

# OWNERSHIP STRUCTURE AND WOMEN ON BOARDS OF DIRECTORS OF CANADIAN LISTED COMPANIES

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## Abstract

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This study examines how the structure of shareholder ownership (i.e., management, external blockholders, and board ownership) affects the presence of women on boards of directors. The results of an analysis of a sample of listed Canadian companies for the period 2007-2015, controlling for endogeneity, indicate that the proportion of women sitting on a firm's board of directors is influenced by its shareholding structure, thus, supporting the view that the two governance mechanisms of gender diversity and shareholder structure can substitute for each other. The results also show that there is a curvilinear relationship between a company's ownership structure and the proportion of women on its board of directors and audit committee. Indeed, findings show that as the concentration of company ownership increases, the proportion of women on boards of directors decreases to a threshold, following which we observe an increase in the proportion of women sitting on boards of directors and particularly on audit committees.

**Keywords:** Ownership Structure, Women, Board of Directors Composition, Substitution Effect, Board Committees

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## 1. INTRODUCTION

Women are important stakeholders in companies where they act as owners or employees; they also perform many other functions that are essential to the well-being of a company. However, the presence of women in senior management is still very low compared to that of men (Geiger & Marlin, 2012).

Several studies (Adams & Ferreira, 2009; Bart & McQueen, 2013; Bear, Rahman, & Post, 2010; Catalyst, 2015; Geiger & Marlin, 2012; Zaichkowsky, 2014) highlight the under-representation of women on the boards of directors of large companies. For example, in Canada, women hold only 20.8% of board seats in companies listed on the TSX 60 index (Catalyst, 2015). The finding is more worrying

among Canadian companies not listed on the TSX 60 and also among the 500 largest companies in Canada, where respectively only 17.1% and 12.3% of board members are women. Yet, gender diversity in senior management helps improve the quality of business management (Bear et al., 2010; Zaichkowsky, 2014).

Some studies examine the impact of the presence of women on boards of directors on firms' financial and accounting performance (Campbell & Minguez-Vera, 2008; Nguyen & Faff, 2007) and find contradictory results. However, based on an analysis of 140 studies, Post and Byron (2015) conclude that the presence of women on boards of directors positively affects companies' accounting performance. Additionally, Adams and Ferreira (2009) and Zaichkowsky (2014) find gender diversity has a positive influence on the performance of company boards. According to Boone, Field, Karpoff, and Raheja (2007), the effectiveness of a board of directors increases with the presence of women because women assume supervisory roles more effectively than men do and this helps limit agency conflicts. Legislators and regulators in several countries, including Canada, are advocating for the establishment of minimum quotas for women on boards of directors (Zaichkowsky, 2014).

Since the presence of women on boards (Adams & Ferreira, 2009) and companies' ownership structure (Daniels & Morck, 1995; Fraile & Fradejas, 2014; Jensen & Meckling, 1976) improve corporate governance, these two governance mechanisms could complement or replace each other. In this regard, Nekhili and Gatfaoui (2013) found that a company's ownership structure influences whether women are on its board; in particular, they found women are more present on boards of family businesses.

The objective of our study is, thus, to examine the possible existence of a substitution effect (Bozec & Bozec, 2007; Fraile & Fradejas, 2014) between the presence of women on boards and other governance mechanisms that are linked to the shareholding structure of Canadian companies (management, external blockholders, and board ownership). According to the substitution effect argument, different governance methods can either substitute for or complement each other (Bozec & Bozec, 2007; Rediker & Sandh, 1995). For example, when power is concentrated in the hands of shareholders, this leads to better monitoring and reduces the advantage of other corporate governance mechanisms. Concretely, the main goal of this study is to verify whether gender diversity on boards of directors of Canadian firms is influenced by these firms' ownership structures. Thus, unlike Geiger and Marlin (2012) and Hillman, Shropshire, and Cannella (2007), who study the impact of organizational factors on the representation of women on boards of directors, our research takes into account the particularities and needs of corporate boards in regard to their surveillance role in reducing both asymmetric information and agency problems (Boone et al., 2007). It also emphasizes the possible substitution effect between the different governance mechanisms (Rediker & Seth, 1995).

This study examines how companies' ownership structures, in terms of managers, external blockholders, and members of boards, influence

the presence of women on boards of directors in the Canadian context. This study follows up on other studies that look for possible substitution effects between various governance mechanisms (Bozec & Bozec, 2007; Fraile & Fradejas, 2014; Gnan, Montemerlo, & Huse, 2015; Rakestraw, 2020)

The overall results of the analysis carried out on a sample of 242 Canadian companies listed on the Toronto Stock Exchange for the period 2007-2015 (1,246 observations), while controlling for endogeneity (dynamic model), support a curvilinear relationship between firms' ownership structure and the presence of women on these firms' boards of directors (especially if they are on the audit committee). These results support the substitution effect between those two governance mechanisms while also supporting the idea that businesses' specific needs are considered when composing their boards of directors. Our results also seem to imply that the presence of women on audit committees influences governance mechanisms even more than does their mere presence on boards of directors.

The remainder of the article is organized as follows. Section 2 reviews the literature on the links between certain characteristics of boards of directors and the presence of women on boards. The data and the methodology are presented in Section 3. In Section 4, we discuss the results of the research. Section 5 presents the robustness tests we use to validate and consolidate our results. Section 6 discusses the findings. Finally, Section 7 is devoted to our conclusions, contributions, and the implications of this research.

## 2. THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

Traditionally, the participation of managers or directors in companies' capital (Jensen & Meckling, 1976) or the possession of blocks of shares (Kaplan & Minton, 1994) has been put forward as an important governance mechanisms for controlling agency problems. More recently, the presence of women on boards of directors has also been put forward as an effective governance mechanism.

### 2.1. The supervisory role of women on boards

According to Fama and Jensen (1983), a board of directors plays an important role as a mechanism for controlling and monitoring managers. Agency theory also teaches us that the board of directors' independence is essential to ensure that it functions in the best interests of shareholders. In this perspective, women can have an important role to play on boards since gender diversity increases board independence, resulting in a better alignment between the interests of management and shareholders (Carter, Simkins, & Simpson, 2003; Mallette & Fowler, 1992). Several other studies also show that the presence of women on boards of directors limits the extent of the agency problems that occur between shareholders and managers because they are more sensitive to ethical issues in business than men (Beltramini, Peterson, & Kozmetsky, 1984; Jones & Gautschi, 1988; McCabe, Ingram, & Dato-on, 2006; Peterson, Beltramini, & Kozmetsky, 1991). In addition, Cumming, Leung, and Rui (2015) argue that when more women sit on

company boards, accounting frauds decrease (Delgado-Piña, Rodríguez-Ruiz, Rodríguez-Duarte, & Sastre-Castillo, 2020). In addition, Adams and Ferreira (2009) show that the presence of women on boards helps improve their supervisory function by reducing absenteeism at board meetings. The presence of women on boards could thus reinforce other governance mechanisms related to capital structure, if these mechanisms are found to be insufficient, resulting in better company performance and lower risk (Birindelli, Chiappini, & Savioli, 2020; Velte, 2016; Vishwakarma, 2017). In the event that companies' governance mechanisms that are linked to their ownership structure are sufficient to limit agency conflicts, the addition of women on these companies' boards would bring less added value. For this reason, this study verifies whether there is a substitution effect between the presence of women on boards and certain governance mechanisms that are specifically linked to the shareholder structure of companies, namely managerial (subsection 2.2), external blockholder (subsection 2.3), and board member ownership (subsection 2.4).

## 2.2. Managerial ownership, women on boards of directors, and agency conflicts

According to agency theory, companies' ownership structure could reduce agency conflicts and their associated costs. In this regard, Jensen and Meckling (1976) argue that the greater the number of managers holding a significant percentage of their company's shares, the more their interests are aligned with those of the company's shareholders (incentive effect); thus, reducing the agency conflict between these two entities (Daniels & Morck, 1995; Fraile & Fradejas, 2014). In such a context, as the interests of managers and shareholders converge, the supervisory role played by women on boards of directors would become less important. An opposing argument is that when managers own a substantial stake of their company's shares, this can give them enough power and influence to seek their own interests at the expense of those of other shareholders (Fama & Jensen, 1983). Thus, even if the managers' participation in their company's capital can help reduce the agency problem that accrues to a certain extent from a convergence of interests beyond a certain threshold, this participation could be a source of the type of bad management that can include the misallocation of resources or the use of company funds for private benefit, resulting in an entrenchment effect (Fraile & Fradejas, 2014; Peasnell, Pope, & Young, 2003). Since the composition of boards of directors is supposed to take into account companies' specificities and needs (Boone et al., 2007; Coles, Lemmon, & Wang, 2008; Linck, Netter, & Yang, 2008) and since there is a possible substitution effect between the different governance mechanisms (Bozec & Bozec, 2007; Rediker & Seth, 1995), it would be reasonable to expect a negative relationship between managerial ownership and the percentage of women on a company's board, up to a certain threshold and that beyond this managerial shareholding threshold, a positive relationship between the percentage of women on the board and the percentage of managerial ownership would reduce the risk of

a potential agency problem that could occur when managers have too much power. This would be represented by a curvilinear relationship between the presence of women on the board and manager ownership, as in the following hypotheses:

*H1a: There is a curvilinear relationship between managerial ownership - (i) CEO and other, (ii) other corporate management - and the proportion of women on the board of directors.*

## 2.3. External blockholders, presence of women on boards of directors, and agency conflicts

Agency problems are more prominent in companies with dispersed shareholders. Indeed, the existence of many small, non-controlling shareholders allows managers to neglect their mandate to their companies' shareholders and to make decisions in accordance with their own personal interests (Daniels & Morck, 1995). Since shareholders are aware that the high sense of ethics among women can have a positive impact on corporate governance and performance, they should put pressure on boards of directors to select more female directors. However, when a company's shares are held by a small number of investors or if certain investors hold a large number of shares, allowing them to exercise control, it is more difficult for managers to act on their own interests and to disregard those of the shareholders. In these types of companies, it would be less necessary to depend on the increased oversight role of women to compel managers to act in accordance with their mandates since blocks of shareholders would already play this role. There is still a need to be careful, since companies, where shareholding is too concentrated, may experience agency conflicts between their small and dominant shareholders (Shleifer & Vishny, 1997; Villalonga & Amit, 2006). These conflicts occur when dominant shareholders and managers make decisions that are detrimental to small shareholders (Li & McNally, 1999). Small shareholders are also exposed to the risk of expropriation from dominant shareholders (Aluchna & Kaminski, 2017; Jiang, Kim, Nofsinger, & Zhu, 2017; Kim, Kitsabunnarat-Chatjuthamard, & Nofsinger, 2007). This can take the form of a reallocation of profits, the misuse of assets, the sale of departments or parts of a company at below-market prices to companies that are owned by major shareholders, or exorbitant prices being paid to acquire other companies' shareholders own (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000). Small shareholders can be protected against expropriation by dominant shareholders through compliance with the rules of corporate governance (La Porta et al., 2000), reinforcing the independence of boards of directors (Baglioni & Colombo, 2013; Fraile & Fradejas, 2014) and board diversity (Ararat, Aksu, & Cetin, 2015). Thus, increasing the proportion of women on boards of directors could make it possible to improve certain conflicting relationships within companies. In light of the above, it would be reasonable to expect the percentage of women on boards to be lower when the number of block owners on boards of directors is sufficient to directly or indirectly provide oversight of these companies' management teams through the type of board representation that acts as an incentive effect that results in

a convergence of interests (Jensen & Meckling, 1976; Shleifer & Vishny, 1986). However, once a certain level of external blockholder ownership is reached, the percentage of women on boards is expected to increase, indicating to the market that the interests of small shareholders are protected and that large shareholders will not expropriate their shares in what is known as the entrenchment effect (Fraile & Fradejas, 2014; Peasnell et al., 2003). This can be conceptualized by a curvilinear relationship, between the proportion of capital held by block ownership and the percentage of women on boards of directors, hence the following hypothesis is formulated:

*H2a: There is a curvilinear relationship between the percentage of companies' capital held by blocks of external shareholders and the proportion of women on boards of directors.*

## 2.4. Boards of directors, women's presence on boards, and agency conflicts

Even though the role of a board of directors is to monitor managers and reduce both asymmetric information and agency issues, board members often act relatively passively in their oversight role (Hermalin & Weisbach, 1998; Ng, 2007). Several studies address the various characteristics that would make it possible for boards to improve their performance (Adams & Ferreira, 2009; Fraile & Fradejas, 2014; Jensen & Meckling, 1976; Tulung & Ramdani, 2018; Uribe-Bohorquez, Martínez-Ferrero, & García-Sánchez, 2018; Zaichkowsky, 2014). As we have already indicated, research suggests that, among other things, women's presence is a mechanism that improves board performance (Adams & Ferreira, 2009; Zaichkowsky, 2014). Other research also looks at board members' share ownership in their assessments of board performance, using companies' financial performance as a measure. Based on the argument of Jensen and Meckling (1976), one should observe an improvement in the performance of a company's board when board members are also shareholders. Morck, Shleifer, and Vishny (1988) corroborate this when they find that companies' performance improves when the volume of shares held by board members increases (but remains under a certain threshold). Other research finds similar results using companies' events. For example, in the context of a takeover, Cosh, Guest, and Hughes (2006) show that long-term stock market returns are positively related to the shareholdings of members of boards of directors, whereas Howton, Howton, and Olson (2001) show that the level of board ownership is significantly related to first-day IPO returns. As is the case for management and blockholder ownership, care must be taken in terms of directors' share ownership. If it is too high, it can have a negative effect on board performance (entrenchment effect). In this regard, researchers suggest that the relationship between share ownership by board members and board performance is non-linear, meaning that as the percentage of board member ownership increases, board performance initially increases and then decreases, supporting the concept of a curvilinear relationship between these two factors (McConnell & Servaes, 1990; Morck et al., 1988). Likewise, we believe that there is

a curvilinear relationship between the presence of women on a board and the holding of shares by blocks of board shareholders. According to this hypothesis, the presence of women would be more desirable when the percentage of shares held by blockholders is insufficient to limit agency conflicts or when their ownership exceeds a certain critical threshold, thereby encouraging the expropriation of small shareholders. Hence, the following hypothesis is formulated:

*H3a: There is a curvilinear relationship between the percentage share ownership by members of companies' boards of directors and the proportion of women on these companies' boards.*

Finally, the relationship between board performance and companies' ownership structure becomes more complex since there is undeniably a problem of endogeneity between these two variables. Indeed, authors such as Davidson and Rowe (2004) put forward this argument to justify their lack of conclusive results. In this regard, our econometric model controls for this endogeneity problem.

## 2.5. Shareholder structure and presence of women on board committees

The presence of women on boards improves board performance in terms of these boards' oversight role and, thereby, reduces the asymmetry of information and the agency problems that occur between managers and shareholders. Some authors argue that the presence of women on various board committees would be even more beneficial than their mere presence on boards, given that many of these committees perform important tasks (Green & HomRoy, 2017; Guo & Masulis, 2015; Lee, 2020). In Canada, audit, nominating, and compensation committees are the most prominent as they are generally mandated to do extensive work for their boards. It can therefore be assumed that the directors who sit on these committees have more influence over board decisions (Adams & Ferreira, 2009). Note that we can expect more significant results for the presence of women on various board committees given that there is less external pressure to nominate women to these committees than to nominate them to the board of directors (Knippen, Shen, & Zhu, 2019). In view of the above, we reformulate hypotheses *H1a*, *H2a*, and *H3a* to consider the presence of women on various board committees, and hypotheses *H1b* to *H1d*, *H2b* to *H2d*, and *H3b* to *H3d* are formulated as follows.

*H1b, H1c, and H1d: There is a curvilinear relationship between the percentage of companies' capital held by management [(i) CEO and (ii) other corporate management] and the proportion of women sitting on b) nomination, c) remuneration, and d) audit committees.*

*H2b, H2c, and H2d: There is a curvilinear relationship between the percentage of company capital held by blocks of external shareholders and the proportion of women sitting on b) nomination, c) remuneration, and d) audit committees.*

*H3b, H3c, and H3d: There is a curvilinear relationship between the percentage of company capital held by board members and the proportion of women sitting on the b) nomination, c) remuneration, and d) audit committees.*

### 3. METHODOLOGY AND DATA

#### 3.1. Data and study sample

For all the companies listed on the composite TSX as of 2015, financial data were collected from the Stock Guide database for the period 2007-2015. For each company, accounting data were collected from the Stock Guide database, similar to several other studies (Adjaoud & Ben-Amar, 2010; Dinh, Schultze, List, & Zbiegły, 2020; Rakoto, 2016) because of the availability and accessibility of the data; annual reports were used to verify the validity of the information. All of the variables relating to corporate governance and ownership structure were obtained from the NRG Metrics database or directly from companies' proxy circulars. Circulars and annual reports were viewed on the SEDAR website. The data on stock returns required to calculate the standard deviation of these returns were obtained from the Thomson One database. There were 307 companies in the Stock Guide database for

a total sample of 1,547 observations. However, after the Stock Guide database data were merged with the other databases, our final sample, for which there are no missing data, consists of 1,246 observations and 242 companies.

#### 3.2. Methodology

In order to verify whether there is a substitution effect between companies' ownership structure and the presence of women on these companies' boards of directors and their various board committees, we use a regression model with panel data. We construct three models: an OLS, a fixed-effects, and a random-effects model. Since our dependent variable is a percentage, we use the angular transformation (ASIN) value of the percentage of women on company boards and these boards' committees (Ahrens, Cox, & Budhwar, 1990). We then run a Hausman test to see which model best fits the data. The model we use is as follows:

$$F_{BOARD_{i,t}} = \alpha_0 + \alpha_1 CEO_{OWN_{i,t}} + \alpha_2 CEO_{OWN_{i,t}}^2 + \alpha_3 MAN_{OWN_{i,t}} + \alpha_4 MAN_{OWN_{i,t}}^2 + \alpha_5 EXT_{BLOCK_{i,t}} + \alpha_6 EXT_{BLOCK_{i,t}}^2 + \alpha_7 BOARD_{OWN_{i,t}} + \alpha_8 BOARD_{OWN_{i,t}}^2 + \alpha_9 BOARD_{SIZE_{i,t}} + \alpha_{10} IND_{DIR_{i,t}} + \alpha_{11} CEO_{TEN_{i,t}} + \alpha_{12} DUAL_{i,t} + \alpha_{13} SD_{SR_{i,t}} + \alpha_{14} DEBT_{i,t} + \alpha_{15} LN_{REV_{i,t}} + \alpha_{16} CF_{REV_{i,t}} + \alpha_{17} CF_{REV_{i,t}}^2 + \alpha_{18} CREATION_{YEAR_{i,t}} + \alpha_{19} YEAR_{i,t} + \alpha_{20} INDUSTRY_{i,t} + \varepsilon_{i,t} \quad (1)$$

where the variables are as follows.

##### Dependent variables:

$F_{BORDS_{i,t}}$ : ASIN value of the percentage of women on boards [H1a, H2a, and H3a];

$F_{NOM_{i,t}}$ : ASIN value of the percentage of women on nomination committees [H1b, H2b, and H3b];

$F_{REM_{i,t}}$ : ASIN value of the percentage of women on remuneration committees [H1c, H2c, and H3c];

$F_{AUDIT_{i,t}}$ : ASIN value of the percentage of women on audit committees [H1d, H2d, and H3d].

##### Independent variables of interest:

$CEO_{OWN_{i,t}}$  and  $CEO_{OWN_{i,t}}^2$ : the number of shares held by CEOs divided by the total number of shares in circulation and its square root [H1ai, H1bi, H1ci, and H1di].

$MAN_{OWN_{i,t}}$  and  $MAN_{OWN_{i,t}}^2$ : the number of shares held by the management team (excluding the CEO) divided by the total number of shares in circulation and its square root [H1aii, H1bii, H1cii, and H1dii].

$EXT_{BLOCK_{i,t}}$  and  $EXT_{BLOCK_{i,t}}^2$ : the number of shares held by the external blockholders (individuals, families, unlisted companies, venture capitalists, private equities, etc.) divided by the total number of shares in circulation and its square root [H2a, H2b, H2c, and H2d].

$BOARD_{OWN_{i,t}}$  and  $BOARD_{OWN_{i,t}}^2$ : the number of shares held by board members divided by the total number of shares in circulation and its square root [H3a, H3b, H3c, and H3d].

##### Three categories of control variables:

1. *Control variables related to corporate governance.* Several pieces of research focus on the links between board characteristics and the proportion of women on company boards. For example, research shows that the presence of women on a board is positively influenced by board size (Geiger & Marlin, 2012; Hillman et al., 2007; Nekhili & Gatfaoui, 2013) and independence (Nekhili & Gatfaoui, 2013). Following the example of

several studies (Esteban-Salvador, 2011; Geiger & Marlin, 2012; Hillman et al., 2007), we introduce the following variables to take into account the impact of the internal characteristics of boards of directors on the representation of women on these boards:

$BOARD_{S_{i,t}}$  (Board size): number of board members of firm  $i$  in year  $t$ ;

$IND_{DIR_{i,t}}$  (Independent directors): the percentage of shares held by the independent directors of the board of firm  $i$  in year  $t$ ;

$CEO_{TEN_{i,t}}$ : the number of years for which the CEO is in office;

$DUAL_{i,t}$  (Dual position of CEO and chairman) = 1 if the positions of the CEO and chairman for firm  $i$  in year  $t$  are held by different persons, and zero otherwise.

2. *Control variables related to firm risk.* In addition, a company's level of risk (de Cabo, Gimeno, & Nieto, 2012) can influence the presence of women on its board (Nekhili & Gatfaoui, 2013). In several studies, it is argued that female executives make less risky decisions than male executives (Charness & Gneezy, 2012; Eckel & Grossman, 2008; Jianakoplos & Bernasek, 1998; Olsen & Cox, 2001). To consider the impact of a company's risk on the presence of women on its board of directors, the following variables are introduced into our model:

$SD_{SR_{i,t}}$ : monthly standard deviation of stock returns;

$DEBT_{i,t}$ : total debt divided by total equity of firm  $i$  in year  $t$ .

3. *Control variables related to a firm's financial information.* Finally, we control for firm size (Hillman et al., 2007; Sila, Gonzalez, & Hagendorff, 2016), the agency cost of free cash flow (Jensen, 1986; Jensen & Meckling, 1976), the creation year (Hillman et al., 2007) and industry (Nekhili & Gatfaoui, 2013).

$LN_{REV_{i,t}}$ : the natural logarithm of firm  $i$ 's revenues in year  $t$ ;

$CF_{REV_{i,t}}$  and  $CF_{REV_{i,t}}^2$  (Cash flow generated from operational activities): the sum of income before extraordinary items and minority interest plus all non-cash charges of firm  $i$  in year  $t$  divided by its total revenues and its square root;

$CREATION_{YEAR}$ : the year the company was created.

$INDUSTRY_{i,t}$ : the industry in which the company is situated (Brammer, Millington, & Pavelin, 2007).

## 4. RESULTS

### 4.1. Descriptive statistics

Table 1 presents the descriptive statistics of the variables of our econometric models. First, we note that the average female representation on the boards of directors of the companies that make up the composite TSX for the period 2007-2015 is only 12.76%. In addition, their presence on the nomination, remuneration, and audit committees is even lower at 5.38%, 5.78%, and 6.14%, respectively.

**Table 1.** Descriptive statistics for regression variables

Variable	Mean	Std. Dev.	Min	Max
$F_{BORDS_{i,t}}$	12.76%	11.11%	0.00%	62.50%
$F_{NOM_{i,t}}$	5.38%	7.50%	0.00%	40.00%
$F_{REM_{i,t}}$	5.78%	7.24%	0.00%	35.71%
$F_{AUDIT_{i,t}}$	6.14%	7.82%	0.00%	50.00%
$CEO_{OWN_{i,t}}$	1.12%	3.56%	0.00%	43.72%
$MAN_{OWN_{i,t}}$	0.54%	3.19%	0.00%	65.59%
$EXT_{BLOCK_{i,t}}$	5.62%	16.89%	0.00%	94.69%
$BOARD_{OWN_{i,t}}$	2.46%	5.84%	0.00%	65.66%
$BOARD_{S_{i,t}}$	9.74	3.10	1.00	21.00
$IND_{DIR_{i,t}}$	77.17	13.03	11.00	100.00
$CEO_{TEN_{i,t}}$	8.03	6.81	1.00	51.00
$DUAL_{i,t}$	15.79%	36.47%	0.00%	100.00%
$SD_{SR_{i,t}}$	10.07%	6.66%	2.56%	62.57%
$DEBT_{i,t}$	53.63%	22.61%	-3.33%	117.75%
$REVENUS_{i,t}^a$	6,289	9,697	1,043	5,439
$CF_{REV_{i,t}}$	25.44%	50.25%	-1417.59%	96.34%
$CREATION_{YEAR_{i,t}}$	1,970	43	1,670	2,013
$N$	1,246			

Note:  $a$ : in millions

This table provides the mean, standard deviation, min and max. of the regression variables. The sample comprises 1246 firm-year observations, representing 242 unique firms over the 2007-2015 period.

Next, we observe that on average, CEO ownership is 1.12%, managerial ownership is 0.54%, that 5.62% blocks of external shareholders constitute, on average, 5.62% of all shareholders and, finally, that board members hold 2.46% of the shares of the companies they manage.

Regarding the governance variables, Table 1 indicates that the average board in our sample consists of 9.74 members; that, on average, 77.17% of these members are independent; that the CEOs are in office for an average of 8 years; and that 15.79% of these managers perform the dual function of CEO and chairman of their boards of directors. On these companies' financial data, we observe that the standard deviation of these firms' average share prices is 10.07%, the average debt is 53.63%, the average annual income is \$6,289 million and the average cash flow is 25.44% of total average sales.

Table 2 presents the Pearson correlation coefficients between the variables in our econometric models. Correlations greater than 40% are in bold, except for the correlations between our dependent variables. First, the correlation between board size ( $BOARD_S$ ) and firm size as measured by income ( $LN_{REV}$ ) is 0.67, the correlation between  $BOARD_S$  and  $DEBT$  is 0.47; and a correlation between  $BOARD_S$  and females on boards ( $F_{BOARD}$ ) and remuneration committees ( $F_{REM}$ ) is 0.45. Next, we observe respective correlations of 0.56 and 0.43 between the coefficient of  $DEBT$  and  $LN_{REV}$  as well as  $DEBT$  and  $F_{BOARD}$ . There is also a correlation higher than 40% between the coefficient of  $LN_{REV}$  and  $F_{BOARD}$  (0.45) and cash flow ( $CF_{REV}$ ) (-0.41). Finally, there is a correlation greater than 40% between board ownership ( $BOARD_{OWN}$ ) and managerial ownership ( $MAN_{OWN}$ ) (0.44) and CEO ownership ( $CEO_{OWN}$ ) (0.40) as well as between  $MAN_{OWN}$  and independent directors ( $IND_{DIR}$ ) (-0.55). As we can see, all of these correlations are as expected and are not important enough to create multicollinearity problems. To test for this, we calculated the VIF and no variable has a value greater than 5.

Table 2. Correlation matrix

Variables	$F_{BORDS_{i,t}}$	$F_{NOM_{i,t}}$	$F_{REM_{i,t}}$	$F_{AUDIT_{i,t}}$	$MAN_{OWN_{i,t}}$	$CEO_{OWN_{i,t}}$	$EXT_{BLOCK_{i,t}}$	$BOARD_{OWN_{i,t}}$	$BOARD_{S_{i,t}}$	$IND_{DIR_{i,t}}$	$CEO_{TEN_{i,t}}$	$DUAL_{i,t}$	$SD_{SR_{i,t}}$	$DEBT_{i,t}$	$LN_{REV_{i,t}}$
$F_{BORDS_{i,t}}$	1,00														
$F_{NOM_{i,t}}$	0,61**	1,00													
$F_{REM_{i,t}}$	0,64**	0,56**	1,00												
$F_{AUDIT_{i,t}}$	0,69**	0,45**	0,49**	1,00											
$MAN_{OWN_{i,t}}$	-0,13**	-0,09**	0,13**	-0,19**	1,00										
$CEO_{OWN_{i,t}}$	-0,26**	-0,22**	-0,23**	-0,26**	0,13**	1,00									
$EXT_{BLOCK_{i,t}}$	-0,02	0,05	0,01	-0,09**	0,04	-0,19**	1,00								
$BOARD_{OWN_{i,t}}$	-0,31**	-0,26**	-0,28**	-0,27**	<b>0,44**</b>	<b>0,40**</b>	-0,07*	1,00							
$BOARD_{S_{i,t}}$	<b>0,45**</b>	0,31	<b>0,45**</b>	0,34	-0,04	-0,35**	0,11**	-0,21**	1,00						
$IND_{DIR_{i,t}}$	0,22**	0,18**	0,25	0,30**	<b>-0,55**</b>	-0,09**	-0,23**	-0,30**	0,21	1,00					
$CEO_{TEN_{i,t}}$	0,03	0,00	0,01**	0,00	0,02	0,16**	-0,07*	0,08**	-0,07	-0,04**	1,00				
$DUAL_{i,t}$	0,16**	0,13**	0,22**	0,01**	-0,04**	-0,21**	-0,02	-0,04	0,16**	0,19**	-0,10**	1,00			
$SD_{SR_{i,t}}$	<b>0,40**</b>	-0,24**	-0,29**	-0,27**	0,11**	0,08**	0,00	0,13**	-0,31**	-0,13*	-0,08*	-0,08**	1,00		
$DEBT_{i,t}$	<b>0,43**</b>	0,20**	0,31**	0,37**	-0,06**	-0,16**	0,01	-0,12**	<b>0,47**</b>	0,19*	0,06**	0,06*	-0,46**	1,00	
$LN_{REV_{i,t}}$	<b>0,45**</b>	0,29**	0,36**	0,39**	-0,10**	-0,32**	0,09**	-0,32**	<b>0,67**</b>	0,22	-0,07	0,08**	-0,39**	<b>0,56**</b>	1,00
$CF_{REV_{i,t}}$	-0,21**	-0,15**	-0,16**	-0,17**	0,01**	0,06*	-0,09**	0,04	-0,23	-0,01	-0,02	-0,02	0,10**	-0,36**	<b>-0,41**</b>

Notes: This table presents pairwise correlation coefficients between the regression variables. The sample comprises 1,246 firm-year observations representing 242 unique firms over the 2007-2015 period.

\* Statistical significance at the 5% level (bilateral).

\*\* Statistical significance at the 1% level (bilateral).

#### 4.2. Influence of ownership structure on the presence of women on boards of directors

Table 3 presents the results of the fixed- and random-effects regression models as well as the results of a model using OLS. These models assess the influence of the percentage of company ownership held by the CEO, management, external shareholders, and members of boards of directors on the percentage of women on these boards. Before proceeding to the analysis of the results, a Wald test is carried out on the OLS model. This model indicates the presence of time and firm effects with  $\text{Prob.} > F = 0.00$  in both cases, meaning that it is better to use models that take into account our panel data. The Hausman test tells us that our fixed-effects model is a better fit for our data; therefore, our analyses only report the results of this model.

As we can see in Model 3 of Table 3, the  $CEO_{OWN}$  coefficient is negative and significant (Coef. = -0.69; T-test = -1.70), as predicted by  $H1ai$ , and its squared value is positive and significant (Coef. = 2.269; T-test = 2.08), also as predicted in  $H1ai$ . Thus, these results support the hypothesis of a curvilinear relationship between the proportion of capital held by CEOs and the proportion of women sitting on boards of directors of Canadian firms ( $H1ai$ ), which supports the substitution effect between the two governance mechanisms of board diversity and CEO

ownership. As for  $MAN_{OWN}$ , the coefficient is positive and significant (Coef. = 1.114; T-test = 2.21) and its square root is negative and only slightly significant (Coef. = -2.098; T-test = -1.59), which is contrary to what was expected according to  $H1aii$ . These last results do not support  $H1aii$ ; this demonstrates the importance of considering CEOs separately from other managers, given that their coefficients present opposite signs.

Regarding the control variables, we first observe that board size is positively related to the presence of women on a board, which is in accordance with Brieger, Francoeur, Welzel, and Ben-Amar (2019), Geiger and Marlin (2012), Hillman et al. (2007). Next, we see that board independence is positively and significantly linked to the presence of women. This result is as expected, given that several studies find that when women sit on boards, this improves these boards' counseling performance. However, the results indicate that the other governance variables,  $CEO_{TEN}$  and  $DUAL$ , do not influence the presence of women on boards. As with Sila et al. (2016), we also note that the risk in terms of the volatility of share prices has an inverse relationship with the presence of women on boards. However, financial risk ( $DEBT$ ) has a positive relationship. Finally, the results indicate that firm size positively influences the presence of women on boards.

**Table 3.** The influence of board and external block ownership on the presence of women sitting on boards of directors

Variables	Hypothesis	M1 OLS			M2 Random effect			M3 Fixed effect		
		Est.	SD	T-test	Est.	SD	T-test	Est.	SD	T-test
$CEO_{OWN_{i,t}}$	$H1ai (-)$	-0.201	0.324	-0.62	-0.755	0.353	-2.14**	-0.690	0.405	-1.70**
$CEO_{OWN_{i,t}}^2$	$H1ai (+)$	2.223	0.969	2.29**	3.136	1.108	2.83***	2.269	1.293	2.08**
$MAN_{OWN_{i,t}}$	$H1aii (-)$	1.193	0.5	2.39***	1.277	0.46	2.78***	1.114	0.504	2.21**
$MAN_{OWN_{i,t}}^2$	$H1aii (+)$	-2.939	1.453	-2.02**	-2.59	1.215	-2.13**	-2.098	1.322	-1.59*
$EXT_{BLOCK_{i,t}}$	$H2a (-)$	-0.135	0.097	-1.39*	-0.318	0.128	-2.49***	-0.037	0.156	-2.37**
$EXT_{BLOCK_{i,t}}^2$	$H2a (+)$	0.164	0.131	1.25	0.356	0.164	2.18**	0.397	0.194	2.05**
$BOARD_{OWN_{i,t}}$	$H3a (-)$	-1.212	0.357	-3.40***	-0.915	0.324	-2.82***	-0.778	0.346	-2.25**
$BOARD_{OWN_{i,t}}^2$	$H3a (+)$	2.738	1.318	2.08**	1.821	1.064	1.71**	1.334	1.115	1.20
$BOARD_{S_{i,t}}$		0.021	0.002	8.85***	0.01	0.003	3.84***	0.007	0.009	2.69**
$IND_{DIR_{i,t}}$		0.001	0	3.60***	0.001	0.001	2.64***	0.001	0.001	1.96**
$CEO_{TEN_{i,t}}$		0.001	0.001	1.76*	0	0.001	-0.72	-0.009	0.001	-1.27
$DUAL_{i,t}$		0.049	0.015	3.29***	0.024	0.019	1.30	0.006	0.022	0.28
$SD_{SR_{i,t}}$		-0.235	0.09	-2.63***	-0.458	0.102	-4.49***	-0.495	0.120	-4.12***
$DEBT_{i,t}$		0.045	0.032	1.38	0.131	0.044	2.98***	0.164	0.055	2.96***
$LN_{REV_{i,t}}$		0.028	0.005	5.91***	0.032	0.007	4.51***	0.051	0.012	4.22***
$CF_{REV_{i,t}}$		-0.023	0.007	-3.32***	-0.009	0.021	-0.42	-0.010	0.024	-0.46
$CF_{REV_{i,t}}^2$		0	0	3.44***	0.001	0.002	0.42	0.000	0.002	0.23
$CREATION_{YEAR_{i,t}}$		1,035E-05	0.000	0.07	0.000	0.000	0.60			
$INDUSTRY_{i,t}$		YES								
$YEAR$		YES								
Intercept		-0,728	0.314	-2.31**	-0.994	0.626	-1.59	-0.747	0.286	-2.61***
R <sup>2</sup>		0.425			0.163			0.81		
Adj. R <sup>2</sup>		0.408								
N		1226								

Notes: \*\*\*  $p \leq 0.01$ ; \*\*  $p \leq 0.05$ ; \*  $p \leq 0.10$ ; (one-way test when the sign is expected and bidirectional test when the sign is not expected). This table presents the regression results of the influence of board and external block ownership on the presence of women sitting on boards of directors. The sample includes 1,246 firm-year observations representing 242 unique firms over the 2007-2015 period.

\* Statistical significance at the 10% level.

\*\* Statistical significance at the 5% level.

\*\*\* Statistical significance at the 1% level.



#### 4.3. Influence of blocks of shareholders on the presence of women on boards of directors

As shown in Table 3 (column M3, fixed effects), the coefficient of the variable  $EXT_{BLOCK}$  is negative and significant (Coef. = -0.037; T-test = -2.37), while the coefficient of the variable squared ( $EXT_{BLOCK}^2$ ) is positive and significant (Coef. = 0.397; T-test = 2.05). This indicates that the percentage of shares held by controlling blocks is negatively related to the presence of women on companies' boards up to a certain level and that, thereafter, the relationship becomes the reverse. These results are fully expected and highlight a curvilinear relationship between the presence of women on companies' boards and the presence of blocks of external shareholders, as predicted by *H2a*. These results support the substitution effect between these two factors. Such a relationship means an increase in the potential for agency conflicts that can result from higher ownership by external shareholders over some optimum point is accompanied by an increase in the proportion of women on these firms' boards of directors. This ensures that the interests of small shareholders are protected from a possible risk of expropriation.

#### 4.4. Influence of directors' participation in companies' capital on the presence of women on boards of directors

As shown in Table 3 (column M3, fixed effects), the coefficient of the variable  $BOARD_{OWN}$  is negative and significant (Coef. = -0.778; T-test = -2.25) and the coefficient of the variable squared ( $BOARD_{OWN}^2$ ) is not significant (Coef. = 1.334; T-test = 1.20); thus, rejecting the hypothesis of a curvilinear relationship between the proportion of capital held by managers and the proportion of women sitting on the boards of directors of Canadian firms (*H3a*).

Even if the relation is not curvilinear, the significant negative coefficient of  $BOARD_{OWN}$  means that the less directors participate in shareholding, the more female presence there is on boards of directors. This is reassuring since the possible governance problem that is linked to board members' low participation in their companies' capital seems to be attenuated by the governance mechanism that is linked to the presence of women on boards of directors. Therefore, even if the relationship between company ownership by board members and the proportion of women on boards is not curvilinear, the results still support a substitution effect between these two factors, but only within a certain critical threshold. After this threshold, the results become insignificant. These results agree with other authors who find that, after a certain threshold, the relationship between board or management ownership of a company and the well-being of that firm (i.e., performance) becomes either inverted (curvilinear relation) or simply not significant (Craswell, Taylor, & Saywell, 1997; McConnell & Servaes, 1990; Morck et al., 1988) as is the present case.

#### 4.5. Impact of the shareholding structure on the presence of women in board committees

Table 4 presents the results of the different fixed-effects regression models used to estimate the impact of a firm's shareholding structure on the presence of women on the various sub-committees of these boards. First, we observe in columns M1 (nomination committee) and M2 (remuneration committee) that the  $CEO_{OWN}$  coefficients are both negative and significant (Coef. = -0.938; T-test = -2.22) (Coef. = -1.064; T-test = -2.59), while their squared values ( $CEO_{OWN}^2$ ) are both positive and significant (Coef. = 3.460; T-test = 2.56) (Coef. = 4.045; T-test = 3.08). These results support hypotheses *H1bi* and *H1ci*; i.e., a curvilinear relationship exists between the presence of women on nomination and remuneration committees and CEO ownership. These results support the substitution effect between these two governance mechanisms.

Regarding the  $MAN_{OWN}$  and  $MAN_{OWN}^2$  coefficients in columns M1 (nomination committee) and M2 (remuneration committee), we can see that they are either not significant or have the opposite sign from that predicted in our hypothesis. These results allow us to reject *H1bi* and *H1ci*. In column M1 (nomination committee), we note that the coefficients of the variables  $EXT_{BLOCK}$  and  $EXT_{BLOCK}^2$  and  $BOARD_{OWN}$  and  $BOARD_{OWN}^2$  are all insignificant; thus, rejecting the hypothesis of a curvilinear relationship between the percentage of women on nomination committees and shareholder ownership in external blocks (*H2b*) and among members of boards of directors (*H3b*). In column M2 (remuneration committee), we note that the coefficients of the variables  $EXT_{BLOCK}$  and  $EXT_{BLOCK}^2$  are insignificant; thus, rejecting the hypothesis of a curvilinear relationship between the percentage of women on remuneration committees and external blocks of shareholder ownership (*H2c*). We also see in column M2 (remuneration committee) that the coefficient of  $BOARD_{OWN}$  is negative and slightly significant (Coef. = -0.574; T-test = -1.63) and that  $BOARD_{OWN}^2$  is positive and again only marginally significant (Coef. = 1.620; T-test = 1.43). These results allow only modest support for *H3c*.

In column M3 (audit committee), we note that the  $CEO_{OWN}$  coefficient is negative and significant (Coef. = -1.064; T-test = -2.63) and that the  $CEO_{OWN}^2$  coefficient is positive and significant (Coef. = 2.481; T-test = 1.92). These results support *H1di*, according to which there is a curvilinear relationship between the percentage of capital held by CEOs and the proportion of women sitting on audit committees. The results of Table 3 indicate, however, that both  $MAN_{OWN}$  and  $MAN_{OWN}^2$  are not significant; thus, *H1di* is rejected. Still in column M3 (audit committee), we also note that the coefficient of the variable  $EXT_{BLOCK}$  is negative and significant (Coef. = -0.724; T-test = -4.65), while the coefficient of the variable squared ( $EXT_{BLOCK}^2$ ) is positive and significant (Coef. = 0.843; T-test = 4.36). This also indicates a negative relationship between the presence of women on audit committees and the percentage of companies' capital held by blocks of external shareholders up to a certain threshold, where

the relation then becomes positive, confirming *H2d*, that a curvilinear relationship exists between the percentage of companies' capital held by blocks of external shareholders and the proportion of women sitting on audit committees. Finally, Model 3 indicates that the coefficient of the variable  $BOARD_{OWN}$  is negative and significant (Coef. = -0.813; T-test = -2.35), while the coefficient of the variable squared ( $BOARD_{OWN}^2$ ) is not significant (Coef. = 1.259; T-test = 1.13). As is the case for board members, these results indicate that a negative relationship

exists between the presence of women on audit committees and the percentage capital ownership of board members up to a certain threshold after which it then becomes nonsignificant. This does not confirm *H1d*, which states there is a curvilinear relationship between the percentage of companies' capital held by members of their boards of directors and the proportion of women sitting on these boards' audit committees, but it still supports the substitution hypothesis, at least until board ownership reaches a certain threshold.

**Table 4.** Fixed-effects models of the influence of board and external block ownership on the presence of women sitting on nomination, remuneration, and audit committees

Variables	Hypothesis	M1 b) Nomination			M2 c) Remuneration			M3 d) Audit		
		Est.	SD	T-test	Est.	SD	T-test	Est.	SD	T-test
$CEO_{OWN,t}$	<i>H1bi, ci, di (-)</i>	-0.938	0.424	-2.22*	-1.064	0.411	-2.59	-1.064	0.405	-2.63**
$CEO_{OWN,t}^2$	<i>H1bi, ci, di (+)</i>	3.460	1.350	2.56**	4.045	1.312	3.08	2.481	1.291	1.92*
$MAN_{OWN,t}$	<i>H1bii, cii, dii (-)</i>	0.933	0.527	1.77*	0.647	0.512	1.26	-0.083	0.504	-0.16
$MAN_{OWN,t}^2$	<i>H1bii, cii, dii (+)</i>	-1.768	1.381	-1.28*	-1.726	1.341	-1.29*	0.114	1.320	0.09
$EXT_{BLOCK,t}$	<i>H2 b, c, d (-)</i>	-0.090	0.163	-0.55	0.010	0.158	0.07	-0.724	0.156	-4.65**
$EXT_{BLOCK,t}^2$	<i>H2 b, c, d (+)</i>	-0.023	0.203	-0.11	-0.058	0.197	-0.30	0.843	0.194	4.36**
$BOARD_{OWN,t}$	<i>H3 b, c, d (-)</i>	-0.118	0.362	-0.33	-0.574	0.351	-1.63*	-0.813	0.346	-2.35**
$BOARD_{OWN,t}^2$	<i>H3 b, c, d (+)</i>	0.501	1.165	0.43	1.620	1.131	1.43*	1.259	1.114	1.13
$BOARD_{S,t}$		-0.005	0.003	-1.71*	0.000	0.003	0.13	0.005	0.003	1.60
$IND_{DIR,t}$		0.002	0.001	3.13**	0.000	0.001	0.48	0.001	0.001	1.09
$CEO_{TEN,t}$		-0.001	0.001	-0.96	-0.001	0.001	-1.99*	0.000	0.001	-0.20
$DUAL_{i,t}$		-0.039	0.023	-1.71*	0.006	0.022	0.26	0.006	0.022	0.29
$SD_{SR,t}$		-0.231	0.126	-1.84*	-0.148	0.122	-1.21	-0.316	0.120	-2.63**
$DEBT_{i,t}$		0.051	0.058	0.88	-0.078	0.056	-1.39	0.242	0.056	4.36**
$LN_{REV,t}$		0.010	0.013	0.82	0.028	0.013	2.25**	0.030	0.012	2.43*
$CF_{REV,t}$		0.063	0.025	2.52**	-0.040	0.024	-1.67*	-0.002	0.024	-0.09
$CF_{REV,t}^2$		0.005	0.002	2.86**	-0.002	0.002	-0.96	0.000	0.002	-0.14
$CREATION_{YEAR,t}$										
Intercept		-0.249	0.299	-0.83	-0.211	0.290	-0.73	-0.432	0.286	-1.51
R <sup>2</sup>		0.708			0.719			0.745		
N		1226								

Notes: \*\*\*  $p \leq 0.01$ ; \*\*  $p \leq 0.05$ ; \*  $p \leq 0.10$  (one-way test when the sign is expected and bidirectional test when the sign is not expected). This table presents the regression results of the fixed-effects models of the influence of board and external block ownership on the presence of women sitting on nomination, remuneration, and audit committees.

\* Statistical significance at the 10% level.

\*\* Statistical significance at the 5% level.

\*\*\* Statistical significance at the 1% level.

## 5. ADDITIONAL ANALYSIS

Finally, we perform dynamic models to ensure the robustness of our results in the face of the potential problem of endogeneity between the presence of women on boards and various board committees and the extent of company ownership of various shareholders.

In the context of this study, there are three potential sources of endogeneity. First, it is possible that the relationship between the presence of women on boards (dependent variables) and board members' shareholdings (control variable of interest) is linked to the effect of another unobservable variable. We can check whether this is the case by checking the correlation between the variables in our models and the residuals of the regressions.

This is correctable by using a fixed-effects model that considers the effect of the firm.

There can also be a reverse causality effect. In this case, this would be the presence of women on boards as having an influence on the shareholder structure and not the other way around. However, this is unlikely given that the literature already agrees that board characteristics are determined by firm-specific characteristics.

"There is a general consensus in the literature that board characteristics [...] are endogenously chosen by firms to suite their own operation and information environments and the bargaining power of various stakeholders in the firm" (Sila et al., 2016, p. 29).

However, we could be in the presence of simultaneity, that is to say, that the explanatory

variable is jointly determined with the dependent variable or, in other words, X causes Y but Y also causes X. In our case, this means that although companies' ownership structure can influence the presence of women on boards, the presence of women on boards can also influence companies' ownership structure. In this case, we could face an endogeneity problem that can be corrected by a dynamic model (Ullah, Akhtar, & Zaefarian, 2018). In the context of this study, a dynamic two-step generalized method of moments (GMM) model (Arellano & Bover, 1995; Blundell & Bond, 1998)

corrects for the possibility that board members' shareholdings are influenced by the previous presence of women on boards by incorporating the lagged values of the dependent variables as the explanatory variables. Note that the two-step GMM model also corrects for the endogeneity caused by the omission of unobservable variables as well as the firm effects and that this model considers the temporal nature of our data. To control for the plausible endogeneity problem, we use the following general dynamic GMM model (Arellano & Bond, 1991; Blundell & Bond, 1998):

$$\begin{aligned}
 F_{BOARD_{i,t}} = & \alpha_0 + \alpha_1 F_{BOARD_{i,t-1}} + \alpha_2 CEO_{OWN_{i,t}} + \alpha_3 CEO_{OWN_{i,t}}^2 + \alpha_4 MAN_{OWN_{i,t}} + \alpha_5 MAN_{OWN_{i,t}}^2 + \\
 & \alpha_6 EXT_{BLOCK_{i,t}} + \alpha_7 EXT_{BLOCK_{i,t}}^2 + \alpha_8 BOARD_{OWN_{i,t}} + \alpha_9 BOARD_{OWN_{i,t}}^2 + \alpha_{10} BOARD_{SIZE_{i,t}} + \\
 \alpha_{11} IND_{DIR_{i,t}} + & \alpha_{12} CEO_{TEN_{i,t}} + \alpha_{13} DUAL_{i,t} + \alpha_{14} SD_{SR_{i,t}} + \alpha_{15} DEBT_{i,t} + \alpha_{16} LN_{REV_{i,t}} + \alpha_{17} CF_{REV_{i,t}} + \\
 & \alpha_{18} CF_{REV_{i,t}}^2 + V_i + \varepsilon_{i,t}
 \end{aligned} \quad (2)$$

where:  $F_{BOARD_{i,t}}$  denotes the proportion of women on boards of directors;  $F_{BOARD_{i,t-1}}$  is a one-period lag value of the proportion of women on boards of directors; the variables from  $\alpha_2$  to  $\alpha_{18}$  are the same as in the fixed-effects model;  $V_i$  is the firm-specific fixed effects; and  $\varepsilon_{i,t}$  represents the error term. We also perform this regression model by using the proportion of women on different board committees as dependent variables ( $F_{NOM_{i,t}}$ ,  $F_{REM_{i,t}}$ , and  $F_{AUDIT_{i,t}}$ ) and using their one-period lag value as an independent variable. The results of our dynamic GMM model are shown in Table 5. Overall, these results are essentially the same as those of the fixed-effects model, but we no longer obtain a negative significant relationship between CEO ownership and the presence of women on boards of directors (M1), nor do we see this on the nomination (M2) and remuneration committees (M3). Other authors point out the potential endogeneity when dealing with ownership structure and board characteristics (Sila et al., 2016; Tinker & Okcabol, 1991). We thus interpret these divergent results to the endogeneity effect that may exist between the ownership structure and the presence of women on boards directors or within these boards' committees. Thus, our hypotheses  $H1ai$ ,  $H1bi$ , and  $H1ci$  are no longer maintained. The results of the GMM model also indicate that the results concerning  $H3c$  in Model 2 are no longer significant, meaning they no longer support the presence of a curvilinear relationship between the presence of women on remuneration committees and board ownership of company shares. These results are not surprising

given they were only significant at the 10% level in the fixed-effects model.

However, the results still indicate a curvilinear relationship between the presence of women on boards and external blockholder ownership (M1), the presence of women on audit committees and CEO ownership (M4), and the presence of women on audit committees and external blockholder ownership (M4). In addition, the coefficient  $BOARD_{OWN}^2$  in both M1 and M4 are now significant, making both the relationship between board ownership of company shares and the presence of women on these firms' boards (M1) and the relationship between and board share ownership and women on audit committees (M4) curvilinear.

To ensure the validity of our GMM models, we perform Sargan's (1958) error autocorrelation tests (Arellano & Bond, 1991; Arellano & Bover, 1995). Using Sargan's test ensures that the error term is not correlated with all of the exogenous variables. The non-significance of Sargan's coefficient value for our four models indicates that the error term is not correlated with all of our exogenous variables. This means that our models are not over identified. In addition, to obtain consistent estimates, the estimators require that the error term not be serially correlated (Cameron & Pravin, 2010), meaning that the Arellano and Bond's (1991) error autocorrelation test is significant for [AR (1)] and not significant for [AR (2)]. As we can see in all of our four models, [AR (1)] is significant and [AR (2)] is not significant. Therefore, our models present consistent estimators and are considered adequate.

**Table 5.** Dynamic generalized method of moments models of the influence of board and external block ownership on the presence of women boards and board committees

Variables	Hypothesis	M1 a) Board			M2 b) Nomination			M3 c) Remuneration			M4 d) Audit		
		Est.	SD	T-test	Est.	SD	T-test	Est.	SD	T-test	Est.	SD	T-test
F (Lag 1)		0.658	0.082	8.02	0.165	0.048	3.47	0.033	0.045	0.72	-0.055	0.034	-1.61
$CEO_{OWN_{i,t}}$	H1ai, bi, ci, di (-)	0.173	0.399	0.43	-0.513	0.626	-0.82	-0.017	0.483	-0.03	-1.146	0.541	-2.12**
$CEO_{OWN_{i,t}}^2$	H1ai, bi, ci, di (+)	-0.2	1.14	-0.21	2.233	1.857	1.2	1.373	1.623	0.85	2.689	1.36	1.98**
$MAN_{OWN_{i,t}}$	H1aii, bii, cii, dii (-)	0.985	0.581	1.70**	0.55	0.824	0.67	0.357	0.372	0.96	0.483	0.273	1.77**
$MAN_{OWN_{i,t}}^2$	H1aii, bii, cii, dii (+)	-2.3	1.53	-1.52*	-1.008	1.88	-0.54	-0.978	0.969	-1.01	-1.118	0.76	-1.47*
$EXT_{BLOCK_{i,t}}$	H2 a, b, c, d (-)	-0.57	0.252	-2.26**	-0.05	0.216	-0.23	0.175	0.172	1.02	-0.328	0.155	-2.11**
$EXT_{BLOCK_{i,t}}^2$	H2 a, b, c, d (+)	0.66	0.29	2.26**	0.004	0.245	0.02	-0.228	0.199	-1.15	0.381	0.187	2.04**
$BOARD_{OWN_{i,t}}$	H3 a, b, c, d (-)	-1	0.6	-1.67**	-0.184	0.832	-0.22	-0.139	0.326	-0.43	-0.789	0.24	-3.29***
$BOARD_{OWN_{i,t}}^2$	H3 a, b, c, d (+)	2.19	1.62	1.35*	0.565	1.948	0.29	0.751	0.928	0.81	1.578	0.694	2.27**
$BOARD_{S_{i,t}}$		0.012	0.003	4.00***	0.001	0.003	0.47	-0.001	0.003	-0.25	0.005	0.002	2.20**
$IND_{DIR_{i,t}}$		0.002	0.001	1.95*	0.001	0.001	0.82	0.001	0.001	0.79	0	0.001	0.16
$CEO_{TEN_{i,t}}$		0	0.001	-0.22	0	0.001	0.43	0	0.001	0.36	-0.002	0.001	-2.34**
$DUAL_{i,t}$		-0.055	0.031	-1.76*	-0.06	0.025	-2.35	-0.039	0.025	-1.58	-0.025	0.026	-0.97
$SD_{SR_{i,t}}$		-0.38	0.17	-2.23**	-0.178	0.101	-1.76	-0.014	0.09	-0.16	-0.254	0.131	-1.94*
$DEBT_{i,t}$		0.19	0.07	2.73**	0.106	0.059	1.79*	0.054	0.078	0.69	0.174	0.066	2.65**
$LN_{REV_{i,t}}$		0.039	0.016	2.45**	-0.005	0.013	-0.39	0.02	0.013	1.63	0.008	0.012	0.71
$CF_{REV_{i,t}}$		-0.015	0.027	-0.55	0.032	0.018	1.72*	-0.005	0.017	-0.29	-0.001	0.016	-0.03
$CF_{REV_{i,t}}^2$		0	0.002	0.14	0.002	0.001	1.93*	0	0.001	-0.24	0	0.001	-0.31
Intercept		-0.968	0.329	-2.95**	0.171	0.273	0.63	-0.32	0.275	-1.16	-0.081	0.258	-0.32
Sargan test (p-value)				0.2477			0.255			0.469			0.418
AR(1) test (p-value)				<0.0001			0.000			0.019			0.005
AR(2) test (p-value)				0.000			0.449			0.614			0.8499
R <sup>2</sup>													
N		1246											

Notes: \*\*\*  $p \leq 0.01$ ; \*\*  $p \leq 0.05$ ; \*  $p \leq 0.10$  (one-way test when the sign is expected and bidirectional test when the sign is not expected). This table presents an analysis that addresses endogeneity concerns on the influence of board and external block ownership on the presence of women on boards and board committees. Columns M1, M2, M3, and M4 present the results of the dynamic generalized method of moments (GMM) estimation.

\* Statistical significance at the 10% level.

\*\* Statistical significance at the 5% level.

\*\*\* Statistical significance at the 1% level.

## 6. DISCUSSION

Overall the results of this study are interesting because they make it possible to support the view that the composition of boards of directors is established by a process of rational choice that takes into account the characteristics and specific needs of each business enterprise (Boone et al., 2007; Coles et al., 2008; Linck et al., 2008) while also supporting the substitution effect between different governance mechanisms (Bozec & Bozec, 2007; Fraile & Fradejas, 2014).

Indeed, when the governance mechanism regarding ownership structure (concentration of shares in the hands of the CEO, blockholders, and administrators) is sufficient to ensure that the objective of maximizing shareholder wealth is met (Jensen & Meckling, 1976), the presence of women is less necessary. However, when the concentration of shares that are in the hands of the CEO, blockholders, and administrators exceeds a certain threshold, this relation is reversed (curvilinear relation) and supports the entrenchment theory, according to which opportunistic owners

allow themselves to more easily expropriate minority owners (Lennox, 2005; Morck et al., 1988). In this case, it is reassuring to know that the possible governance problem that is linked to the entrenchment effect is accompanied by the governance mechanism that is linked to the presence of women on boards of directors (Beltrami et al., 1984; Jones & Gautschi, 1988; McCabe et al., 2006; Peterson et al., 1991). This study thus supports the view that insider concentration generates two contradictory effects, depending on the level of concentration; these are an incentive effect that allows board members to reduce agency conflicts (Jensen & Meckling, 1976) until a critical level of ownership is achieved and an entrenchment effect that occurs afterward and allows owners to profit from their ownership at the expense of other shareholders (Claessens, Djankov, Fan, & Lang, 2002; Fraile & Fradejas, 2014; Morck et al., 1988; Peasnell et al., 2003).

Our results also indicate that the substitution effect is more present between the shareholder structure and the presence of women on audit committees than by women's mere presence on

boards. This supports the view that having women on companies' boards is simply not as effective as is their presence on the various committees of these boards of directors (Anderson et al., 2004; Beasley, 1996; Harrison, 1987; Jensen, 1993) and, in the particular context of this study, within their audit committees. Indeed, the results of this study do not support the substitution effect between the presence of women on nomination and remuneration committees and companies' ownership structures.

Finally, our results support the idea that the characteristics of a board of directors and a company's ownership structure are established endogenously. These results highlight the importance of using statistical models that control for the endogeneity effect in specific contexts (i.e., board characteristics and ownership structure) in order to achieve consistent results (Sila et al., 2016; Tinker & Okcabol, 1991; Ullah et al., 2018).

## 7. CONCLUSION

This study examines how shareholder structure affects the presence of women on firms' boards. In doing so, it arrives at interesting results. First, based on a sample of 242 Canadian companies listed on the Toronto Stock Exchange for the period 2007-2015 (1,246 observations) and controlling for endogeneity, our results show that the shareholder structure (CEO, blockholder, and board ownership) influences the presence of women on boards and on audit committees. These results are present in the study's fixed-effects models and are still valid in the more robust GMM models. The results give support for a substitution effect between the number of women on audit committees and shareholder structure and also with the literature that considers that the composition of a board of directors is established through a process of rational choice that takes into account a company's specific characteristics and needs.

## REFERENCES

1. Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94(2), 291-309. <https://doi.org/10.1016/j.jfineco.2008.10.007>
2. Adjaoud, F., & Ben-Amar, W. (2010). Corporate governance and dividend policy: Shareholders' protection or expropriation? *Journal of Business Finance & Accounting*, 37(5-6), 648-667. <https://doi.org/10.1111/j.1468-5957.2010.02192.x>
3. Ahrens, W. H., Cox, D. J., & Budhwar, G. (1990). Use of the arcsine and square root transformations for subjectively determined percentage data. *Weed Science*, 38(4-5), 452-458. <https://doi.org/10.1017/S0043174500056824>
4. Aluchna, M., & Kaminski, B. (2017). Ownership structure and company performance: A panel study from Poland. *Baltic Journal of Management*, 12(4), 485-502. <https://doi.org/10.1108/BJM-01-2017-0025>
5. Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2004). Board characteristics, accounting report integrity, and the cost of debt. *Journal of Accounting and Economics*, 37(3), 315-342. <https://doi.org/10.1016/j.jacceco.2004.01.004>
6. Ararat, M., Aksu, M., & Cetin, A. T. (2015). How board diversity affects firm performance in emerging markets: Evidence on channels in controlled firms. *Corporate Governance: An International Review*, 23(2), 83-103. <https://doi.org/10.1111/corg.12103>
7. Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277-297. <https://doi.org/10.2307/2297968>
8. Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29-51. [https://doi.org/10.1016/0304-4076\(94\)01642-D](https://doi.org/10.1016/0304-4076(94)01642-D)
9. Baglioni, A., & Colombo, L. (2013). The efficiency view of corporate boards: Theory and evidence. *Applied Economics*, 45(4), 497-510. <https://doi.org/10.1080/00036846.2011.605764>
10. Bart, C., & McQueen, G. (2013). Why women make better directors. *International Journal of Business Governance and Ethics*, 8(1), 93-99. <https://doi.org/10.1504/IJBGE.2013.052743>
11. Bear, S., Rahman, N., & Post, C. (2010). The impact of board diversity and gender composition on corporate social responsibility and firm reputation. *Journal of Business Ethics*, 97, 207-221. <https://doi.org/10.1007/s10551-010-0505-2>

This study provides important contributions to the literature by expanding on previous studies on how executive participation in corporate ownership affects the presence of women on boards of directors in the Canadian context. More precisely, we study the substitution effect in a context that has not previously been addressed; that is, the ownership structure and the presence of women on boards while paying special attention to board committees. The use of GMM models to correct for the effect of endogeneity between ownership structure and the presence of women on boards is also a contribution of this study. Let us also emphasize that this study enhances the current debate on the importance of having more women on corporate boards in Canada. Indeed, the results support the view that their presence can fill certain gaps in corporate governance mechanisms, especially when these women are also on audit committees. However, if the gaps in these mechanisms are small, then their presence is less crucial and this could explain, to a certain extent, the under-representation of women on the boards of directors of large companies.

While the overall results of this study support the effectiveness of women on Canadian boards and board audit committees as a mechanism for reducing agency conflicts in the Canadian context and its possible substitution effect with companies' capital structures, this subject should continue to be studied as should the possible substitution effect between women on boards and other governance mechanisms. In addition, this study is carried out in a Canadian context where the concentration of ownership is higher than in other countries. Therefore, other studies should look at the substitution effect between the presence of women on boards and the shareholding of companies in a context where the shareholding is more dispersed.

12. Beasley, M. S. (1996). An empirical analysis of the relation between the board of director composition and financial statement fraud. *Accounting Review*, 71(4), 443-465. Retrieved from <https://www.jstor.org/stable/248566>
13. Beltramini, R. F., Peterson, R. A., & Kozmetsky, G. (1984). Concerns of college students regarding business ethics. *Journal of Business Ethics*, 3(3), 195-200. <https://doi.org/10.1007/BF00382919>
14. Birindelli, G., Chiappini, H., & Savioli, M. (2020). When do women on board of directors reduce bank risk? *Corporate Governance: The International Journal of Business in Society*, 20(7), 1307-1327. <https://doi.org/10.1108/CG-03-2020-0089>
15. Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
16. Boone, A. L., Field, L. C., Karpoff, J. M., & Raheja, C. G. (2007). The determinants of corporate board size and composition: An empirical analysis. *Journal of Financial Economics*, 85(1), 66-101. <https://doi.org/10.1016/j.jfineco.2006.05.004>
17. Bozec, Y., & Bozec, R. (2007). Ownership concentration and corporate governance practices: Substitution or expropriation effects? *Canadian Journal of Administrative Sciences/Revue Canadienne Des Sciences de l'Administration*, 24(3), 182-195. <https://doi.org/10.1002/cjas.23>
18. Brammer, S., Millington, A., & Pavelin, S. (2007). Gender and ethnic diversity among UK corporate boards. *Corporate Governance: An International Review*, 15(2), 393-403. <https://doi.org/10.1111/j.1467-8683.2007.00569.x>
19. Brieger, S. A., Francoeur, C., Welzel, C., & Ben-Amar, W. (2019). Empowering women: The role of emancipative forces in board gender diversity. *Journal of Business Ethics*, 155(2), 495-511. <https://doi.org/10.1007/s10551-017-3489-3>
20. Cameron, C., & Pravin, P. K. (2010). *Stata bookstore: Microeconometrics using stata* (Rev. ed.). College Station, TX: Stata Press.
21. Campbell, K., & Mínguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics*, 83, 435-451. <https://doi.org/10.1007/s10551-007-9630-y>
22. Carter, D. A., Simkins, B. J., & Simpson, W. G. (2003). Corporate governance, board diversity, and firm value. *Financial Review*, 38(1), 33-53. <https://doi.org/10.1111/1540-6288.00034>
23. Catalyst. (2015, January). *Report: 2014 Catalyst census: Women board directors*. Retrieved from <https://www.catalyst.org/research/2014-catalyst-census-women-board-directors/>
24. Charness, G., & Gneezy, U. (2012). Strong evidence for gender differences in risk taking. *Journal of Economic Behavior & Organization*, 83(1), 50-58. <https://doi.org/10.1016/j.jebo.2011.06.007>
25. Claessens, S., Djankov, S., Fan, J. P., & Lang, L. H. (2002). Disentangling the incentive and entrenchment effects of large shareholdings. *The Journal of Finance*, 57(6), 2741-2771. <https://doi.org/10.1111/1540-6261.00511>
26. Coles, J. L., Lemmon, M. L., & Wang, Y. A. (2008). The joint determinants of managerial ownership, board independence, and firm performance. Paper presented at the *Second Singapore International Conference on Finance*. <http://doi.org/10.2139/ssrn.1089758>
27. Cosh, A., Guest, P. M., & Hughes, A. (2006). Board share-ownership and takeover performance. *Journal of Business Finance & Accounting*, 33(3-4), 459-510. <https://doi.org/10.1111/j.1468-5957.2006.00615.x>
28. Craswell, A. T., Taylor, S. L., & Saywell, R. A. (1997). Ownership structure and corporate performance: Australian evidence. *Pacific-Basin Finance Journal*, 5(3), 301-323. [https://doi.org/10.1016/S0927-538X\(96\)00028-5](https://doi.org/10.1016/S0927-538X(96)00028-5)
29. Cumming, D., Leung, T. Y., & Rui, O. (2015). Gender diversity and securities fraud. *Academy of Management Journal*, 58(5), 1572-1593. <https://doi.org/10.5465/amj.2013.0750>
30. Daniels, R., & Morck, R. (1995). *La prise de décision dans les entreprises au Canada*. Calgary, Canada: University of Calgary Press.
31. Davidson, W. N., & Rowe, W. (2004). Intertemporal endogeneity in board composition and financial performance. *Corporate Ownership and Control*, 1(4), 49-60. <https://doi.org/10.22495/cocv1i4p4>
32. de Cabo, R. M., Gimeno, R., & Nieto, M. J. (2012). Gender diversity on European banks' boards of directors. *Journal of Business Ethics*, 109(2), 145-162. <https://doi.org/10.1007/s10551-011-1112-6>
33. Delgado-Piña, M. I., Rodríguez-Ruiz, Ó., Rodríguez-Duarte, A., & Sastre-Castillo, M. Á. (2020). Gender diversity in Spanish banks: Trickle-down and productivity effects. *Sustainability*, 12(5), 2113. <https://doi.org/10.3390/su12052113>
34. Dinh, T., Schultze, W., List, T., & Zbiegły, N. (2020). R&D disclosures and capitalization under IAS 38 - Evidence on the interplay between National Institutional Regulations and IFRS adoption. *Journal of International Accounting Research*, 19(1), 29-55. <https://doi.org/10.2308/jiar-17-522>
35. Eckel, C. C., & Grossman, P. J. (2008). Men, women and risk aversion: Experimental evidence. In *Handbook of experimental economics results* (Chapter 13, pp. 1061-1073). [https://doi.org/10.1016/S1574-0722\(07\)00113-8](https://doi.org/10.1016/S1574-0722(07)00113-8)
36. Esteban-Salvador, M. L. (2011). Variables influencing the gender composition of boards: The Spanish evidence. *Journal of Women, Politics & Policy*, 32(4), 305-332. <https://doi.org/10.1080/1554477X.2011.613733>
37. Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *The Journal of Law and Economics*, 26(2), 301-325. <https://doi.org/10.1086/467037>
38. Fraile, I. A., & Fradejas, N. A. (2014). Ownership structure and board composition in a high ownership concentration context. *European Management Journal*, 32(4), 646-657. <https://doi.org/10.1016/j.emj.2013.10.003>
39. Geiger, S. W., & Marlin, D. (2012). The relationship between organizational/board characteristics and the extent of female representation on corporate boards. *Journal of Managerial Issues*, 24(2), 157-172.
40. Gnan, L., Montemerlo, D., & Huse, M. (2015). Governance systems in family SMEs: The substitution effects between family councils and corporate governance mechanisms. *Journal of Small Business Management*, 53(2), 355-381. <https://doi.org/10.1111/jsbm.12070>
41. Green, C. P., & HomRoy, S. (2017). *Female directors, board committees and firm performance*. <https://doi.org/10.2139/ssrn.2879462>
42. Guo, L., & Masulis, R. W. (2015). Board structure and monitoring: New evidence from CEO turnovers. *The Review of Financial Studies*, 28(10), 2770-2811. <https://doi.org/10.1093/rfs/hhv038>
43. Harrison, J. R. (1987). The strategic use of corporate board committees. *California Management Review*, 30(1), 109-125. <https://doi.org/10.2307/41165269>

44. Hermalin, B. E., & Weisbach, M. S. (1998). Endogenously chosen boards of directors and their monitoring of the CEO. *The American Economic Review*, 88(1), 96-118. Retrieved from <https://www.jstor.org/stable/116820>
45. Hillman, A. J., Shropshire, C., & Cannella, A. A., Jr. (2007). Organizational predictors of women on corporate boards. *Academy of Management Journal*, 50(4), 941-952. <https://doi.org/10.5465/amj.2007.26279222>
46. Howton, S. D., Howton, S. W., & Olson, G. T. (2001). Board ownership and IPO returns. *Journal of Economics and Finance*, 25(1), 100-114. <https://doi.org/10.1007/BF02759689>
47. Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, 76(2), 323-329. Retrieved from <https://www.jstor.org/stable/1818789>
48. Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance*, 48(3), 831-880. <https://doi.org/10.1111/j.1540-6261.1993.tb04022.x>
49. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
50. Jianakoplos, N. A., & Bernasek, A. (1998). Are women more risk averse? *Economic Inquiry*, 36(4), 620-630. <https://doi.org/10.1111/j.1465-7295.1998.tb01740.x>
51. Jiang, F., Kim, K., Nofsinger, J. R., & Zhu, B. (2017). A pecking order of shareholder structure. *Journal of Corporate Finance*, 44(C), 1-14. <https://doi.org/10.1016/j.jcorpfin.2017.03.002>
52. Jones, T. M., & Gautschi, F. H. (1988). Will the ethics of business change? A survey of future executives. *Journal of Business Ethics*, 7(4), 231-248. <https://doi.org/10.1007/BF00381827>
53. Kaplan, S. N., & Minton, B. A. (1994). Appointments of outsiders to Japanese boards: Determinants and implications for managers. *Journal of Financial Economics*, 36(2), 225-258. [https://doi.org/10.1016/0304-405X\(94\)90025-6](https://doi.org/10.1016/0304-405X(94)90025-6)
54. Kim, K. A., Kitsabunnarat-Chatjuthamard, P., & Nofsinger, J. R. (2007). Large shareholders, board independence, and minority shareholder rights: Evidence from Europe. *Journal of Corporate Finance*, 13(5), 859-880. <https://doi.org/10.1016/j.jcorpfin.2007.09.001>
55. Knippen, J. M., Shen, W., & Zhu, Q. (2019). Limited progress? The effect of external pressure for board gender diversity on the increase of female directors. *Strategic Management Journal*, 40(7), 1123-1150. <https://doi.org/10.1002/smj.3014>
56. La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2000). Investor protection and corporate governance. *Journal of Financial Economics*, 58(1-2), 3-27. [https://doi.org/10.1016/S0304-405X\(00\)00065-9](https://doi.org/10.1016/S0304-405X(00)00065-9)
57. Lee, W.-M. (2020). The determinants and effects of board committees. *Journal of Corporate Finance*. Advance online publication. <https://doi.org/10.2139/ssrn.3530217>
58. Lennox, C. (2005). Management ownership and audit firm size. *Contemporary Accounting Research*, 22(1), 205-227. <https://doi.org/10.1506/K2CG-U6V0-NPTC-EQBK>
59. Li, K., & McNally, W. J. (1999). *Information signaling or agency conflicts: What explains Canadian open market share repurchases?* (University of British Columbia, Finance Working Paper No. 97-13). <https://doi.org/10.2139/SSRN.149514>
60. Linck, J. S., Netter, J. M., & Yang, T. (2008). The determinants of board structure. *Journal of Financial Economics*, 87(2), 308-328. <https://doi.org/10.1016/j.jfineco.2007.03.004>
61. Mallette, P., & Fowler, K. L. (1992). Effects of board composition and stock ownership on the adoption of "poison pills". *Academy of Management Journal*, 35(5), 1010-1035. <https://doi.org/10.5465/256538>
62. McCabe, A. C., Ingram, R., & Dato-on, M. C. (2006). The business of ethics and gender. *Journal of Business Ethics*, 64(2), 101-116. <https://doi.org/10.1007/s10551-005-3327-x>
63. McConnell, J. J., & Servaes, H. (1990). Additional evidence on equity ownership and corporate value. *Journal of Financial Economics*, 27(2), 595-612. [https://doi.org/10.1016/0304-405X\(90\)90069-C](https://doi.org/10.1016/0304-405X(90)90069-C)
64. Morck, R., Shleifer, A., & Vishny, R. W. (1988). Management ownership and market valuation. *Journal of Financial Economics*, 20, 293-315. [https://doi.org/10.1016/0304-405X\(88\)90048-7](https://doi.org/10.1016/0304-405X(88)90048-7)
65. Nekhili, M., & Gatfaoui, H. (2013). Are demographic attributes and firm characteristics drivers of gender diversity? Investigating women's positions on French boards of directors. *Journal of Business Ethics*, 118(2), 227-249. <https://doi.org/10.1007/s10551-012-1576-z>
66. Ng, K. X. (2007). *Inside the boardroom: A proposal to Delaware's good faith jurisprudence to improve board passivity* (Yale Law School, Student Scholarship Papers No. 6). Retrieved from [https://digitalcommons.law.yale.edu/student\\_papers/56](https://digitalcommons.law.yale.edu/student_papers/56)
67. Nguyen, H., & Faff, R. (2007). Impact of board size and board diversity on firm value: Australian evidence. *Corporate Ownership and Control*, 4(2), 24-32. <https://doi.org/10.22495/cocv4i2p2>
68. Olsen, R. A., & Cox, C. M. (2001). The influence of gender on the perception and response to investment risk: The case of professional investors. *The Journal of Psychology and Financial Markets*, 2(1), 29-36. [https://doi.org/10.1207/S15327760JPFM0201\\_3](https://doi.org/10.1207/S15327760JPFM0201_3)
69. Peasnell, K. V., Pope, P. F., & Young, S. (2003). Managerial equity ownership and the demand for outside directors. *European Financial Management*, 9(2), 231-250. <https://doi.org/10.1111/1468-036X.00217>
70. Peterson, R. A., Beltramini, R. F., & Kozmetsky, G. (1991). Concerns of college students regarding business ethics: A replication. *Journal of Business Ethics*, 10(10), 733-738. <https://doi.org/10.1007/BF00705707>
71. Post, C., & Byron, K. (2015). Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal*, 58(5), 1546-1571. <https://doi.org/10.5465/amj.2013.0319>
72. Rakestraw, J. R. (2020). Investor protection and the substitution effect of corporate governance and product market competition on firm value. *Journal of Accounting, Auditing & Finance*. <https://doi.org/10.1177/0148558X20936792>
73. Rakoto, P. (2016). Financial reporting quality, executive stock options and business ethics. *GSTF Journal on Business Review (GBR)*, 4(2), 99-105. <https://doi.org/10.7603/s40706-015-0024-3>
74. Rediker, K. J., & Seth, A. (1995). Boards of directors and substitution effects of alternative governance mechanisms. *Strategic Management Journal*, 16(2), 85-99. <https://doi.org/10.1002/smj.4250160202>
75. Sargan, J. D. (1958). The estimation of economic relationships using instrumental variables. *Econometrica: Journal of the Econometric Society*, 26(3), 393-415. <https://doi.org/10.2307/1907619>
76. Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. *Journal of Political Economy*, 94(3, Part 1), 461-488. <https://doi.org/10.1086/261385>

77. Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, 52(2), 737-783. <https://doi.org/10.2307/2329497>
78. Sila, V., Gonzalez, A., & Hagendorff, J. (2016). Women on board: Does boardroom gender diversity affect firm risk? *Journal of Corporate Finance*, 36, 26-53. <https://doi.org/10.1016/j.jcorpfin.2015.10.003>
79. Tinker, T., & Okcabol, F. (1991). Fatal attractions in the agency relationship. *The British Accounting Review*, 23(4), 329-354. [https://doi.org/10.1016/0890-8389\(91\)90067-C](https://doi.org/10.1016/0890-8389(91)90067-C)
80. Tulung, J. E., & Ramdani, D. (2018). Independence, size and performance of the board: An emerging market research. *Corporate Ownership & Control*, 15(2-1), 201-208. <https://doi.org/10.22495/cocv15i2c1p6>
81. Ullah, S., Akhtar, P., & Zaefarian, G. (2018). Dealing with endogeneity bias: The generalized method of moments (GMM) for panel data. *Industrial Marketing Management*, 71, 69-78. <https://doi.org/10.1016/j.indmarman.2017.11.010>
82. Uribe-Bohorquez, M.-V., Martínez-Ferrero, J., & García-Sánchez, I.-M. (2018). Board independence and firm performance: The moderating effect of institutional context. *Journal of Business Research*, 88, 28-43. <https://doi.org/10.1016/j.jbusres.2018.03.005>
83. Velte, P. (2016). Women on management board and ESG performance. *Journal of Global Responsibility*, 7(1), 98-109. <https://doi.org/10.1108/JGR-01-2016-0001>
84. Villalonga, B., & Amit, R. (2006). How do family ownership, control and management affect firm value? *Journal of Financial Economics*, 80(2), 385-417. <https://doi.org/10.1016/j.jfineco.2004.12.005>
85. Vishwakarma, R. (2017). Women on board and its impact on performance: Evidence from microfinance sector. *Indian Journal of Corporate Governance*, 10(1), 58-73. <https://doi.org/10.1177/0974686217701465>
86. Zaichkowsky, J. L. (2014). Women in the board room: One can make a difference. *International Journal of Business Governance and Ethics*, 9(1), 91-113. <https://doi.org/10.1504/IJBGE.2014.062774>