

**POWER IN NUMBERS: HOW ATTAINING A CRITICAL MASS OF WOMEN ON
CORPORATE BOARDS IMPACTS FIRM FINANCIAL PERFORMANCE**

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ABSTRACT

Power in numbers: How attaining a critical mass of women on corporate boards impacts firm financial performance

Alexandra Calderone

This paper investigates the association between gender composition of board members and firm financial performance in Canadian companies listed on the Toronto Stock Exchange (TSX).

Through the conceptual lenses of tokenism and critical mass theories, our study provides new insights into the relationship of board gender diversity and performance by adding an important but overlooked moderating variable, notably the effect of firm size. We use data from 235 Canadian firms across 11 industry sectors for the period of 2019. The results demonstrate that large sized firms with at least 30% of women on the board of directors are likely to outperform their competition, as measured by Tobin's Q. Through this study, we make a theoretical contribution to the literature by expanding upon the tokenism and critical mass theories. Practitioners will also gain deeper insights on how the role of women on corporate boards can impact performance for their respective firms.

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1. INTRODUCTION

Despite the enduring under-representation of women in the boardroom compared to their male counterparts, there have been considerable efforts to reduce this gender gap in recent years. In 2007, women held a meager 14.8% of board seats on Fortune 500 listed companies in the United States – with an even smaller representation in Canada at 10.6% (Adams & Ferreira, 2009). One decade later, in 2016, the representation of females on boards in Canada nearly doubled and women accounted for 19.4% of directors (Statistics Canada, 2019). Part of this is the result of governance reforms across Western countries aimed at promoting gender diversity and female leadership in firms. For example, Norway imposed a strict gender quota in 2008 whereby all publicly listed companies were mandated to have a minimum of 40% female participation rate on the board of directors. This was the first country to enforce mandatory quotas and serious sanctions for firms that do not comply with the regulations, including dissolution (Leszczyńska, 2017). Academics are increasingly interested in the effects of these reforms and policies (Bennouri et al., 2018; Torchia et al., 2011; Carter et al., 2003).

However, despite this growing importance of gender diversity, the results on performance are varied. Certain studies find positive or improved firm performance (Lückerath-Rovers, 2013; Campbell & Minguez-Vera, 2008; Terjesen et al., 2016; Carter et al., 2003), whereas others find negative performance outcomes (Adams & Ferreira, 2009; Bøhren & Strøm, 2010; Minguez-Vera & Martin, 2011), or even non-existent relationships (Pletzer et al., 2015; Carter et al., 2010). Similarly, a meta-analysis consolidated 140 empirical articles to investigate this exact relationship between women on boards and firm financial performance, and concluded that the results are in fact decidedly mixed (Post & Byron, 2015). This large variability in results can be

caused by differences across studies in terms of performance measurements, methodology, time horizons, sampling, contextual issues and omitted variable biases (Adams et al., 2015). In order to mitigate these conflicting results and to move the field further, we require "further investigation of board gender diversity-firm outcome relationships" (Adams et al., 2015, p.80). With that, researchers have suggested considering moderating or mediating variables between the relationship of board gender diversity and corporate performance to determine whether this would impact the model (Miller & del Carmen Triana, 2009).

From a theoretical perspective, the mixed results obtained through prior research on the diversity-performance relationship could be explained, at least partially, by the lack of consideration for token representation of female directors. Most corporate boards have limited female representation a phenomenon of *tokenism*, as defined by Kanter in 1977, to understand the dynamics of a boardroom composed with a minority group of women among a majority group of men. Tokenism arises when few women are recruited to male dominated groups in order to give the appearance of gender equality. As such, it is important to explore the effects that *size of minority groups* of women on boards can have on firm performance because this area is under-researched (Terjesen et al., 2009). Therefore, the main contribution of this paper will be to investigate the critical mass theory, by considering *how many* females are sitting at the table, as the number or percentage of women holding board seats can greatly influence the nature of their impact. The nature of a board's composition is of great value to organizations, because the role of the board of directors is to monitor and advise top management teams and managers. The opinions of individual directors are helpful on providing counsel to strategic matters in line with their particular areas of expertise (Chitayat, 1984). Hence, directors' "demographic, human capital and social capital attributes affect board effectiveness and firm performance" (Bennouri

et al., 2018, p.268). This paper will specifically address whether the effects of tokenism impact the ways in which women are able to contribute to firm performance. Our research question is as follows: *How does firm size affect the relationship between women on boards and performance?*

Furthermore, the literature on tokenism has seldom been used to explain the relationship between gender diversity on corporate boards and performance. In this regard, this paper will aim to extend a study by Li & Chen (2018), and investigate whether board gender diversity and firm performance is *moderated* by firm size, by observing through the lens of tokenism. Including a moderator (firm size) and an added theoretical framework (tokenism) will extend the previous research on this topic. It can be argued that a firm's size "is a key factor explaining board dynamics and structures" (Cashman et al., 2012, p.3251) and may have multiple effects on performance outcomes. For instance, firm size indicates the ease of accessibility to resources and capital which can facilitate or restrain corporate business activities. It also indicates the level of reputational status that a firm is expected to uphold in the eyes of their stakeholders (Fombrun & Shanley, 1990). These factors pose their unique challenges to the oversight of board members (Pugh et al., 1969). Therefore, our study will provide an empirical analysis on how women on corporate boards impact firm performance and whether firm size alters the relationship in any way.

This paper investigates the relationship between gender diversity and corporate performance using a large sample of 235 Canadian companies. The selection of Canada as the country of choice is due to their boost in the number of women in board seats. According to a new report from Catalyst and the 30% Club of Canada, the country is experiencing encouraging progress for female representation on boards and executive teams (Beck, 2020). For this reason,

there is a sufficient number of companies where gender diversity representation is observed beyond the point of tokenism, thus enabling us to select enough qualifying companies to satisfy our independent variable. Furthermore, though the research on this topic has been performed cross-culturally, the literature pointing to North America is heavily concentrated on US-based firms rather than Canadian-based firms (Francoeur et al., 2007). As for our variables, we considered Tobin's Q as the measure for firm performance of the publicly-traded companies in our sample. In addition, our measure of gender diversity is based on a percentage that follows Kanter's critical mass theory. The independent variable will compare firms that uphold over 30% of women on their boards versus those that fall below this critical mass percentage. This paper will also assess whether firm size alters the diversity-performance relationship by including size as a moderator.

The principal findings of this empirical analysis suggest that firm size alters the relationship between gender diversity on corporate boards and performance; a critical mass of women on the corporate boards is associated with a positive impact on firm performance. Furthermore, this study will make a theoretical contribution to the literature on tokenism and critical mass at the board level by investigating whether organizational size is a factor that influences whether a critical mass of women directors will affect performance outcomes. Another contribution of this paper is to advance the literature on firm size to investigate whether there are any gender implications. For instance, is there a reason why larger firms would be more inclined to hire minority representation to their leadership teams?

2. LITERATURE REVIEW

2.1 Board Gender Diversity & Performance

On one hand, researchers argue that including women on corporate boards can be an asset toward decision making and performance outcomes due to the social and behavioral diversity women would add to male dominated groups. Women bring different sets of experiences, knowledge, cognitive frames and values which adds depth to the discussion and allows for a more well-rounded understanding of various stakeholders (Carpenter, 2002). The main argument supporting the business case for improving diversity in corporate governance is that heterogeneous teams produce creative solutions to solve complex business problems, and report superior critical thinking capability than homogeneous teams (Hoffman & Maier, 1961). Heterogeneous groups also exhibit “different points of view and knowledge, consider more comprehensive set of solutions and debate other’s viewpoints more vigorously, leading to higher quality decisions” (Dezso & Ross, 2012, p.1075).

Accordingly, research shows that having increased female representation on corporate boards enhances leadership effectiveness (Robinson & Dechant, 1997) by encouraging strong attendance behavior from other board members (Adams & Ferreira, 2009), fostering team collaboration (Bear & Woolley, 2011) and lowering CEO turnover-performance sensitivities (Kim et al., 2020). These positive impacts on leadership can trickle-down into other facets of the organization, like promoting greater firm innovation capability (Torchia et al., 2011) or even promoting greater corporate sustainability-related firm actions (Zaid et al., 2019). Many studies also show evidence of positive relationships between women on boards and firm financial performance (Sabatier, 2015; Lücknerath-Rovers, 2013; Campbell & Minguéz-Vera, 2008). For example, research by Carter et al., (2003) investigates the relationship among corporate

governance, board diversity and firm value of 797 publicly traded Fortune 1000 firms in the United States and finds a statistically significant positive relationship between the presence of women on boards and firm value as measured by Tobin's Q. Moreover, Terjesen et al. (2016) examines public firms in 47 countries to determine if the presence of female directors enhances performance. This multi-country study extends prior research on this topic by collecting data points from developed countries all around the globe, and finds a significantly positive relationship between firms that have more female directors and increased performance from both a financial and accounting perspective.

On the other hand, some research considers diversity a double-edged sword by demonstrating possible negative outcomes. For instance, there can be social categorisation tendencies within homogeneous groups which create 'in groups' and 'out groups' (Tajfel, 1978). When this occurs, it can compromise the team's alignment and create intragroup barriers (Blau, 1977). If these issues arise in the context of a corporate boardroom, it can impair communication and co-operation among subgroups, thereby leading to increased conflict (Pletzer et al., 2015). In turn, this can hinder the board's decision-making processes and decrease firm performance (Kyereboah-Coleman, 2006). Certain studies pertaining to gender diversity on boards yield negative results on firm performance (Adams & Ferreira, 2009; Bøhren & Strøm, 2010; Yu & Madison, 2021). For example, a study by Mínguez-Vera & Martin (2011) analyzed the presence of women on boards within a sample of Spanish SMEs (Small and Medium Sized Enterprises). The results found that adding women to boards of Spanish SMEs did not improve performance, mainly due to the risk averse traits of females – they adopted less risky policies and strategies which negatively impacted performance. These findings are consistent with a study by Bøhren & Strøm (2010), which finds that Norwegian firms create more value when board gender diversity

is low. Further, evidence from research conducted in the United States shows that shareholders respond unfavorably to female appointments on corporate boards, thereby driving negative stock market reactions and negatively impacting performance. According to the article, the signaling effect of adding women to senior positions is perceived as having a weaker commitment to shareholder value (Solal & Snellman, 2019).

A third stream of research finds no relationship between gender-diverse boards and corporate performance. For instance, a meta-analysis of 20 empirical studies found no association between the percentage of women on boards of directors and firm performance, regardless of country characteristics (Pletzer et al., 2015). Consistent results are established in the Rose (2007) article, whereby no significant link is found between firm performance as measured by Tobin's Q and female board representation within a sample of Danish firms.

One reason to explain these mixed results is because we cannot only account for the number or percentage of women on boards, but rather the *threshold percentage* of women occupying these board seats. Once you obtain a threshold of women that is influential among the dominant male group this might mitigate the negative 'in group' versus 'out group' diversity effects, and improve the nature of the board interactions as a whole. In fact, certain meta-analysis papers find that there are persisting limitations within studies on this topic, whereby "less than a handful of studies measure female representation as a critical mass [...] and we hope that researchers will continue to examine whether female directors have greater influence in conditions when their appointments do not represent tokenism" (Post & Byron, 2015, p.1562). Therefore, due to conflicting empirical evidence on the relationship between board gender diversity and performance, we will aim to further investigate this topic from a different angle by

addressing the underlying theme of tokenism and critical mass. Accordingly, this call to action motivates our reasoning for introducing tokenism and critical mass theory within this paper.

2.2 Tokenism & Critical Mass Theory

Despite persistent efforts to achieve equality in the corporate world, men still dominate corporate board seats and senior executive teams (Pletzer et al., 2015). This lack of gender representation in boardrooms can marginalize women and undermine their voices or opinions among the male dominated group – women become *tokens*. In this regard,

a token group is a subgroup, which represents less than 15 percent of the overall work group that is perceived to be different from the rest of the group. In these skewed groups, the larger portion of the group (representing at least 85 percent of the work group) is labeled “dominants” whereas the less represented members of the group (representing less than 15 percent) are identified as “tokens” (Stichman et al., 2010, p.633).

In this case, tokenism can be used to describe a female’s position in a firm’s leadership role based on their need for a “token” representation of the female gender (Adams & Ferreira, 2009). According to authors Adams & Ferreira, having only one female on the board of directors is often regarded as evidence of tokenism. There are many reasons why tokenism is problematic, including that tokens are prevented from having an actual impact on corporate outcomes due to minority representation. This danger was mentioned in a study conducted by Post et al. (2015), in which they suggested that “when women are in the numerical minority in a group, there is a serious risk that their voices and values will not be heard or taken into account” (Post et al., 2015, p.425). This accurately explains how minority groups are often marginalized, having little

bearing on decision making or having difficulty establishing credibility (Post & Byron, 2015). Moreover, because tokens are highly visible, this might create undue performance pressures for those in the minority subgroup which can be detrimental to their success (Powell & Graves, 2003). Accordingly, a token individual's performance "is likely to affect not only his or her own personal advancement but also the future acceptability of other members of the minority group. This creates performance demands which may be met by overachieving. On the other hand, the token person may be encouraged to allay the resentment and fears about competition by performing at a relatively low, nonthreatening levels." (Spangler et al., 1978, p.161).

Therefore, to mitigate risk and reduce the possibility of lending factors of tokenism into research studies, organizations may require critical mass, where the "size of the minority group increases to the point that it is no longer a token minority" (Torchia et al., 2011, p.301). When the size of the minority group grows in numbers, this strengthens the group's degree of influence. Essentially, "women's ability to influence board decisions *increases with their numbers*" (Fondas & Sasselos, 2000, p.15). At the point of attaining critical mass, women can begin to affect the previously male-dominated environments. The article by Torchia et al. (2011) evaluates the relationship between the critical mass of female directors and the level of firm innovation. In doing so, the authors test the independent variable based on firms with few tokens (1 or 2 women on corporate boards) versus firms with a consistent majority or critical mass (at least 3 women on corporate boards). The results suggest that attaining a critical mass of females on boards positively impacts firm innovation. Similarly, a study of 151 listed German firms finds that gender diversity negatively affects performance up until the point at which critical mass is attained. When setting up their study, the authors classified the independent variable into 4 distinct categories according to the percentage of female board members; *uniform* groups (only

men), *skewed* groups (<20 % females), *tilted* groups (20-40% females), and *balanced* groups (>40% females). The results find the relationship between gender diversity on corporate boards and ROE to be U-shaped, whereby once a firm achieves between 20-40% of female board members (*tilted* groups), they outperform firms with completely male boards (*uniform* groups) (Joecks et al., 2013). Garanina & Murayev (2021) also suggest a positive effect of gender diversity on performance when appointing at least 3 women to corporate boards, whereas these same findings do not apply when there is only one woman appointed to the board. These results motivate our forthcoming hypothesis:

Hypothesis 1: Consistent with critical mass theory, firms that have at least 30% females on their corporate boards will outperform firms who do not meet this threshold.

2.3 Firm Size as a Moderator

Though the relationship between gender diversity in the boardroom and firm performance has been widely studied in academia, there is limited research on whether firm size mitigates this relationship. Prior studies merely include firm size as a control variable (Lückerath-Rovers, 2013; Campbell & Minguez-Vera, 2008; Rose, 2007). For this paper, we will investigate whether the variation of firm size acts as a moderating factor.

On one hand, large organizations have greater financial and technical capabilities due to economies of scale and scope (Damanpour, 2010), and are perceived as having more legitimacy (Arnegger et al., 2014). The larger and more visible the firm; the more they are faced with external public pressures, or public “scrutiny”. In general, this scrutiny comes from the media, shareholders, business constituents, policymakers, social media, etc., and can create additional performance pressures (Fombrun & Shanley, 1990). Therefore, organizations must be aware of

the attention they are receiving from the public in order to avoid any *negative* scrutiny. To do so, these organizations engage in impression management strategies whereby they attempt to control the narrative and positively shape how they are perceived by stakeholders (Elsbach & Sutton, 1992). They are also more inclined to partake in legitimacy-enhancing behaviors such as engaging in respectful activities or socially responsible practices (Cowen et al., 1987). Thus, some researchers have found a positive relationship between firm size and corporate social responsibility initiatives (CSR). For example, a study by Muller & Kolk (2010) investigates how extrinsic and intrinsic drivers impact corporate social performance (CSP) using a sample of 121 firms in Mexico. The aim of the research is to find how management commitments to ethics vary among foreign and domestic firms and the findings show that firm size is an important predictor of CSP. Large firms are highly visible which increases extrinsic pressures for them to implement ethical initiatives (Muller & Kolk, 2010).

A similar logic can apply to large, and highly visible firms, who decide to improve their impression management by increasing diversity representation. A study of 1500 S&P boards investigates the motive for companies to appoint more underrepresented populations (e.g. racial minorities, women, etc.) to corporate boards of directors in the United States. The research performed across four experiments and one field study shows that US corporate boards are likely to adhere to social norms by including up to an average of 2 female directors to their board. The motivation for hiring females to these positions is enhanced for firms that are more visible (larger firms), and “these effects are driven in part by scrutiny and impression management motives” that can be achieved by supporting diversity initiatives (Chang et al., 2019, p.165). As such, further research has determined that “the critical percentage of about 30 % women on the board translates into an absolute critical mass of on average three women”, which corresponds to

the “magic number” of women represented in the boardroom (Joecks et al., 2013, p.68). Similarly, research conducted in Spain examines the relationship between having female directors and how that influences a firm’s corporate reputation. The results from this study show that companies that include 3 or more women to their boards enjoy significantly enhanced corporate reputation advantages according to public perception. Hence, the presence of women in leadership signals to stakeholders that the company is committed to the advancement of gender diversity (Carlos et al., 2020).

On the other hand, smaller firms are less likely to see the reputational advantages that go along with increasing diversity representation, “because they have a low visibility and face both low public scrutiny and the lack of attention from external stakeholders and the media” (Godos-Díez et al., 2020, p.110). That said, larger firms are more incentivized to use their many resources in order to improve public perception or satisfy social expectations of society by; promoting gender equity in the boardroom and further investing in the success of those women. In doing so, these larger firms will be complying with the expectations set by the external environment (stakeholders, investors, etc.) to increase DEI initiatives by appointing more women on boards. By meeting these expectations, firms can expect to be rewarded with additional investors or increased stock price valuation which are both associated with increased firm performance. Moreover, their investment in female talent “can help develop specialised skills which lead to firm-specific *economic benefits* for companies” (Godos-Diez et al., 2020, p.110). In accordance with this reasoning, we propose the following hypothesis:

Hypothesis 2: A larger firm size will positively moderate the relationship of women on corporate boards and firm performance.

3. METHODS & DATA

3.1 Sample

The sample for the empirical analysis is comprised of 235 Canadian firms listed on the Toronto Stock Exchange (TSX). The companies in this sample represent approximately 95% of the entire Canadian equities market and are included within the S&P/TSX Capped Composite Index ETF (XIC) as of December 31, 2019 (S&P Dow Jones, 2022). These selected firms span across 11 different industry sectors, including; financial, industrial, energy, communication, information technology, consumer staples, materials, consumer discretionary, real estate, utilities and health care. The only selection criterion considered for this sample was that the firm must have data available on Bloomberg at the time of data collection. We removed data points from our sample if they had missing or inconsistent values, or if they had significant outliers that may influence our results. The final sample was narrowed down to 209 firm-year observations from 2019.

3.2 Variables

3.2.1 Dependent Variable

To measure our dependent variable, firm performance, we followed the same approach used in recent studies (Terjesen et al., 2016; Rose, 2007; Carter et al., 2010) by using the most common market-based metric, Tobin's Q. Tobin's Q is measured as "the sum of the market value of equity plus the book value of debt divided by the total book value of assets, and captures market expectations regarding a company's future profitability" (Yu & Madison, 2021, p.381). The reason for using a market-based approach, rather than an accounting-based approach, is because it reflects the expectations of shareholders and investors on a given company's long-term or future financial performance. In other words, the Tobin's Q ratio estimates whether a

business is overvalued or undervalued compared to other firms in the market. Data used for the Tobin's Q ratio was accessible through the Bloomberg Professional Services Terminal, as it provides accurate real-time data for global financial markets.

3.2.2 Independent Variable

Consistent with prior studies, we measure our independent variable, gender diversity on the board of directors, as a *percentage* of female directors on the board (Kyaw, Olugbode, & Petracci, 2017; Biswas et al., 2018; Adams & Ferreira, 2009). The data on board gender diversity for each firm was obtained through archival data from the Catalyst report, *Women in Leadership at S&P/TSX Companies* (Catalyst, 2020). Catalyst is a non-profit organization that undertakes research about gender balance at the board level and at senior management levels. Many of their research reports are released to the public and are often cited in academic literature on corporate governance (Lückerath-Rovers, 2013; Francoeur et al. 2007). The data presented in the *Women in Leadership at S&P/TSX Companies* Catalyst report, offered a list of Canadian companies that have achieved a threshold of at least 30% or more women on boards as of December 2019. For this study, the variable, gender diversity on the board, is expressed by this proportion of female directors; if the firm has 30% or more female directors on the board the dummy variable equals 1, otherwise 0.

3.2.3 Moderation Variable

The moderating variable, firm size, was also measured by using archival data collected from the Bloomberg database. Similar to other studies that use this variable in their research (Lückerath-Rovers, 2013; Campbell & Minguez-Vera, 2008; Li & Chen, 2018), we compute

firm size as the natural logarithm of the book-value of year-end total assets to determine whether there is an interaction effect between gender diversity on boards and organization size.

3.2.4 Control Variable

In line with prior studies (Bennouri et al., 2018; Campbell & Minguez-Vera, 2008) we use leverage as a firm-level control variable, which is computed as the ratio of total financial debt to total assets.

3.3 Method

All analyses for this research were conducted using IBM SPSS Statistics version 26.0, and PROCESS macro by Andrew F. Hayes version 4.0. We estimate the multivariate regression model for this research, as shown:

$$Perf_i = (b_0 + b_1 WBoD_i + b_2 Size_i + b_3 (WBoD * Size)_i) + \varepsilon_i$$

Whereby, *Perf* refers to measures of firm performance; *WBoD* refers to percentage of women on corporate boards of directors; *Size* refers to firm size; *WBoD * Size* refers to the interaction term; and *i* refers to individual firms within the sample.

3.4 Descriptive Statistics

The descriptive statistics for this paper are listed in Table 1. From the sample, Tobin's Q ranges between 0.302 to 18.62, with a mean of 1.984, which indicates that, on average, the market value of equity and book value of liabilities is 98.4% greater than the book value of total assets within our sample of firms. The representation of women on boards (WBoD) is a dummy variable with a minimum of 0.00, for firms with less than 30% women, and a maximum of 1.00,

for firms with at least 30% women. The mean 0.400 indicates that less than half of the firms in this sample (only 40%) hire over a threshold of 30% female directors to their boards. Firm size ranges from 5.31 to 14.17, with a mean of 8.8, which indicates that there is a large variety of firm sizes in the Canadian market.

Table 1. Descriptive Statistics

Variables	Mean	Std. Dev	Min.	Max.
Tobin's Q	1.984	2.169	0.302	18.62
WBoD	.400	.491	1.00	.00
Firm Size	8.800	1.722	5.31	14.17
Leverage	.292	.186	.00	.98

4. RESULTS

Table 2 summarizes the results from the hypothesis testing. We begin by evaluating the direct relationship between the percentage of women on boards and firm performance. To do so, Model 1 tested the effects of the independent variable on the dependent variable. The regression analysis shows that there is no significant association among these variables at the 95% confidence level. Hypothesis 1 is not supported, suggesting that the presence of a critical mass of 30% of women on corporate boards is significantly associated with firm performance.

In Model 2, we analyzed the interaction effect of the independent variable with the moderated variable (*Table 2*). Overall, model 2 is significant ($p = 0.0002$). Furthermore, the results show a significant and positive interaction effect, where $b=0.0603$, 95% CI [0.0056, 0.1150], $p=0.0308$ ($p<0.05$), indicating that the moderator variable, firm size, does impact the

association between women on corporate boards and performance. To interpret the moderation effect we examine the effect of firm size at various percentile levels; 16th, 50th, and 84th (Table 3). Thus, the output shows us the results at three levels: the model for presence of 30% women on corporate boards as a predictor for performance (1) when firm size is small (to be precise when the value of size is at 7.332); (2) at the mean value of firm size or when firm size is medium (8.610); and (3) when the value of firm size is large (10.488). When a firm size is small there is a non-significant negative relationship, and when a firm is medium sized, there is a non-significant positive relationship between female board members and performance. However, when firm size is large, there is a significantly positive relationship between the presence of female board members and performance ($b=.1314$, $p < 0.05$). The results tell us that the relationship of women on corporate boards and firm performance only really emerges in bigger firms.

Table 2. Regression Analyses (N= 209)

Dependent Variable: Tobin's Q		
Independent and Control Variables	Model 1 Direct Relationship	Model 2 Moderated Relationship
WBoD	.004 (.047)	-.5014** (.2531)
Firm Size		-.0838*** (.0192)

Int_WBoD*Firm Size		.0603**
		(.0277)
Leverage		.2679**
		(.1279)
Constant	.296	.9349***
	(.031)	(.1601)

Standard errors are in parentheses.

The levels of significance are * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 3. Conditional effects of focal predictor at various values of Firm Size

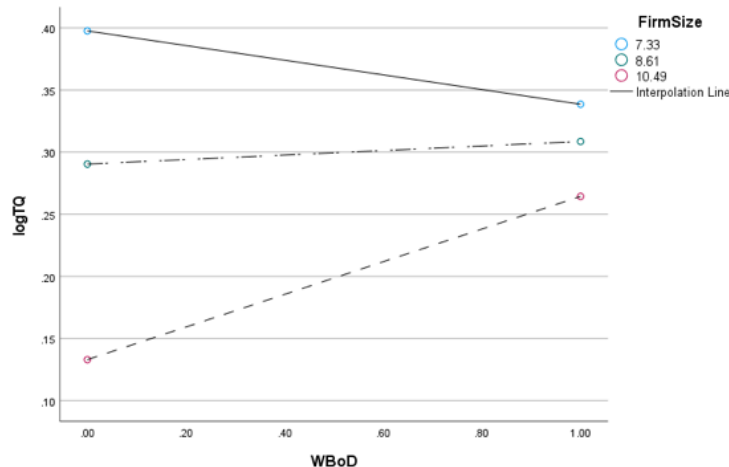
Percentile of Firm Size	Firm Size	Fixed Effect
16 th	7.332	-.059
		(.0652)
50 th	8.610	.0181
		(.0479)
84 th	10.488	.1314**
		(.0631)

Standard errors are in parentheses.

The levels of significance are * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Moreover, the simple slopes analysis (*Figure 1*) illustrates the relationship among our independent and dependent variables at small, medium and large levels of the moderator, firm size. When firm size is small (blue line) there is a non-significant negative relationship, as previously mentioned; at the mean value of firm size (green line) there is a slight positive but non-significant relationship; yet this relationship gets even stronger, and significant at the 95% confidence level, when firm size is large (red line). Furthermore, *Figure 1* depicts the log transformed value of the dependent variable, Tobin's Q. Upon back transforming the data, the results show that when a firm is large, and has fewer than 30% of women on corporate boards (WBoD = 0.00), the value of Tobin's Q is 1.32; whereas, a large firm, with at least 30% of women on corporate boards (WBoD = 1.00), has a Tobin's Q value of 1.84. This higher Tobin's Q value suggests that the market perceives the company more favourably than what their book value is stated as – the company offers additional “intangible” value to shareholders. Thus, the findings support Hypothesis 2. For our sample, gender diversity is positively associated with firm performance for companies with larger levels of firm size, and as firm size increases women continue to produce positive performance impacts.

Figure 1. Simple slopes equations of the regression of Tobin's Q on WBoD at three levels of Firm Size



5. DISCUSSION

In this study, we investigated the relationship between gender diversity in the boardroom and firm market-based performance based on the tokenism and critical mass theory. This paper also explores whether the moderating factor of firm size alters the outcome of this relationship. We tested our hypotheses using a comprehensive sample of publicly traded Canadian firms and found that (a) female representation on corporate boards, above a 30% threshold, is associated with increased firm performance (b) but only to the extent that a company is above a certain firm size. Therefore, the contribution of our paper to the literature is twofold; the first contribution is to the literature on tokenism and critical mass theory, while the second contribution is to the literature on organizational size.

Firstly, this paper makes a theoretical contribution to the literature on board gender-diversity by extending Kanter's (1977) tokenism and critical mass theory. Previous tokenism scholars have explained that token minority groups (e.g., female directors) have difficulty exerting influence and decision-making power within the larger group because they are often doubted, isolated or sometimes negatively perceived with downright derision (Maass & Clark, 1984). In particular, research indicates that "the nature of the group interactions depends upon *size*. When the size of the subgroup reaches a certain threshold, or critical mass, the subgroup's degree of influence increases" (Torchia et al., 2011, p.302). As such, prior research has examined how group size might alter the gender diversity and performance relationship by testing the moderating variable; *mean board size* (Pletzer et al., 2015; Dale-Olsen et al., 2013). Though prior studies have investigated board size, there may be an underlying factor of organizational size that influences *why* the company appoints a certain number of directors to the board. For instance, "a larger and more complicated firm may need more expertise and external resources

from its board of directors, and this requirement could lead to an increase in board size” (Ning et al., 2007, p.48). Therefore, this study investigates whether the *overall size of the organization* is an important factor in determining whether attaining a critical mass of women directors leads to performance outcomes, thereby extending our understanding of Kanter’s theory of tokenism and critical mass.

Our second contribution is to advance the literature on firm size to investigate whether there are any gender implications. It is already well established that organizational size can explain differences in how firms strategize and achieve organizational performance (Smith et al., 1986), yet gender might be an important consideration because of the unique characteristics and behavioural tendencies women bring to firm leadership, thereby impacting firm performance outcomes. As a result of increased financial performance, our study underscores the significance of having a critical mass of at least 30% women on corporate boards, especially in larger firms. In support of this new paradigm of leadership, “*large organizations*, including work organizations, governmental and political bodies as well as advocacy organizations committed to women's representation among top leadership positions would do well to focus their efforts on promoting gender diversity among decision-makers” (Cook & Glass, 2014, p.101). As mentioned, it is especially important for large organizations to promote gender equality in leadership, in part due to their visibility. Supporting women to senior leadership in large firms not only reflects favourably in the public eye (shareholders, media, policy makers, etc.), but it can also model the way for other female employees in middle or lower ranks to be motivated towards achieving their career goals. Hence, “a woman has a good reason to believe that the presence of women in top management positions is a critical factor for her likely success at the firm and adjust her commitment and motivation accordingly” (Dezso & Ross, 2012, p.1076).

The intrinsic motivation associated with possible upward mobility might incentivize female employees to continue performing highly with the intention of career advancement (e.g. climbing the corporate ladder). Therefore, the representation and visibility of women on corporate boards could have a trickle-down effect. As such, it would inspire women in the workplace to continue performing at their highest potential, and may explain why our results show a greater association between overall firm performance, and larger, more visible firms. In sum, our findings indicate that as firm size increases, so does performance, which suggests that the contribution women bring to the boardroom are more likely to be effective in larger firms.

5.1 Limitations

This study is subject to limitations, yet these limitations provide areas of opportunity for future research to explore. First, our sample is comprised of firms spanning the entire Canadian Equity market, and totals 11 different industry sectors. Though this sample is highly representative of the country's business landscape, it does not account for industry-specific effects. On one hand there may be firms "operating in industries with a short supply of potential female directors" due to the nature of the job, or slower acceptance of diversity in leadership, which has not been accounted for in our study (Post & Byron, 2015, p.1563). On the other hand, there may be industry sectors that are experiencing abnormal performance outcomes, and outperforming the stock market, regardless of factors like female director token status or firm size. For instance, at the time of data collection, at the onset of the Covid-19 pandemic, the technology sector was experiencing all-time highs. The Technology Select Sector SPDR Fund (XLK), which tracks the market's largest tech stocks was up 32%, relative to the S&P500 that was up 19% (Gurdus, 2019). As for our sample, the average total return for the S&P TSX Technology sector was 63.5%, well above the 10 other industries studied. As such, future

research should explore how the relationship of board gender diversity and firm performance might depend on the industry from which firms are measured.

Second, although this research explored how gender composition in the boardroom is associated with firm outcomes, we do not touch upon further board level characteristics. According to corporate governance literature, the relationship between diverse board characteristics and firm profitability is often linked with enhanced strategic planning and risk management capabilities (Noja et al., 2021). In part, this is due to the wider pool of social capital available when groups are mixed. Sharing various competencies and capabilities makes the group more apt to decision making and problem solving, which can impact firm performance outcomes (Milliken & Martins, 1996). For example, directors with varying interdisciplinary backgrounds or education levels could add value to the board's function. As such, the "presence of more qualified members would extend knowledge base, stimulate board members to consider other alternatives and enhance a more thoughtful processing of problems" (Bathula, 2008, p.47). Therefore, future research should delve deeper into board level characteristics, such as individual demographics (e.g. education, tenure, past experiences, independence, etc.) to determine whether this impacts the strategies or decision making processes in the boardroom (Johnson et al., 1993). In doing so, we can more specifically recognise which individual board level characteristic drive firm performance.

Lastly, our study extends on the tokenism and critical mass theory by determining if there is evidence supporting improved performance for firms with a presence of at least 30% female directors. Though it is postulated that this 30% threshold signifies 'attaining critical mass status', there are also 3 other group compositions identified by Kanter (1997a, b), including; uniform

groups (no women), skewed groups (up to 20% women), or balanced groups (more than 40% women). One might expect that given higher levels of women on boards this would result in higher effects on performance. Therefore, future research should explore how the interaction of having higher or lower representation of women on boards of directors can impact firm performance.

5.2 Practical Implications

The practical implications of our overarching findings suggest that there are considerable benefits for increasing the percentage of women on corporate boards of directors. The findings imply that firms should put in place more inclusive hiring and recruiting policies to attain more equitable gender representation in leadership roles. An effective way of starting this process is to appoint existing female board members to nominating committees, as a “good source to identify more women” and make recommendations of qualified candidates within their network (Konrad et al., 2008, p.162). Konrad et al. (2008), further suggest that by including the current generation of female directors to the recruitment process it might shed light on how improve the hiring of underrepresented demographic groups. Therefore, the traditional recruitment and selection processes must be re-visited in order to generate a more diverse array of board candidates to be considered for hire. Upholding these recruiting measures will allow firms to broaden their hiring pool, thus enabling them to find enough qualified women to satisfy the 30% critical mass threshold that is necessary to improve firm performance. Furthermore, though this study supports the ‘business case’ for large firms to hire a critical mass of women to their corporate boards, the same logic of attaining a 30% threshold might apply for hiring other minority groups as well. An additional practical implication of this study would be to hire members of racial or ethnic minority groups to corporate boards, past the point of tokenism, in order to generate positive

performance outcomes. Therefore, if faced with equally qualified candidates, businesses should consider encouraging diversity in their hiring practices.

6.0 CONCLUSION

Over the last decades, women have made major strides with regard to their participation in the Canadian labor market. Between 1976 and 2019, women increased their representation in the workplace by over 25% - from 37.6% to 47.7% (Catalyst, 2020). Despite representing nearly half of the labour force, women remain unequally represented in senior leadership positions, specifically in the boardroom. As a result of this inequity, we were prompted to research whether achieving gender balance at the board level impacts firm performance, under conditions of tokenism or critical mass. The potential applications of our findings are important considering how prominent equity, diversity and inclusion are becoming in light of today's global environment and corporate landscape. Stakeholders are beginning to demand more from companies, creating a surge in companies that are trying to adopt responsible business initiatives (Manita et al., 2017). Managers, practitioners and stakeholders can use our findings to promote the reasoning for encouraging firms to continue recruiting female participations on corporate boards. Therefore, given the results of our study, there is a call to uphold diversity representation in the boardroom because it is anchored in good business practice for large firms that are trying to improve performance outcomes. Not only is there a business case for increasing gender representation in leadership, but there is also a moral case given that women represent half of our population. As such, increasing representation of women in leadership is the right thing to do, as it allows the corporate world to level a playing field that has been tilted for so long – it promotes the case for creating both *business value* and *social value*.

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