to appropriately capture board gender diversity. For our dependent variable, we used accounting and market-based measures (i.e., ROA and Tobin’s Q), as both were commonly used to capture corporate performance in prior literature. We used three categories of control variables. The first category controlled for the following attributes of corporate boards (and audit committee): size, independence, and number of meetings. The second category controlled for the effects of corporate leadership such as CEO/Chairperson duality, presence of a female CEO, and CEO tenure. The third category controlled for

ownership structure, firm riskiness, firm growth, and firm size. Additionally, industry and year dummies were included to control for the effects caused by variations in time and industry.

Existing literature has identified that while examining the issue of board gender diversity and its relation with firm performance, researchers should carefully consider the issue of endogeneity (Adams & Ferreira, 2009). For instance, a recent study conducted by Eckbo et al. (2016) contested the validity of the negative results found by Ahern and Dittmar (2012) regarding the effectiveness of gender quota legislation and illustrated that the inverse market reaction was turned non-significant by using a more robust analysis that appropriately addressed the problem of endogeneity. Despite presenting a “business case” argument for gender diversity by consultancy companies (e.g., Catalyst, 2007; Mckinsey, 2007), researchers have been hesitant to rely on these results because they do not control for endogeneity concerns (Adams, 2016). The issue of endogeneity may arise due to various factors such as selection problems, unobservable heterogeneity, simultaneity, or measurement errors. To mitigate the issue of endogeneity, we first controlled for selection bias by performing Propensity Score Matching (PSM) between firms with higher than the median proportion of female directors and firms with lower than the median proportion of female directors (Rosenbaum & Rubin, 1983). Second, we applied the system GMM (Generalized Method of Moments) estimation technique as our main estimation approach to address the apprehension of endogeneity arising from different sources (Blundell & Bond, 1998). This methodology helps to obtain consistent results and prevents biases arising from endogeneity issues (Flannery & Hankins, 2013; Roodman, 2009; Wintoki et al., 2012). For robustness, we also used a difference-in-differences approach to examine

the marginal impact of board gender diversity on firm performance in the post-quota period.

Overall, our empirical findings suggest a positive relation between board gender diversity and accounting-based performance and negative relation between board gender diversity and market-based performance. Consistent with prior literature, we report that the interaction between board gender diversity and firm performance is not uniform for both measures of performance. With regard to the moderating effect of female directors on firm performance after the promulgation of mandatory board gender quota legislation, we report a positive link between female directorship and both measures of firm performance and this link is strengthened in the post-quota period. A striking result derived from our findings is that the increased proportion of female directors by virtue of the mandatory gender quota legislation has altered the negative perception of market participants into positive. The analysis of year wise trend reveals that French firms have achieved the desired level of female directors on board i.e. 40% presence in compliance with mandatory board gender quota legislation.

With regard to the position assigned to female directors, it is evident from the results that the number of female independent directors and female audit committee members grew substantially over the years as compared to female inside directors. At the same time, the size of board does not change significantly. These results suggest that the French boards have appointed new female directors by replacing the male directors rather than by increasing the board size. In this respect, we report the evidence that female directors are assigned important positions on French corporate boards by appointing them as audit committee members and independent directors thereby; contradicting to the opponents of mandatory quota approach that obligatory reform will give rise to token female directors (Choudhury, 2015; Smith, 2018). As such, our result

also refutes the occurrence of “gender base positional segregation”, and double glass-ceiling as identified in the prior literature (Nekhili & Gatfaoui, 2013; Reberioux & Roudaut, 2016). More importantly, we show that the appointment of female director to audit committees and independent directorship is positively related to firm performance, while female inside directors working on board only is negatively related to firm performance. In the wake of board gender diversity reforms, our empirical results support Reberioux and Roudaut (2016) in that participation of female directors in important board committees is a more effective criteria to ascribe to board gender diversity, and it is associated with firm performance. Our findings support the view that female directors should be appointed to important board positions (e.g., independent directorship, audit committee membership) that allow them to be involved in strategic decision making and enable them to make economically meaningful impact on firm performance.

Furthermore, we shed light on the attributes of female directors by performing additional analysis of their attributes (education, nationality, multi-directorship, experience and tenure). Our findings reveal that new female directors are equally qualified and do not hold too many board positions. Thereby, we document the absence of “Golden Skirts” in French mandatory board gender diversity specimen. Taken together, the findings reported in this dissertation give support to the argument that mandatory board gender reforms are more efficient in bringing gender diversity on boards and are positively linked with the economic performance of firms. Thus, providing female access to upper echelons of corporate world by the virtue of mandatory gender quotas seems beneficial for all corporate stake holders.

With respect to the theoretical perspective, our findings support the view that board gender diversity positively affects firm performance. In the context of agency

theory, independent directors and active monitoring are two important mechanisms to reduce agency problems. In this regard, our findings suggest that the Cope-Zimmerman law has strengthened these mechanisms of French corporate boards. As such, the appointment of female independent directors and presence of female directors on audit committees has not only increased the monitoring ability of boards but also the performance of French firms. With reference to human capital theory, attributes of board members (e.g., education, experience and skills) are directly related to the productivity of the firms. Our analyses of female director's attributes suggest that female directors appointed on corporate boards in the aftermath of gender quota legislation have better attributes. Therefore, the Cope-Zimmerman law seems to be successful by facilitating the incorporation of female members having diverse attributes. With regard to institutional theory, our findings suggest that obligatory reforms play an important role in the achievement of intended target. Alternatively, it can be said that the success of mandatory board gender quota legislation is partially due to the presence of coercive pressure (sanctions imposed by the government).

### *Contribution*

This dissertation contributes to the literature on corporate governance, particularly the emergent field of literature that focuses on mandatory board gender reforms and their effect on the composition of corporate boards. The current dissertation empirically explores the moderating effect of mandatory gender quota legislation on the link between female directorship and firm performance in the French context. The majority of existing empirical studies on the link between corporate performance and boardroom gender diversity reforms are based on the Norwegian context (Ahern & Dittmar, 2012; Bøhren & Staubo, 2014; Dale-Olsen, Schøne, & Verner, 2013; Eckbo et al., 2016; Matsa & Miller, 2013; Nygaard, 2011; Voß, 2015).

Whereas, a handful of academic research has also investigated the effect of such reforms on corporate performance in other jurisdictions such as the UK, Italy, Sweden, Germany and Spain (Brahma et al., 2020; Comi et al., 2019; Fedorets et al., 2019; Ferrari et al., 2018; Hinnerich & Jansson, 2017; Labelle et al., 2015; Lucas-Pérez et al., 2015; Reguera-Alvarado et al., 2017; Reddy & Jadhav, 2019). The findings of these studies suggest that mandatory board gender quota negatively affected the market value of Norwegian firms (Ahern & Dittmar, 2012; Matsa & Miller, 2013; Voß, 2015), in contrast it had a positive effect on the performance (measured by stock market returns) of Italian listed firms (Ferrari et al., 2018). Just two studies have examined the initial impact of the gender quota law on firm performance in the French setting. First, Sabatier (2015) examined the initial impact of gender diversity reforms on a sample of CAC40-listed French companies from 2008 to 2014 and reported a positive impact of gender diversity reforms on firm performance. Second, Comi et al. (2019) used a dataset from 2004 to 2014 and reported a negative effect of gender diversity reforms on the productivity of French firms. To the best of our knowledge, since the full implementation of the Cope-Zimmerman law, no other study has empirically examined the effect of mandatory gender quota legislation and firm performance in the French context. In this respect, this dissertation is the first attempt to shed light on the French listed firms' compliance with this law and to investigate its effect on their accounting and market-based performance (i.e., ROA and Tobin's Q, respectively). Using a sample of French firms listed in the SBF 120 index from 2001 to 2019, the empirical findings presented in this dissertation complement the initial results of Sabatier (2015) by demonstrating a positive impact of mandatory board gender quota legislation on firm performance.

Further, our study also contributes to the literature by demonstrating that the effect of female directorship on firm performance is affected by the positions assigned to female directors on corporate boards. We also extend the current literature by going beyond the economic effects of mandatory gender quota legislation and exploring the positions assigned to female directors in the post-quota period. In this regard, our study responds to the call for evidence on positional gender segregation in the post-quota period (Reberioux & Roudaut, 2016). Our findings show that there has been an increasing trend of appointing female directors to key monitoring positions on French corporate boards (as audit committee members and independent directors) since the implementation of the gender quota legislation. Further, we observed a decreasing trend of appointing female inside directors, who reduce firm profitability. These findings suggest that mandatory gender quota legislation seems to be successful in breaking the double glass ceiling and positional segregation (Nekhili & Gatfaoui, 2013; Reberioux & Roudaut, 2016) for female directors in the France and refutes concerns of appointing token female directors in the post-quota period (Choudhury, 2015; Smith, 2018). Finally, the dissertation responds to the call for research to consider the attributes of female directors appointed in the aftermath of the urgency brought on by mandatory gender quota legislation. Specifically, we contribute to the literature by shedding light on the year-wise variation in the attributes of female directors (i.e., education, nationality, multi-directorship, experience, and tenure) following the enforcement of gender-quota legislation. We also show that the link between board gender diversity and firm performance remains unchanged even after controlling for the attributes of female directors.

## *Implications*

From a policy perspective, the French boardroom gender quota clearly seems to be successful regarding the appointment of female directors to boards, as well as positively affecting the accounting and market-based performance of French corporations. From an operational standpoint, the success of the French mandatory boardroom gender quota is demonstrated by the integration of female board members into governance mechanisms (Guo & Masulis, 2015; Green & Homroy, 2017). As French context is marked with weak investor protection, female directors can positively contribute to corporate performance by asserting their monitoring ability and by lowering agency costs. Furthermore, as the findings of this dissertation demonstrate that French firms have begun to appoint female directors to important monitoring positions on their corporate boards (e.g., as independent board members and audit committee members) in the post-quota period, the phenomenon of double glass ceiling seems to be broken for female directors in France (Nekhili & Gatfaoui, 2013; Reberioux & Roudaut, 2016). In light of our findings, it is clear that the positive results of board gender quotas are dependent upon the integration of female directors into governance mechanisms rather than the mere representation of female directors on boards. The empirical findings of this dissertation may help policy makers in many countries that have implemented (or are in the process of implementation) board gender quota reforms. Accordingly, providing female directors access to the decision-making processes in the upper echelons of corporate boards should be the specific interest for regulators, practitioners, and corporate stakeholders rather than imposing gender quota solely for representative purposes.



### *Limitations and direction for future studies*

Like other studies, this dissertation has some caveats that leave room for further research. First, our study shows that the compulsory regulation in the form of Cope-Zimmerman law has positively contributed towards the economic performance of French listed firms. Another promising dimension is to study the marginal effect of enhanced proportion of female directors on the ethical and social dimensions of French firms such as earning management, quality of financial statements, and corporate social responsibility. Second, we show that French firms have not only complied with mandatory gender quota legislation by appointing 40% female directors on their corporate boards, but also appointed them on key monitoring positions of boards. Future studies may explore whether more female directors have reached leadership positions such as CEO or board chair. In other words, it would be interesting to explore the effect of compulsory gender diversity reforms from top to bottom. Third, the relationship between board gender diversity and firm performance is prone to the issue of endogeneity. In order to alleviate the endogeneity concerns and to confirm the robustness of our empirical findings, we utilized propensity score matching, system GMM estimations, and the difference-in-differences technique. Still, we fear that the endogeneity concerns cannot be ruled out with full certainty. Fourth, while this dissertation focuses on the positions assigned to female directors on boards and their attributes, the selection process of the appointment of female directors in the post-quota legislation is also an interesting topic yet to be explored. Fifth, our study investigated the impact of mandatory gender quota legislation. The literature provides evidence that different country-specific institutional factors play an important role in introducing board gender diversity reforms (Grosvold, Rayton, & Brammer, 2016). So, it would be a challenging opportunity to examine the process of introducing mandatory board

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gender quota legislation. Finally, an inherent limitation of this study is that we consider a sample of French firms listed on the SBF120 index in our analyses; future studies may take a sample of all French listed firms to investigate the variation in compliance with the mandatory board gender quota between big and small French firms.

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## Résumé en Français

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La question de la diversité du genre au sein du conseil d'administration a reçu une attention croissante de la part des chercheurs, des parties prenantes, des entreprises et des décideurs politiques au cours des deux dernières décennies. Malgré la volonté politique d'égalité de genre et d'égalité des chances, la représentation des femmes dans les conseils d'administration est restée très faible. Un rapport de l'OCDE de 2003 montre que la proportion moyenne de femmes membres des conseils d'administration était de 15,2 % au Royaume-Uni, 5,3 % en France, 1,9 % en Italie et 3,3 % en Espagne. Les décideurs politiques du monde entier ont réagi en prenant des initiatives sous la forme de réglementation obligatoire ou volontaire visant à accroître la présence de femmes au sein des conseils d'administration. Par exemple, 32 pays ont introduit des réformes de la diversité de genre dans les conseils d'administration sous la forme de quotas ou de recommandations dans les codes de gouvernance entre 2008 et 2015 (Adams, 2016). Dans ce contexte, douze États membres de l'Union européenne ont mis en place des quotas du genre au sein du conseil d'administration, cinq États ont introduit des quotas obligatoires assortis de sanctions (France, Belgique, Italie, Allemagne et Portugal), deux États ont mis en œuvre des quotas volontaires sans sanctions (Pays-Bas et Espagne) et cinq États ont introduit des réglementations uniquement pour les entreprises publiques (Autriche, Danemark, Finlande, Grèce et Slovaquie). Ainsi, l'amélioration de la diversité du genre au niveau du conseil d'administration est devenue une partie de l'agenda mondial pour la promotion de l'égalité des genres dans la société.

Le regain d'intérêt pour la participation des femmes dans les conseils d'administration (Brahma, Nwafor, & Boateng, 2020; Joecks, Pull, & Vetter, 2013; Liu,

Wei, & Xie, 2014; Perryman, Fernando, & Tripathy, 2016) date depuis longtemps. Les scandales qui ont touché les entreprises lors de la dernière décennie et la crise économique de 2008 ont conduit à une approche beaucoup plus contemplative concernant l'efficacité du conseil d'administration. Les scandales très médiatisés sur la qualité des rapports financiers dans les entreprises européennes et américaines (par exemple, Enron, Parmalat, Tyco et WorldCom) ont soulevé de sérieuses questions concernant le fonctionnement des conseils d'administration dans l'exercice de la fonction de contrôle. Ces scandales d'entreprises ont également suscité des inquiétudes des médias et du grand public concernant le fonctionnement interne des conseils d'administration. Par exemple, suite à l'échec de Lehman Brothers, des médias tels que le Wall Street Journal et Business Week ont soulevé des inquiétudes concernant le fonctionnement des conseils d'administration en posant la question « Où était le conseil d'administration de Lehman ? » (Johnson & Mamun, 2012). Les réformes de gouvernance telles que la législation Sarbanes-Oxley (aux États-Unis) et la Higgs Review (au Royaume-Uni) se sont concentrées sur la composition des conseils d'administration des entreprises. Le rapport Higgs et Tyson de 2003 suggère quant à lui que les conseils d'administration doivent mieux contrôler le recrutement d'administrateurs.

Tout en essayant de répondre aux questions sur l'efficacité du conseil d'administration et l'amélioration des performances, les chercheurs ont mis l'accent sur la diversité du genre au sein du conseil d'administration. Dans l'ensemble, les études montrent que l'augmentation de la diversité du genre dans les conseils d'administration peut améliorer le processus de prise de décision, car elle implique de garder à l'esprit différents points de vue et opinions et d'évaluer différents résultats (Chen, Liu, & Tjosvold, 2005; Daily & Dalton, 2003). La diversité dans la configuration du conseil

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d'administration est définie comme un mélange varié d'attributs, de capacités et d'expertise que des membres distincts apportent au conseil (Van der Walt & Ingley, 2003). Par conséquent, la diversité est valorisée et signifie comme une préoccupation stratégique de l'entreprise (Campbell & Mínguez-Vera, 2008). Les partisans de la diversité soutiennent que l'hétérogénéité des approches de prise de décision et de résolution de problèmes produit de meilleures décisions en raison d'un plus large éventail de perspectives, d'une amélioration de la communication et d'une analyse critique plus détaillée des problèmes. À cet égard, Adam et Ferreira (2009) soutiennent que les femmes n'appartiennent pas au "old boys club", les femmes exécutent leurs responsabilités de contrôle des dirigeants de manière plus indépendante. La littérature existante décrit que l'une des dernières tendances du conseil d'administration pour traiter des questions de gouvernance d'entreprise est la considération de différents types de diversité dans le conseil d'administration (Hillman, Cannella, & Harris, 2002). La diversité est globalement classée en deux groupes distincts, à savoir démographique et statutaire (Gull, Nekhili, Nagati, & Chtioui, 2017; Milliken & Martins, 1996; Pelled, 1996). La diversité démographique implique des caractéristiques observables telles que le genre, l'âge, la qualification académique alors que la diversité statutaire fait référence à des caractéristiques non observables telles que les connaissances, l'expertise et les capacités intellectuelles des individus.

Les décideurs politiques justifient l'augmentation de la diversité du genre au sein du conseil d'administration sur la base d'arguments commerciaux (Bilimoria, 2000). La participation des femmes au conseil d'administration améliore les ressources intellectuelles en incorporant un capital humain diversifié qui offre aux entreprises un avantage concurrentiel et a des implications sur la performance (Dezsö & Ross, 2012; Doldor, Vinnicombe, Singh, Point, & Moulin, 2015). L'analyse de la rentabilité est

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basée sur « comment et pourquoi » l'intégration des femmes administrateurs dans les conseils d'administration peut améliorer les performances (Cox, 1991; Van der Walt & Ingley, 2003). Elle est également basée sur la prise de conscience de l'importance de la diversité et qu'il existe des différences significatives dans les compétences des femmes et des hommes. Les arguments commerciaux soulignent que les femmes représentent près de la moitié de la proportion dans la société. Par conséquent, la présence des femmes dans le lieu de travail conduira à une utilisation appropriée des ressources disponibles (Adams & Flynn, 2005; Shilton, McGregor, & Tremaine, 1996; Wang & Clift, 2009). Deux directives de la Commission européenne (2012 a et b) valident l'argument commercial en faveur de la diversité du genre dans les conseils d'administration en affirmant que la diversité du genre au sein des conseils d'administration conduira à une utilisation appropriée des ressources humaines et à un développement économique durable.

Alors que l'importance des femmes dans les conseils d'administration est reconnue depuis longtemps, les progrès des femmes en termes de mandat d'administrateur ne sont pas significatifs (Arfken et al., 2004; Daily, Certo, & Dalton, 1999; Tarjesen et al., 2009). Diverses études mettent en évidence les problèmes rencontrés par les femmes lorsqu'elles postulent à des postes d'administrateurs sont liés aux stéréotypes (Fitzsimmons, 2012) au plafond de verre (Arfken et al., 2004; Bergeron et al., 2006; Terjesen et al., 2009), à la ségrégation verticale (Poggio, 2010) et à la discrimination de genre (Broome, 2008; Rebérioux & Roudaut, 2016). Parallèlement, il existe de nombreux autres obstacles dans la sélection des femmes au sein des conseils d'administration. Parmi les obstacles documentés, Burke (2000), Holton (2000) ont identifié les critères de sélection marqués par des valeurs traditionnelles et des liens étroits avec le « réseau d'hommes » ainsi que la prévalence d'« un certain monolithisme

» (monolithisme incertain) (Chandler, 2016). Ces processus de recrutement ambigus, associés à des exigences rigoureuses en matière d'expérience en matière de gouvernance, agissent comme des processus de contrôle pour les candidates. En fait, tous ces processus signalent l'existence d'un sexisme systématique dans la sélection des cadres supérieurs. Cet examen minutieux est encore plus poussé pour les femmes que pour les hommes (Hillman et al., 2000; Singh et al., 2015). D'autre part, une présence symbolique de femmes administrateurs est signalée dans de nombreux pays (Daily & Dalton, 2003; Kanter, 1977; Terjesen et al., 2009). Les chercheurs ont identifié une « masse critique » d'au moins trois membres de n'importe quel groupe de genre pour une contribution efficace et positive (Kanter, 1977; Konrad et al., 2008; Torchia, 2011).

Le manque de représentation des femmes dans les conseils d'administration a également attiré l'attention des médias et du public (Labelle, Francoeur, & Lakhal, 2015). Après l'échec des approches douces pour accélérer l'avancement des femmes administratrices (Ross-Smith & Bridge, 2008), la réglementation semblent être une option attrayante pour les décideurs politiques et les régulateurs. Dans le même temps, des initiatives prises au niveau privé telles que l'European Professional Women's Network (EPWN) et le Conseil canadien de la diversité des conseils d'administration ont fait pression sur les gouvernements pour qu'ils prennent des initiatives pour augmenter la proportion de femmes administratrices (Labelle et al., 2015). Compte tenu de la pression intense et de la lenteur de la réaction des entreprises, les gouvernements du monde entier ont pris des initiatives pour améliorer la diversité du genre au sein du conseil d'administration sous la forme d'une législation sur les quotas de genre ou de recommandations dans le code de gouvernance d'entreprise.

Les politiques de diversité au sein du conseil d'administration ont pris diverses formes, allant de quotas (par exemple, obligatoires ou volontaires) à des initiatives

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douces telles que des modifications du code de gouvernance, des exigences de divulgation et des objectifs (Adams, 2016; Klettner et al., 2016). Les quotas sont le pourcentage ou le nombre autorisé de chaque genre requis par les régulateurs de l'industrie ou les gouvernements, décrits avec un mécanisme de mise en œuvre (Sojo et al., 2016). La justification du pourcentage ou du nombre de chaque groupe de genre spécifié dans les règlements sur les quotas est d'assurer la « masse critique » de chaque groupe de genre nécessaire pour apporter une contribution positive (Singh, Point, Moulin, & Davila, 2015). Bien que controversés, les quotas de genre au sein des conseils d'administration sont introduits comme mécanisme de recours contre l'accession lente et de longue date des femmes aux postes de direction dans l'entreprise. Les opposants aux quotas prétendent qu'ils violent la méritocratie (Holzer & Neumark, 2000), car les exigences imposées créeront une énorme demande de réalisatrices qui peut créer une pénurie de femmes qualifiées du côté de l'offre (Ahern & Dittmar, 2012). Pourtant, les quotas de genre sont préconisés comme « l'option ultime » pour atteindre l'équilibre entre les genres au sein des conseils d'administration lorsque les efforts volontaires pour promouvoir la diversité des genres ont échoué (Grosvold & Brammer, 2011).

Les quotas de genre dans les conseils d'administration sont introduits sous la forme de quotas volontaires ou obligatoires. Les quotas volontaires visent à améliorer progressivement la proportion de femmes membres des conseils d'administration grâce à des changements progressifs sans sanctions. De telles approches ont été mises en œuvre par les Pays-Bas, l'Espagne et l'Autriche. L'intention des quotas volontaires est de créer une vision partagée en incluant les entreprises et les acteurs clés pour œuvrer au changement (Spender, 2012; Klettner et al., 2016). Les partisans de l'approche douce soutiennent que la conformité obligatoire peut conduire à la nomination

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d'administratrices en tant que « membres du conseil remplissant les quotas » sans avoir suffisamment de connaissances et d'expertise, n'apportant ainsi aucune contribution significative au fonctionnement du conseil (Casey, Skibnes, & Pringle, 2011). Au contraire, les opposants aux approches dites « douces » ne sont pas convaincus par l'idée de vitesse de changement, et prétendent que l'obligation forcée est indispensable pour apporter le changement. Ainsi, les réformes obligatoires sont présentées comme l'option « ultime » lorsque les efforts volontaires pour accroître la présence des femmes au sein des conseils deviennent vains (Grosvold & Brammer, 2011). La Norvège a été la pionnière de l'initiative des quotas obligatoires après l'échec de l'approche volontaire en mettant en œuvre un quota obligatoire de genre dans les conseils d'administration de 40 % pour les entreprises cotées en bourse en 2003. Suivant l'exemple norvégien, d'autres pays européens ont également utilisé des approches obligatoires pour mettre en œuvre des quotas de genre dans les conseils d'administration. Avec pour objectifs d'atteindre une diversité de genre dans les conseils d'administration entre 30 et 50 pour cent de femmes membres des conseils d'administration, l'Italie, l'Allemagne et la Belgique ont adopté des quotas de genre obligatoires pour les conseils d'administration des entreprises. Le 20 janvier 2010, Marie Jo Zimmerman a présenté la Proposition de loi no. 2140, à l'Assemblée nationale conformément à la loi sur la parité (pour accroître la proportion de femmes dans les organes élus) et la loi sur l'équité (2006). Le parlement français a adopté la « loi Cope-Zimmerman » en janvier 2011 en obligeant les entreprises françaises à assurer au moins 40 % de femmes administrateurs dans leurs conseils d'administration jusqu'en 2017, ainsi qu'un seuil transitoire de 20 % en 2014.

Des recherches plus récentes évaluent maintenant l'efficacité relative des deux approches et le débat est ouvert dans le domaine de l'économie et de la finance (Adams,



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de Haan, Terjesen, & van Ees, 2015; Terjesen, Aguilera, & Lorenz, 2015). Les recherches existantes ont mis en évidence que les initiatives politiques telles que les quotas de genre au sein des conseils d'administration sont fortement contextualisées et intégrées dans des environnements réglementaires particuliers. De plus, la procédure et l'exigence imposées par la loi affectent également le potentiel de la loi à apporter des changements (Lépinard, 2018; Paxton & Hughes, 2015; Schwindt-Bayer, 2009). Il existe peu de preuves empiriques de divers aspects des quotas des conseils d'administration dans le contexte européen (Hughes et al., 2017; Kirsch, 2018). Les preuves empiriques existantes sur les quotas de genre dans les conseils d'administration sont principalement basées sur l'expérience norvégienne, alors que certains chercheurs ont examiné cette question des quotas de genre dans les conseils d'administration dans le contexte d'autres pays européens (par exemple, Ahern & Dittmar, 2012; Bøhren & Staubo, 2014; Comi et al., 2019; Eckbo, Nygaard & Thorburn, 2016; Lucas-Pérez et al., 2015; Matsa & Miller, 2013; Nygaard, 2011; Reguera-Alvarado et al., 2017; Sabatier, 2015). Les études examinant l'impact de la législation sur les quotas de genre sur la performance des entreprises donnent des résultats mitigés dans différents pays. Ahern et Dittmar (2012), Matsa et Miller (2013) et Voß (2015) documentent un impact négatif de la législation obligatoire de genre sur la performance du marché des entreprises norvégiennes. Contrairement à la Norvège, Ferrari et al. (2018) trouvent un impact positif de la législation obligatoire sur l'égalité des genres dans les conseils d'administration sur la performance de l'entreprise mesurée en tant que rendements boursiers en Italie. En Espagne, des résultats positifs de la diversité des genres au sein du conseil d'administration (renforcés par des réformes douces des quotas) et des performances économiques sont également signalés (Reguera-Alvarado et al., 2017; Lucas-Pérez et al., 2015). Des études initiales dans le contexte français rapportent des

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résultats contradictoires de la législation obligatoire sur les quotas de genre dans les conseils d'administration. Par exemple, Sabatier (2015) rapporte un impact positif et Comi et al. (2019) rapportent l'impact négatif de la législation sur les quotas obligatoires sur la performance des entreprises.

Ces études sont basées sur différents échantillons (par exemple, Sabatier (2015) utilise des sociétés cotées au CAC 40) et sur une période allant jusqu'en 2014. Depuis que la législation obligatoire sur les quotas de genre dans les conseils d'administration a été pleinement adoptée en France en 2017, aucune étude n'a été menée pour analyser l'impact de l'augmentation de la proportion de femmes administrateurs dans la performance de l'entreprise. Dans cette piste, cette thèse tente d'élargir notre compréhension de la façon dont la promulgation d'une législation obligatoire sur les quotas de genre dans les conseils d'administration affecte la performance de l'entreprise dans le contexte français.

### *Objectifs*

L'objectif principal de cette thèse est d'examiner l'effet de la mise en œuvre de la loi Cope-Zimmerman sur la performance des entreprises françaises. Pour atteindre cet objectif, nous étudions l'impact de la présence des femmes au conseil d'administration sur le marché ainsi que sur les mesures financières de la performance des entreprises (ROA et Q de Tobin) en utilisant un échantillon d'entreprises françaises cotées dans l'indice SBF 120 sur une période allant de 2001 à 2019 inclus. En ce qui concerne la réforme obligatoire des quotas de genre dans les conseils d'administration, il existe peu de preuves empiriques explorant le lien entre la législation relative aux quotas de genre et la performance des entreprises dans le contexte français. À cet égard, le deuxième objectif de notre étude est d'étudier l'impact de la législation relative aux quotas obligatoires de genre et la performance financière des entreprises, ainsi que

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l'efficacité de la réforme obligatoire (c'est-à-dire si le pourcentage obligatoire est atteint ou non). De plus, des recherches antérieures n'ont pas examiné comment les politiques de diversité des genres affectent le fonctionnement interne du conseil. De même, les récentes pressions réglementaires et institutionnelles se concentrent sur la nomination de femmes au conseil, mais ces mesures ne tiennent pas en compte la nomination des femmes aux mécanismes de gouvernance. De plus, à la lumière des preuves de double plafond de verre et de ségrégation positionnelle (Nekhili & Gatfaoui, 2013; Reberioux & Roudaut, 2016), le troisième objectif de cette étude est d'enquêter sur les postes attribués aux femmes administrateurs dans les conseils d'administration tels que l'appartenance aux comités d'audit et leur nomination en tant qu'administrateurs indépendants. Nous visons à étudier séparément leur impact sur la performance comptable et boursière. Enfin, en tenant compte de la peur potentielle de la multi-direction associée à l'approche législative ou à la nomination de femmes non qualifiées en raison de la pénurie de femmes qualifiées (Adams & Kirchmaier, 2015) et de l'émergence de «Golden Skirts» (peu de membres du conseil d'administration) en Norvège (Seierstad & Opsahl, 2011) le quatrième objectif de notre étude est d'examiner les attributs (nationalité, éducation, expérience et mandat) des femmes administrateurs et leur impact sur la performance.

### *Méthodologie*

Nous avons développé notre échantillon en prenant toutes les entreprises non-financières de l'indice SBF120 cotées sur Euronext Paris pour la période comprise entre 2001 et 2019. Nous récupérons les informations financières et comptables de nos entreprises de l'échantillon auprès de Thomson DataStream. Nous collectons manuellement toutes les informations concernant le conseil d'administration (nombre d'administrateurs, la composition de leurs comités, l'indépendance, la fréquence des

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réunions) et les attributs des femmes administrateurs (par exemple, expérience, nationalité, multi-direction et mandat) du document de référence de l'échantillon. Nous avons utilisé les documents d'enregistrement du site Web de l'Autorité des marchés financiers (Autorité des marchés financiers) et du site Web officiel de chaque société échantillon. Afin de compléter les informations manquantes, nous avons également utilisé des sources d'informations virtuelles telles que [www.dirigeant.societe.com](http://www.dirigeant.societe.com) et le réseau social professionnel [www.linkedin.com](http://www.linkedin.com).

Afin d'étudier l'impact de la diversité du genre dans les conseils d'administration (notre variable d'intérêt) sur la performance de l'entreprise (notre variable dépendante), nous suivons des recherches antérieures sur la diversité du genre dans les conseils d'administration pour choisir les mesures appropriées (par exemple, Campbell & Mínguez-Vera, 2008 Gordini & Rancati, 2017; Nekhili et al., 2020). Nous utilisons quatre mesures différentes pour notre variable d'intérêt. Précisément, nous avons utilisé le nombre d'administratrices, la proportion d'administratrices, l'indice Blau de diversité du genre et l'indice de Shannon de diversité du genre. En ce qui concerne notre variable dépendante, nous utilisons des mesures comptables et du marché qui sont couramment utilisées dans la littérature antérieure (c.-à-d. Le taux de rentabilité économique (ROA) et le q de Tobin). Les variables de contrôle susceptibles d'influencer la relation entre la diversité du genre au sein du conseil d'administration et la performance de l'entreprise sont également intégrées dans le modèle de régression. Les variables de contrôle sont regroupées en trois catégories. La première catégorie est associée aux attributs de la taille, de l'indépendance et du nombre de réunions des conseils d'administration (comités d'audit). La deuxième catégorie contrôle l'effet du leadership d'entreprise, comme la dualité PDG / Président, la présence d'une femme PDG. Enfin, la structure de propriété est contrôlée en utilisant la propriété familiale et la propriété institutionnelle.

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Nous utilisons également des variables de contrôle pour saisir le niveau de risque de l'entreprise, sa croissance et sa taille. De plus, des variables indicatrices d'industrie et d'année sont également incluses pour contrôler les effets causés par la variation du temps et de l'industrie.

La littérature existante a identifié, tout en examinant la question de la diversité du genre dans les conseils d'administration et sa relation avec la performance de l'entreprise, les chercheurs devraient examiner attentivement la question de l'endogénéité (Adams, 2016; Adams & Ferreira, 2009). Par exemple, une étude récente menée par Eckbo et al. (2016) confirme la validité des résultats négatifs d'Ahern et Dittmar (2012) en ce qui concerne l'efficacité de la législation relative aux quotas de genre et illustre que la réaction inverse du marché est devenue non significative en utilisant une analyse plus robuste qui traite de manière appropriée le problème de l'endogénéité. Bien que les sociétés de conseil présentent un argument de «business case» en faveur de la diversité du genre (par exemple, Catalyst, 2007; Mckinsey, 2007), les chercheurs hésitent à se fier aux résultats car ils ne tiennent pas compte des problèmes d'endogénéité (Adams, 2016). Le problème de l'endogénéité peut survenir en raison de divers facteurs tels que le problème de sélection, l'hétérogénéité non observable, la simultanéité ou l'erreur de mesure. Afin d'atténuer le problème de l'endogénéité, nous contrôlons d'abord le biais de sélection en effectuant un appariement du score de propension entre les entreprises avec une proportion supérieure à la médiane de femmes administrateurs et les entreprises avec une proportion inférieure à la médiane de femmes administrateurs (Rosenbaum & Rubin, 1983). Deuxièmement, nous avons appliqué la technique d'estimation par système GMM (méthode généralisée des moments) comme approche principale d'estimation pour traiter le problème de l'endogénéité provenant de différentes sources (Blundell &

Bond, 1998). Cette méthodologie permet d'obtenir des résultats cohérents et évite les biais résultant des problèmes d'endogénéité (Flannery & Hankins, 2013; Roodman, 2009; Wintoki et al., 2012). De plus, nous avons également utilisé l'approche de la différence des différences pour examiner l'impact marginal de la diversité du genre dans les conseils d'administration sur la performance de l'entreprise au cours de la période post-quota.

### *Résultats*

Le parlement français a promulgué la «loi Cope-Zimmerman» en 2011 pour assurer au moins 40% de femmes dans les conseils d'administration des sociétés françaises d'ici 2017. Cette thèse vise à mettre l'accent sur le respect de cette loi par les entreprises cotées françaises et à enquêter sur ses effets sur la performance comptable et boursière (mesurée par le ROA et le Q de Tobin, respectivement). Notre échantillon est composé d'entreprises non financières cotées sur l'indice SBF 120 durant la période allant de 2001 à 2019. Pour contrer de manière appropriée le problème d'endogénéité, nous utilisons l'approche du Propensity Score Matching (PSM) et le système de régression GMM. Nous montrons tout d'abord que les entreprises françaises ont atteint le niveau souhaité de femmes administrateurs (soit 40%). Tout en examinant la tendance de la présence des femmes administrateurs, nous constatons que les entreprises françaises ont tendance à nommer plus de femmes administrateurs aux postes susceptibles d'exercer une fonction de contrôle (c.-à-d. Membre indépendant du conseil d'administration et membre du comité d'audit) par rapport aux femmes administrateurs internes. Les analyses multivariées montrent que la diversité du genre dans les conseils d'administration affecte positivement le ROA, alors qu'elle affecte négativement le Q de Tobin. Plus important encore, nous utilisons l'approche de la différence des différences pour examiner les effets marginaux de la loi Cope-

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Zimmerman. Dans la période post-quota, le lien entre la proportion des femmes administrateurs et le ROA devient encore plus fort, tandis que le coefficient négatif trouvé pour le Q de Tobin devient positif. En outre, notre étude révèle que les femmes occupant des postes de surveillance améliorent à la fois le ROA et le Q de Tobin. Cependant, la présence des femmes administrateurs internes réduit la rentabilité de l'entreprise et cette relation est même renforcée après la promulgation du quota. Enfin, nous effectuons une analyse supplémentaire en incluant les attributs des femmes administratrices dans notre modèle de régression et montrons que nos résultats restent inchangés. Dans l'ensemble, les résultats présentés dans cette thèse suggèrent que la législation sur les quotas obligatoires de genre a réussi à briser le plafond de verre et la ségrégation entre les genres en allant au-delà de la présence symbolique de femmes dans le contexte français. Ces conclusions font actuellement débat sur la législation sur les quotas obligatoires de genre dans les conseils d'administration en montrant que, dans le but d'améliorer la diversité de genre dans les conseils d'administration, des femmes administrateurs devraient être nommées à des postes clés au sein du conseil pour pouvoir contribuer plus efficacement à l'amélioration de la performance.

### *Contribution*

Cette thèse contribue à la littérature sur la gouvernance d'entreprise, en particulier le domaine émergent de la littérature qui se concentre sur les réformes de genre obligatoires des conseils d'administration affectant la composition des conseils d'administration. Cette thèse explore empiriquement l'effet modérateur de la législation sur les quotas obligatoires de genre sur la relation entre la proportion des femmes administrateurs et la performance des entreprises dans le contexte français. La majorité des études empiriques existantes sur le lien entre la performance de l'entreprise et les réformes relative à la diversité du genre dans les conseils d'administration sont réalisées

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dans le contexte norvégien (Ahern & Dittmar, 2012; Böhren & Staubo, 2014; Dale-Olsen et al., 2013; Eckbo et al., 2016; Matsa & Miller, 2013; Nygaard, 2011; Voß, 2015).

Alors que quelques recherches universitaires étudient également l'effet de ces réformes sur la performance des entreprises dans d'autres juridictions telles que le Royaume-Uni, l'Italie, la Suède et l'Espagne (Brahma et al., 2021; Comi, Grasseni, Origo, & Pagani, 2020; Ferrari, Ferraro, Profeta, & Pronzato, 2018; Labelle, Francoeur, & Lakhali, 2015; Reguera-Alvarado, De Fuentes, & Laffarga, 2017; Reddy & Jadhav, 2019), les résultats de ces études suggèrent que le quota obligatoire de genre dans les conseils d'administration a eu un impact négatif sur la valeur boursière des entreprises norvégiennes (Ahern & Dittmar, 2012; Matsa & Miller, 2013; Voß, 2015). En revanche, l'effet positif des réformes obligatoires de l'égalité des genre dans les conseils d'administration sur la performance (mesuré par les rendements boursiers) des entreprises italiennes cotées est rapporté par Ferrari et al. (2018). Seules deux études ont examiné l'impact de la loi sur les quotas de genre sur la performance des entreprises dans le contexte français.

Dans un premier temps, Sabatier (2015) a examiné l'impact des réformes de la diversité de genre sur un échantillon d'entreprises françaises cotées au CAC40 de 2008 à 2014 et présente un impact positif des réformes de la diversité sur la performance des entreprises. Deuxièmement, Comi et al. (2019) utilisent un ensemble de données de 2004 à 2014 et rapportent un effet négatif des réformes de la diversité de genre sur la performance des entreprises françaises. À notre connaissance, après la promulgation de la loi «Cope-Zimmerman», aucune autre étude n'a examiné empiriquement l'effet de la législation sur les quotas obligatoires de genre et la performance des entreprises dans le contexte français. À cet égard, la thèse actuelle est la première tentative pour mettre



l'accent sur le respect de cette loi par les sociétés cotées françaises et d'étudier l'effet sur leurs performances comptables et du marché (ROA et Q de Tobin).

À partir d'un échantillon d'entreprises françaises de l'indice SBF 120 sur la période allant de 2001 à 2019, les résultats empiriques présentés dans cette thèse complètent les résultats trouvés de Sabatier (2015) en démontrant un impact positif de la législation obligatoire relative aux quotas de genre dans les conseils d'administration sur la performance des entreprises. En outre, notre étude contribue également à la littérature en démontrant que l'effet de la participation des femmes au conseil d'administration sur la performance de l'entreprise est affecté par la position attribuée aux femmes administrateurs dans le conseil.

Nous élargissons également la littérature actuelle en allant au-delà des effets économiques de la législation sur les quotas obligatoires de genre et en explorant le poste assigné aux femmes dans la période post-quota. Notre enquête révèle qu'il y a une tendance croissante à nommer des femmes administrateurs aux postes clés de contrôle des conseils d'administration français (en tant que membres du comité d'audit et administrateurs indépendants) depuis la promulgation de la législation sur les quotas de genre. En outre, nous signalons une tendance à la baisse de la nomination de femmes administrateurs internes. Ces résultats suggèrent que la législation obligatoire sur les quotas de genre semble réussir à briser le double plafond de verre et la ségrégation positionnelle (Nekhili & Gatfaoui, 2013; Reberioux & Roudaut, 2016) pour les femmes administrateurs en France et réfutent les préoccupations concernant la nomination symbolique de femmes administrateurs (Choudhury, 2015; Smith, 2018). Enfin, notre thèse répond à la question de recherche relative aux attributs des femmes administrateurs nommées à la suite de l'urgence provoquée par la législation sur les quotas de genre obligatoire. Précisément, nous contribuons à la littérature en mettant en

lumière la variation d'une année sur l'autre des attributs des femmes au conseil d'administration (c'est-à-dire, éducation, nationalité, multi-direction, expérience et mandat) suivant la législation sur les quotas de genre. Nous montrons également que le lien entre la diversité de genre au sein du conseil et la performance de l'entreprise reste inchangé même après avoir contrôlé par les attributs des femmes administrateurs.

### *Implication*

Du point de vue politique, le quota de genre dans les conseils d'administration français semble clairement être un succès dans la mesure où la nomination d'administratrices dans les conseils d'administration affecte positivement les performances comptables et de marché des entreprises françaises. D'un point de vue opérationnel, le succès du quota de genre obligatoire français dans les conseils d'administration est démontré par l'intégration des femmes membres du conseil d'administration dans les mécanismes de gouvernance (Guo & Masulis, 2015; Green & Homroy, 2017). Par conséquent, les femmes administrateurs peuvent contribuer positivement à l'efficacité du conseil en affirmant leur capacité de contrôle, tout en diminuant le besoin d'assurance formulé par les auditeurs externes et en réduisant les coûts d'agence. En outre, comme les conclusions de cette thèse démontrent que les entreprises françaises ont commencé à nommer des femmes administrateurs à des postes importants de surveillance de leurs conseils d'administration (par exemple, en tant que membres indépendants du conseil et membres du comité d'audit) dans la période post-quota, le phénomène plafond semble être rompu en France (Nekhili & Gatfaoui, 2013; Reberieux & Roudaut, 2016). À la lumière de nos résultats, il est clair que les résultats positifs des quotas de genre dans les conseils d'administration dépendent de l'intégration des femmes administrateurs dans les mécanismes de gouvernance plutôt que de la simple représentation de femmes administrateurs dans les

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conseils d'administration. Les résultats empiriques de cette thèse peuvent aider les décideurs politiques de nombreux pays qui ont imposé ou sont en train d'imposer des réformes des quotas de genre au conseil d'administration. Par conséquent, donner aux femmes administrateurs l'accès au processus de prise de décision aux échelons supérieurs des conseils d'administration devrait être l'intérêt spécifique des régulateurs, des praticiens et des parties prenantes de l'entreprise plutôt que d'imposer un quota de genre uniquement à des fins de représentation.

### *Limitation et orientation pour les études futures*

Comme d'autres études, cette thèse comporte également des limites. Tout d'abord, nous examinons l'impact de la loi sur les quotas obligatoires de genre dans les conseils d'administration sur la performance comptable et boursière des sociétés cotées françaises. Ce serait également une piste intéressante pour étudier l'effet marginal de l'augmentation de la proportion de femmes administrateurs sur les dimensions sociales et éthiques des entreprises françaises telles que la qualité des états financiers, la gestion des revenus et la responsabilité sociale des entreprises. Deuxièmement, même si nous montrons que les entreprises françaises ont non seulement respecté la législation obligatoire sur les quotas de genre en nommant 40% de femmes administrateurs dans leurs conseils d'administration, mais les ont également nommées à des postes clés de surveillance dans les conseils. Des études futures pourraient explorer si les femmes au conseil d'administration ont atteint des postes de direction tels que PDG et présidente du conseil. Troisièmement, la relation entre la diversité du genre au sein du conseil et la performance de l'entreprise est sujet au problème de l'endogénéité. Afin d'atténuer les problèmes d'endogénéité et de confirmer la robustesse de nos résultats empiriques, nous avons utilisé le système GMM et la technique de la différence des différences. Nous craignons toujours que les problèmes d'endogénéité ne puissent être écartés avec une

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certitude totale. Quatrièmement, cette thèse se concentre sur le poste assigné aux femmes administrateurs au conseil et leurs attributs, le processus de sélection de la nomination des femmes administrateurs dans la législation post-quota est également un sujet intéressant à explorer. Cinquièmement, notre étude a examiné l'impact de la législation obligatoire sur les quotas de genre. La littérature démontre que différents facteurs institutionnels propres à chaque pays jouent un rôle important dans l'introduction de réformes de la diversité de genre dans les conseils d'administration (Grosvold et al., 2016). Enfin, une limitation inhérente à cette étude est que nous considérons un échantillon de sociétés françaises cotées sur l'indice SBF120 dans notre analyse. Les études futures pourront s'étendre à un échantillon de toutes les sociétés cotées françaises pour étudier la variation de conformité du quota obligatoire de genre au conseil d'administration entre entreprises françaises de différentes tailles.

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## Appendices

### Appendix 1

#### European Legislative and Voluntary Initiatives for Gender Diversity in the Board of Directors

Country	Legislative measures applicable to	Type of legislation	Sanctions	Voluntary initiatives
Austria	Companies owned by the State.	Austria introduced a voluntary legislation to have 25% females on corporate boards by 2011 and 35% by 2013.	Without sanction	Board gender diversity is enhanced through recommendations in codes of corporate governance.
Belgium	Companies owned by the State.	Belgium introduced a voluntary legislation to have one third females on corporate board by 2012 for large companies owned by the state and have one third females on board by 2019 for small companies.	With sanction	Board gender diversity is enhanced through recommendations in codes of corporate governance.
Denmark	Large companies owned by the State	Denmark encourages the companies owned by the state to have gender balanced boards by the introduction of voluntary targets.	Without sanction	Board gender diversity is enhanced through recommendations in codes of corporate governance.
Finland	Companies owned by the State	Finland encourages the companies owned by the state to have gender balanced boards by introducing voluntary targets.	Without sanction	Board gender diversity is enhanced through recommendations in codes of corporate governance and government equality policy.
France	Companies owned by the State and other large companies.	In France, mandatory board gender quota was introduced in 2011 to achieve 20% female directors by 2014 and 40 % by 2017. This law is applicable to both listed and unlisted companies employing at least 500 workers. \	With sanction	Board gender diversity is also enhanced through recommendations in codes of corporate governance.
Germany	Companies owned by the State	In 2013, Germany introduced voluntary quotas of 30% female directors on board by 2020.	Without sanction	Board gender diversity is enhanced through recommendations in codes of corporate governance.
Greece	Companies owned by the State	One-third of state appointees to boards of state-owned companies must be from each sex.	Without sanction	Board gender diversity is enhanced through voluntary targets and in response DAX 30 companies also incorporate these targets in their governance codes in

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				2011.
Ireland	Companies owned by the State	Voluntary targets are set by the government for board gender diversity.	Without sanctions	Voluntary
Italy	companies owned by State	The Italian government passed a mandatory law of 33% female directors by 2015 backed by penalties for listed companies.	With sanctions	Board gender diversity is also enhanced through codes of corporate governance.
Netherlands	Large listed companies	Voluntary board gender quota law was passed in 2011 that require all listed to have 30% of each gender on board.	Without sanctions	Board gender diversity is enhanced through codes of corporate governance.
Norway	All companies	The Norwegian government passed a mandatory law in 2006 to ensure 40%female directors on board.	With sanctions	Board gender diversity is enhanced through codes of corporate governance.
Portugal	Companies owned by the State	The Portuguese government passed a legislation in 2012 that requires state companies to ensure gender equality on boards of directors.	Without sanctions	Government proposes all the listed firms to ensure board gender equality while hiring directors.
Spain	Companies owned by the State	In 2007, Spain passed a voluntary legislation for board gender diversity that requires all public listed firms to ensure a 40% female board of directors by 2015.	Without sanctions	Board gender diversity is enhanced through codes of corporate governance.
Sweden	Listed companies	Voluntary	Without sanctions	Board gender diversity is enhanced through codes of corporate governance.
Switzerland	Listed companies	Voluntary	Without sanctions	The Swiss Business Federation suggests voluntary targets for female directors on the board.
UK	Large listed companies	Voluntary	Without sanctions	Board gender diversity is enhanced through codes of corporate governance. They set a voluntary target of 25% female directors on corporate boards by 2015 for large listed companies. They also encourage small companies to ensure gender diversity on their boards by setting their own targets.

Source: European Commission Gender Equality Newsroom (2013).

## Appendices

### Appendix 2

#### Brief history of Gender Equality Acts and Equality Initiatives in European Countries

Country Name	Brief History of Equality Acts	Equality Initiatives
Norway	<ul style="list-style-type: none"> <li>• In Norway Suffrage act was introduced in 1913.</li> <li>• Equality Act was passed in 1978.</li> </ul>	<ul style="list-style-type: none"> <li>• Liberal Party introduced a 40% voluntary quota for females in 1974.</li> <li>• Social Left introduced a 40% voluntary quota for females in 1975.</li> <li>• Norwegian Labor Party introduced a 50% voluntary quota for females in 1983.</li> <li>• Center Party introduced a 40% voluntary quota for females in 1989.</li> <li>• Christian People's Party introduced a 40% voluntary quota for females in 1989.</li> </ul>
Spain	<ul style="list-style-type: none"> <li>• In Spain, Suffrage act was introduced in 1931.</li> <li>• Equality Act was passed in 2007.</li> </ul>	<ul style="list-style-type: none"> <li>• Spanish Socialist Worker's Party introduced quota for female in 1988.</li> <li>• United Left introduced a 40% quota for females in 1987.</li> <li>• Four Regional Parties introduced 40% quota for females in 1991.</li> </ul>
Iceland	<ul style="list-style-type: none"> <li>• In Iceland, Suffrage act was introduced in 1915.</li> <li>• Equality Act was passed in 1976.</li> </ul>	<ul style="list-style-type: none"> <li>• In Iceland, legislative quotas were introduced in 2007 on a voluntary basis.</li> <li>• Social Democratic Alliance introduced 40% female quotas on a voluntary basis in 1999.</li> <li>• Progressive Party introduced 50% female quotas in 1999.</li> </ul>
France	<ul style="list-style-type: none"> <li>• In France, Suffrage act was introduced in 1944.</li> <li>• Equality Act was introduced in 1946 in the constitution.</li> </ul>	<ul style="list-style-type: none"> <li>• In France, a 50% quota for females was introduced in the electoral list in 2000.</li> <li>• Voluntary quotas for females were introduced to increase female representation.</li> </ul>
Italy	<ul style="list-style-type: none"> <li>• In Italy, Suffrage act was introduced in 1945.</li> <li>• The Italian government introduced code for equal opportunities in 2006.</li> </ul>	<ul style="list-style-type: none"> <li>• Labor party introduced a 50% voluntary quota for females in 1990.</li> <li>• Democratic party introduced a 50% legislative quotas for females at sub national level</li> </ul>
Belgium	<ul style="list-style-type: none"> <li>• In Belgium, Suffrage act was introduced in 1919.</li> <li>• The Belgian government passed equality Act in 2007.</li> </ul>	<ul style="list-style-type: none"> <li>• Belgium introduced Legislative quotas for females in 1994 at the single/lower house, The Upper House and at sub national level.</li> </ul>
Netherlands	<ul style="list-style-type: none"> <li>• In the Netherlands, Suffrage act was introduced in 1919.</li> <li>• The act of equal treatment for women and men was introduced in 1980.</li> </ul>	<ul style="list-style-type: none"> <li>• Labor Party introduced quotas for females in 1986.</li> <li>• Voluntary quotas were also introduced to increase female representation.</li> </ul>
Portugal	<ul style="list-style-type: none"> <li>• In Portugal, Suffrage act was introduced in 1919.</li> <li>• The act for Gender Equality was passed in 1979.</li> </ul>	<ul style="list-style-type: none"> <li>• Portugal introduced Legislative quotas for females at the single/lower house and at sub national level.</li> </ul>
Germany	<ul style="list-style-type: none"> <li>• In Germany, Suffrage act was introduced in 1918.</li> <li>• The act for gender equality was passed in 2006.</li> </ul>	<ul style="list-style-type: none"> <li>• In Germany voluntary quota for political parties was introduced. In this respect, Social Democratic Party introduced a 40% female quota in 1988.</li> <li>• The Greens introduced a 50% quota for females in 1986.</li> </ul>

## Appendices

		<ul style="list-style-type: none"><li>• Christian Democratic Union introduced 33.3% quotas in 1996.</li></ul>
Austria	<ul style="list-style-type: none"><li>• In Austria, Suffrage act was introduced in 1919.</li><li>• The act for gender equality was passed in 2004.</li></ul>	<ul style="list-style-type: none"><li>• The Austrian Peoples Party introduced a 33% quota for females in 1995 and Social Democratic Party introduced a 40% quota for females in 1985.</li></ul>

Sources: European Equality Law Network (<https://www.equalitylaw.eu>); International Institute for Democracy and Electoral Assistance: Gender Quotas Database ([www.idea.in](http://www.idea.in); [www.quotaproject.org](http://www.quotaproject.org)).



**Titre :** La diversité du genre aux conseils d'administration et la performance d'entreprise: L'effet de la loi sur les quotas de genre

**Mots clés :** diversité du genre dans les conseils d'administration; loi sur les quotas de genre; performance des entreprises.

**Résumé :** Le parlement français a promulgué la «loi Cope-Zimmerman» en 2011 pour assurer au moins 40% de femmes dans les conseils d'administration des sociétés françaises d'ici 2017. Cette thèse vise à mettre l'accent sur le respect de cette loi par les entreprises cotées françaises et à enquêter sur ses effets sur la performance comptable et boursière (mesurée par le ROA et le Q de Tobin, respectivement). Notre échantillon est composé d'entreprises non financières cotées appartenant à l'indice SBF 120 sur la période allant de 2001 à 2019. Pour appréhender de manière appropriée le problème d'endogénéité, nous utilisons l'approche du Propensity Score Matching (PSM) et le système de régression GMM.

L'examen de la représentation féminine dans les conseils d'administration montre que les entreprises françaises ont tendance à nommer plus de femmes administrateurs aux postes susceptibles d'exercer d'une manière efficace une fonction de contrôle des dirigeants (c.-à-d. Membre indépendant du conseil d'administration et membre du comité d'audit) par rapport aux femmes administrateurs internes. Les analyses multivariées montrent que la diversité du genre dans les conseils d'administration affecte positivement le ROA, alors qu'elle affecte négativement le Q de Tobin. Plus important encore, nous utilisons l'approche de la différence des différences pour examiner

les effets marginaux de la loi Cope-Zimmerman. Dans la période post-quota, le lien entre la proportion des femmes au CA et le ROA devient encore plus fort, tandis que le coefficient négatif du Q de Tobin devient positif. En outre, notre étude révèle que les femmes occupant des postes de surveillance améliorent à la fois le ROA et le Q de Tobin. Cependant, les femmes administrateurs internes réduisent la rentabilité de l'entreprise et cette relation est même renforcée après la période de quota. Enfin, nous effectuons une analyse supplémentaire en incluant les attributs des femmes administratrices dans notre modèle de régression et montrons que nos résultats restent inchangés.

Dans l'ensemble, les résultats présentés dans cette thèse suggèrent que la législation sur les quotas obligatoires de genre a réussi à briser le plafond de verre et la ségrégation entre les genres en allant au-delà de la présence symbolique de femmes dans le contexte français. Ces conclusions font actuellement débat sur la législation sur les quotas obligatoires de genre dans les conseils d'administration en montrant que, dans le but d'améliorer la diversité de genre dans les conseils d'administration, des femmes administrateurs devraient être nommées à des postes clés au sein du conseil afin de pouvoir exercer une influence significative sur la performance des entreprises.

**Title :** Gender diverse boards and firm performance: The effect of gender quota law

**Keywords:** board gender diversity, gender quota law, firm performance.

**Abstract:** Policy-makers around the world are introducing board gender quotas to push female board directorship. The French parliament also enacted "Cope-Zimmerman Law" in 2011 to ensure at least 40% female board members on French corporate boards by 2017. This dissertation aims to shed light on the compliance of this law by French listed firms and to investigate its effect on their accounting and market-based performance (i.e. ROA and Tobin's Q, respectively). We draw our sample by taking all non-financial firms listed on SBF 120 index from 2001 to 2019. To appropriately counter the problem of endogeneity, we use Propensity Score Matching (PSM) approach and system GMM regression.

We first show that French firms have achieved 40% female directorship. The multivariate analyses show that board gender diversity positively affect ROA, whereas it negatively affect Tobin's Q. More importantly, we use difference-in-differences approach to examine the marginal effects of the

Cope-Zimmerman law. In the post-quota period, the link between the female directorship and ROA becomes stronger, whereas the negative coefficient on Tobin's Q turns positive. Further, we find that female directors on monitoring positions improve both ROA and Tobin's Q. However, female inside directors reduce firm profitability and this relationship is even strengthened in the post-quota period.

The findings presented in this dissertation suggest that mandatory gender quota legislation has been successful in breaking the glass ceiling and positional gender segregation by going beyond token presence of female directors in French context. These findings refute the occurrence of golden skirt phenomenon and/or multi-directorship in the aftermath of mandatory gender quota legislation. These findings adds to current debate on mandatory board gender quota legislation by showing that in pursuit of enhancing board gender diversity, female directors should be appointed on key board positions to benefit corporate stakeholders.