Gender Diversity in Corporate Governance and Top Management

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ABSTRACT. This article examines whether and how the participation of women in the firm's board of directors and senior management enhances financial performance. We use the Fama and French (1992, 1993) valuation framework to take the level of risk into consideration, when comparing firm performances, whereas previous studies used either raw stock returns or accounting ratios. Our results indicate that firms operating in complex environments do generate positive and significant abnormal returns when they have a high proportion of women officers. Although the participation of women as directors does not seem to make a difference in this regard, firms with a high proportion of women in both their management and governance systems generate enough value to keep up with normal stock-market returns. These findings tend to support the policies currently being discussed or implemented in some countries and organizations to foster the advancement of women in business.

KEY WORDS: gender diversity, corporate governance, agency theory, stakeholder theory

Introduction

Capital market participants, in particular institutional investors and ethical funds, are paying closer attention to the governance and top management of listed companies. One common desideratum is to increase the representation of different stakeholders. Current reforms in Canada, the United States, and Western Europe, for instance, require that the majority of board members and all audit committee members be independent; this favors greater diversity of opinions and interests, the underlying rationale being that it should keep managerial discretion over operational and strategic decisions within proper bounds.

The objective of this article is now to examine another source of diversity in corporate governance and top management, namely that attributable to the participation of women. Over the years, the issue of gender diversity in business organizations has received increasing attention in both the academic literature and the popular press. Among other considerations, recent studies have investigated the so-called "glass ceiling effect" (Farrell and Hersch, 2001), which refers to the somewhat implicit barrier women face as they attempt to climb the corporate ladder (Li and Wearing, 2004). The presence of women on corporate boards is then considered to be the "ultimate glass ceiling" by some authors (Arfken et al., 2004). We henceforth seek to answer, from an empirical standpoint, the following questions:

- What are the characteristics or factors that lead firms to appoint more women to their board of directors or top management team?
- What is the impact of increased female representation on a firm's financial results?

This article pursues, therefore, the research stream that focuses on gender diversity or female representation in board and top-management positions (Adams and Ferreira, 2004; Bilimoria and Piderit 1994; Daily et al. 1999; Farrell and Hersch 2001; Kesner 1988) and that investigates whether it can enhance corporate performance (Adler, 2001; Carter et al., 2003; Catalyst, 2004). Our measures of women's participation in firm governance and top-level management come from the Catalyst 2001–2004 annual surveys.[1] Compared to previous studies,

our contribution is 2-fold. First, our empirical investigation builds explicitly upon agency theory (Tirole, 2001) and stakeholder theory (Donaldson and Preston, 1995). Second, whereas previous works used either raw stock returns or accounting ratios, we apply the Fama and French (1992, 1993) valuation framework, in order to take risk levels into account when comparing firm performances.

Our estimates reveal that firms operating in complex environments and which have a high proportion of women officers, did experience positive and significant abnormal returns of 0.17% monthly, intuitively amounting to a 6% return over a 3-year period. No significant excess returns are generated, however, when women participate as directors or when their impact is measured by a score combining their representation as both officers and directors. The latter suggests that the presence of female directors makes no difference as far as financial performance is concerned, for firms with a high proportion of women in both their management and governance systems generate enough value to keep up with normal stock-market returns. This might even mean that female directors outperform their male counterparts, since some empirical works recently pointed out the existence of a "glass cliff" whereby women appointed to senior positions are given riskier tasks (Ryan and Haslam, 2006, 2005). Altogether, our findings tend therefore to support the policies currently being discussed or implemented in some countries and organizations, which overtly seek to foster the advancement of women in business.

The article is structured as follows. Section "Theoretical background" covers some theoretical frameworks that relate gender diversity in corporate governance and high-level management to financial performance. Section "Prior empirical evidence" next examines prior empirical evidence relevant to our study. Section "Data and methodology" presents the data and methodology we use. Our empirical results are explained and discussed in Section "Results and analysis". Section "Conclusions" concludes the article.

Theoretical background

Before considering the empirical relationship between gender diversity and corporate financial outcomes, let us first briefly review the predictions made by two well-known theories – agency theory and stakeholder theory. In a nutshell, we can say that the former suggests having more female board members will bear no (i.e., neither negative nor positive) financial consequences, while the latter foresees business (and certainly social) benefits from actually promoting women to senior management positions.

Agency theory

In his 1999 Presidential address to the Econometric Society, Tirole (2001, p. 2) defines a "good" corporate governance structure as "one that selects the most able managers and makes them accountable to investors." Up to now, however, the best means of implementing these desiderata are still being sought.[2]

As the introduction points out, one possible means that has recently shown up on the agendas of academic researchers and corporate board members is the increase of gender diversity. To be sure, few women currently sit on the boards of major corporations. Yet, preliminary empirical evidence (to be reviewed in Section "Prior empirical evidence") suggests that better financial performance might result from increasing female presence on corporate boards and among senior management.

An agency-theoretic rationale for these findings would go as follows: women (like external stakeholders, ethnic minorities, and foreigners) often bring a fresh perspective on complex issues, and this can help correct informational biases in strategy formulation and problem solving (Dewatripont et al., 1999; Westphal and Milton, 2000).

While intuitively plausible and well grounded in cognitive psychology and decision theory, this explanation largely overlooks the concrete tasks mentioned in the above quote. Before it gives advice on strategy, for instance, a corporate board must first appoint the right person as CEO. Special attention will then be paid to the leadership style that seems most appropriate in the actual business landscape. An autocratic leader might do well in pulling the firm out of a financial crisis, but a more democratic leader will better stimulate creativity and intrapreneurship in highly competitive, innovation-driven industries

(Rotemberg and Saloner, 1993). If preferences for leadership styles are more influenced by gender than by economic considerations, however, a diverse board might well end up making the wrong appointment, thereby providing an untimely leadership style (or no leadership at all).

Corporate boards must also motivate and monitor the acting CEO. In appraising the latter's work, female directors might put forward the interests of employees and other stakeholders who have an impact on and are impacted by the company's performance (Kramer et al., 2006). But saddling the CEO with too many (often conflicting) requirements might blur the intended bottom line and dilute incentives, as other developments in agency theory have shown (see, for instance, Dixit, 1996; Heath and Norman, 2004).

From an agency-theoretic standpoint, when one considers the overall impact of gender diversity on the various duties being assumed by a corporate board, it is thus impossible to tell, whether promoting greater female participation will improve or impair corporate governance and, as a direct consequence, corporate financial performance. One might therefore expect that holding a preference for women in corporate board nominations is "neutral," as far as financial performance is concerned.

Stakeholder theory

The pressure on firms to appoint women as directors or senior managers comes from a broad set of people, which includes shareholder activists, large institutional investors (Fields and Keys, 2003, p. 12), politicians, and consumer groups. A useful grid to explore this phenomenon and its consequences is stakeholder theory. This framework is now widely acknowledged in the management literature for its descriptive accuracy, instrumental power, and normative validity (Donaldson and Preston, 1995, p. 65).

On the descriptive side, many studies – notably those by the Conference Board (2005) and Catalyst (2004) – have confirmed the accuracy of stakeholder theory. Our study now relies on the instrumental facet of this approach. From this viewpoint, the main proposition to be tested is that firms diligently doing stakeholder management – by giving more voice to women, for example – will, other things remaining

the same, be relatively successful. Many reasons would a priori support this assertion, such as catering to women's purchasing power, fostering a desired role model, signaling commitment toward organizational reform, and drawing from a wider range of intellectual capital. Exploring the latter rationale, for instance, Dallas (2002) surveys some psychology research considering the effect of group member characteristics, such as gender diversity, on group decision-making. To summarize, it seems that, in today's complex and rapidly changing business environment, when it comes to enhancing the quality of decision making, the advantages related to the knowledge, perspective, creativity, and judgment brought forward by heterogeneous groups may be superior to those related to the smoother communication and coordination associated with less diverse sets of people.

Our empirical analysis and conclusions will also border on the normative side of stakeholder theory. From this perspective, gender diversity would remain a sensible objective even if it does not necessarily lead to improved financial performance. Hence, even if no significant relationship – neither negative nor positive – were found between gender diversity and financial results, the promotion of women in business can still be viewed as a good policy. To be sure, valuable social issues such as family life and flexible work arrangements are often given more importance in companies that attract female executives and board members (Dallas, 2002). Hence, some countries like Norway have recently enacted laws fostering the presence of women in business organizations, and the Canadian province of Québec has just adopted a resolution to gradually increase to 50% the proportion of women sitting on the boards of state-owned firms (Audet, 2006).

In the next section, we will now turn to the empirical evidence which parallels the above theoretical developments.

Prior empirical evidence

Empirical research on the relationship between gender diversity in governance and top management and corporate financial performance is sparse. This is especially true if works dealing with peculiar types of diversity, such as racial, ethnic, and cultural diversity

are omitted. In this section, we review those studies which are directly relevant to our research questions.

Using a sample of 200 large US firms, Shrader et al. (1997) do not find any significant relationship between the percentage of women in the upper echelons of management and firm performance. Concerning the participation of women on boards, moreover, they find a negative impact on performance. The latter is measured using accounting data such as return on assets (ROA), return on sales (ROS), return on investments (ROI), and return on equity (ROE). The authors explain, however, that the low percentages of women among top managers or board directors – 4.5% and 8%, respectively – could impair the validity of their findings.

Adler (2001), on the other hand, finds a strong correlation between women-friendliness and firm profitability. His sample, composed of 25 Fortune 500 firms, seems to unveil a strong participation of women in executive slots. Three accounting measurements of operational performance are used: ROS, ROA and ROE.

In a more recent study, Carter et al. (2003) also encounter a positive relationship between board diversity (measured by the presence of women and minorities) and firm value. Using a sample of 638 Fortune 1000 firms, the results of this study suggest that a higher percentage of women and minorities on the board of directors can increase firm value, as proxied by Tobin's Q. The study also suggests that the proportion of women on boards is a significant determinant of the fraction of minority directors on boards. Yet, this research does not yield a clear-cut conclusion on the effect of a greater participation of women alone on firm value.

Ryan and Haslam (2005) searched the websites of all UK FTSE100 companies to identify those firms that had appointed a woman to their board during 2003. In total, they found 19 female board appointments which they matched for the time of appointment and business sector with 19 FTSE 100 companies that had appointed a man to their board. They compared their annual stock market performance as well as the fluctuations in their monthly performance six months before and after the appointment of a board member. Taking into account situational factors such as stock market fluctuations, they conclude from their archival study that women are more likely to be placed on a 'glass cliff,' in the sense that they are often appointed to leadership positions under problematic organizational circumstances associated with greater risk of failure and criticism.

In what can now be seen as another investigation of the ''glass cliff'' hypothesis, Adams and Ferreira (2004) next document that boards of directors tend to be more homogeneous when firms operate in riskier environments. This might happen, because social homogeneity breeds trust (an argument put forward by Kanter, 1977), and trust is in high demand when a crisis hits. The study also suggests that diverse boards receive additional compensation to palliate the decrease in homogeneity, which in turn may reduce firm value. Yet, the authors acknowledge that firms with more diverse boards hold more frequent board meetings and female directors have fewer attendance problems, which would rather contribute to board effectiveness. The net effect of gender diversity thus remains unclear.

In 2004, finally, Catalyst – a well-known organization often cited for its research on the place of women in business – examined the presumed connection between gender diversity and financial performance. Using a sample of 353 Fortune 500 companies taken from 1996 to 2000, this study comes to the conclusion that firms belonging to the top quartile in terms of diversity achieve better financial performance than their low-quartile counterparts. Financial performance is measured by ROE and raw stock returns, while gender diversity is based solely on the participation of women as corporate officers.

In the upcoming section, we shall now present the data and methodology used, and shall underline the steps taken to try to improve on the above research, especially with regard to including the risk and market factors pointed out by Ryan and Haslam (2006; 2005).

Data and methodology

Our measures of women's participation in the firm's governance and top management come respectively from the 2001 to 2003 Catalyst censuses of female directors, and the 2002 and 2004 Catalyst censuses of women officers in the Financial Post's list of the 500 largest Canadian firms (FP500). We combine the annual Catalyst data by computing the average

representation of women over the 2-year period: hence, if a firm with one female officer in a given year has none in another year, then it is viewed as having an average of 0.5 female officers. When a company's data is incomplete (e.g., exists for 1 year only), we also use it. Given the stability of the statistics used by Catalyst, we deem these methodological choices will have no influence on our results.

We also computed the overall percentage of female directors and officers, in order to test the combined effect of diversity in governance and top management on the firm's performance. This proportion is the sum of the number of female directors and the number of female officers, divided by the total number of positions.

Our initial sample was drawn from the 500 largest Canadian firms, as reported by the Financial Post. Year in, year out, this set contains around 244 publicly held companies, 204 privately held ones, 44 crown corporations and 8 co-operatives. As our study only concerns publicly held firms, our final sample comprises of approximately 230 firms. This figure was allowed to fluctuate slightly with the availability of data on female participation levels, stock returns and measures of risk and complexity.

To access the degree of variation in female representation across firms and to test its hypothesised relationship with performance, we split the sample into three layers, as in Catalyst (2004). This allows us to compare firms in the bottom tier – which exhibit a low proportion of women – to those in the top tier – which display a high proportion of women. Our subsequent univariate and multivariate analyses use this grouping to test for significant differences between the two groups as far as financial performance, risk and complexity are concerned. Since most of the data used in this study are not normally distributed or skewed to the right, we use non-parametric tests to compare group means.

Previous studies underlined the fact that diversity might help dealing with risky and complex situations. We have, therefore, developed a number of measurements to account for these factors: our proxies for risk and complexity are the firm's beta, the market-to-book ratio and the analysts' forecasts standard deviation. Market-to-book ratios are taken from Stock Guide, which publishes monthly accounting data and financial ratios based on the latest financial reports of Canadian public firms.

Analysts' forecasts standard deviations are obtained from the Institutional Brokers' Estimate System (IBES). Monthly average betas, finally, were computed from using information from the Toronto Stock Exchange (TSX) data bank.

The few studies (Adler, 2001; Carter et al., 2003; Catalyst, 2004; Shrader et al., 1997) examining the effect of diversity on long term financial performance took no account of risk which is of course a fundamental factor if one wants to compare the financial performance of firms. We first replicated those studies by computing monthly average gross returns for the period from January 2002 to December 2004. We then resort to the three-factor Fama/French (1992, 1993) valuation model in order to control for risk. This model seeks to explain the firm's return by its beta, its size and its book-to-market ratio. If it does not entirely explain the firm's financial performance, i.e., if the alpha coefficient of the linear model is significant (which can be interpreted as an abnormal return), this indicates an omitted variable. Running it separately for firms with a low and firms with a high proportion of women, we will reject the null hypothesis of no relationship between the representation of women and financial performance if the alpha is significant in the case of firms with the highest female proportion.

Results and analysis

Let us now turn to empirical results. First, we consider descriptive statistics concerning the difference between firms with respectively low- and high-female representation as officers, directors, or both. Then, we show and discuss our univariate analyses of the factors supposed to characterize firms that diversify their board of directors and their senior management team by appointing more women. Finally, we use the three-factor Fama/French (1992, 1993) model to investigate the relationship between gender diversity and financial performance.

Descriptive statistics and univariate analysis

Table I provides descriptive statistics on the average representation of women officers (panel A) and

directors (panel B), as well as on the combined measure of the proportion of women officers and directors (panel C) among FP500 firms. It can be seen that women represent 10.8% of the officers of FP500 firms, while they only hold 7% of the board seats. The combined measure gives an average of 9.1% female participation. The Jarque–Bera test rejects the null hypothesis of normality of the distributions of female representation.

Table II next contains descriptive statistics about risk and complexity. Our proxy for risk is the 3-year average monthly beta which is equal to 0.68. Our proxies for complexity reach 1.77 when measured as the firm's Market-to-Book ratio, and 0.04 when measured as the analysts' forecasts standard deviation. Low and high risk/complexity is determined by separating the sample on both sides of the median. Again, the Jarque–Bera test rejects the null hypothesis that the distribution of these measures is normal.

Table III compares the average monthly returns of firms with a low proportion of women officers to those of firms with a high proportion (panel A). The two groups are also compared after being separated on both sides of the median between low and high

TABLE I

Descriptive statistics on the representation of women officers (panel A), directors (panel B) and combined (panel C) of sampled firms (for the period 2001–2004)

Representation of women as	Statistics	All firms	Low percentage firms	High percentage firms
A: Officers 2002 and 2004	Number of firms	234	78	74
	Mean (%)	10.7808	0.4910	22.8743
	Median (%)	9.1000	0.0000	20.0000
	Maximum (%)	50.0000	4.8000	50.0000
	Minimum (%)	0.0000	0.0000	14.8000
	Std Deviation	10.2617	1.3137	7.8405
	Skewness	1.0436	2.3867	1.7065
	Kurtosis	4.2693	6.9853	5.9451
	Jarque-Bera	58.1841	125.6693	62.6620
	Jarque-Bera *p*-value	0.0000	0.0000	0.0000
B: Directors 2001–2003	Number of firms	229	105	74
	Mean (%)	7.0201	0.0000	16.7392
	Median (%)	4.8000	0.0000	15.4000
	Maximum (%)	50.0000	0.0000	50.0000
	Minimum (%)	0.0000	0.0000	10.5000
	Std Deviation	8.1210	0.0000	6.0358
	Skewness	1.2489		2.6921
	Kurtosis	5.5062		14.0616
	Jarque-Bera	119.4605		466.6560
	Jarque–Bera *p*-value	0.0000		0.0000
C: Directors and officers 2001–2004	Number of firms	219	72	73
	Mean (%)	9.0639	1.5361	17.4836
	Median (%)	8.1000	0.0000	16.0000
	Maximum (%)	33.3000	4.9000	33.3000
	Minimum (%)	0.0000	0.0000	11.8000
	Std Deviation	7.2113	1.8179	4.6306
	Skewness	0.6508	0.4958	0.9922
	Kurtosis	2.8818	1.5474	3.7296
	Jarque–Bera	15.5871	9.2791	13.5974
	Jarque–Bera *p*-value	0.0004	0.0097	0.0011

TABLE II

Descriptive statistics of the sampled firms risk and complexity (for the period 2002–2004)

Variables	Statistics	All	Low* risk/ complexity	High* risk/ complexity
Three year average monthly beta	Number of firms	179	82	97
	Mean	0.6775	0.2714	1.0207
	Median	0.5505	0.2599	0.8606
	Maximum	2.9266	0.5217	2.9266
	Minimum	0.0036	0.0036	0.5258
	Std Deviation	0.5500	0.1468	0.5318
	Skewness	1.6758	0.0217	1.7562
	Kurtosis	6.2419	1.9748	5.5160
	Jarque–Bera	162.1679	3.5973	75.4464
	Jarque–Bera p-value	0.0000	0.1655	0.0000
Market-to-book ratio	Number of firms	187	95	92
	Mean ratio	1.7714	0.9664	2.6027
	Median	1.5062	0.9997	2.1587
	Maximum	12.8900	1.5100	12.8900
	Minimum	0.0306	0.0306	1.5421
	Std Deviation	1.3556	0.3505	1.5013
	Skewness	3.7509	-0.3838	4.0747
	Kurtosis	27.2250	2.2749	25.9614
	Jarque–Bera	5011.0340	4.4133	2275.6200
	Jarque–Bera p-value	0.0000	0.1101	0.0000
Analysts' forecasts standard deviation	Number of firms	134	70	64
	Mean	0.0401	0.0097	0.0733
	Median	0.0219	0.0091	0.0420
	Maximum	0.7978	0.0229	0.7978
	Minimum	0.0000	0.0000	0.0230
	Std Deviation	0.0791	0.0083	0.1049
	Skewness	7.0025	0.1500	5.4241
	Kurtosis	64.6301	1.4767	37.0749
	Jarque–Bera	22302.1100	7.0303	3410.0880
	Jarque–Bera p-value	0.0000	0.0297	0.0000

* Low and high risk/complexity is determined by separating the sample on both sides of the median.

beta, in order to take risk and complexity into consideration. The same is done for firms with women as directors relative to firms with women as both officers and directors respectively, for low- and high-market-to-book ratios (panel B) and for the standard deviations of the analysts' forecasts (panel C). The small difference in the number of firms between the three subcategories is due to the data available from the Catalyst censuses and the returns displayed in the TSX data bank. Non-parametric tests at the conventional level of 5% show no significant difference

between the two groups, even when risk and complexity are taken into consideration.

Table IV, finally, uses the ratio of return on equity (ROE) to compare financial performances when female representation is low or high. In agreement with several previous studies (notably Adler, 2001; Catalyst, 2004; Shrader et al., 1997), firms with a high proportion of women officers and directors tend to beat their counterpart's performance significantly. But again, there is generally no significant difference between the two groups once

TABLE III

Comparison of average monthly returns between high and low representation of women while considering risk and complexity (for the period 2002–2004)

A: Beta comparison	N	Median	N	Median	N	Median
	All		Low beta		High beta	
Low percentage of women officers	78	0.0127	39	0.0114	39	0.0190
High percentage of women officers	74	0.0148	37	0.0135	37	0.0205
Wilcoxon/Mann–Whitney – value and *p*-value	0.4055	0.6851	0.1611	0.8720	0.6339	0.5261
Low percentage of women directors	102	0.0165	39	0.0156	63	0.0170
High percentage of women directors	74	0.0110	43	0.0111	31	0.0109
Wilcoxon/Mann–Whitney – value and *p*-value	1.6064	0.1082	1.3231	0.1858	1.0857	0.2776
Low percentage of women officers & directors	72	0.0165	28	0.0126	44	0.0181
High percentage of women officers & directors	73	0.0137	37	0.0146	36	0.0115
Wilcoxon/Mann–Whitney – value and *p*-value	1.0282	0.3039	0.5100	0.6100	0.6480	0.5170
B: Market-to-book comparison	All		Low MB		High MB	
Low percentage of women officers	75	0.0126	41	0.0125	34	0.0142
High percentage of women officers	69	0.0149	35	0.0155	34	0.0148
Wilcoxon/Mann–Whitney – value and *p*-value	0.6618	0.5081	0.3231	0.7467	0.3434	0.7313
Low percentage of women directors	102	0.0165	61	0.0203	41	0.0114
High percentage of women directors	70	0.0110	28	0.0128	42	0.0107
Wilcoxon/Mann–Whitney – value and *p*-value	1.7283	0.0839★	0.9675	0.3333	0.9427	0.3458
Low percentage of women officers & directors	74	0.0165	45	0.0217	29	0.0114
High percentage of women officers & directors	68	0.0139	29	0.0155	39	0.0135
Wilcoxon/Mann–Whitney – value and *p*-value	0.9985	0.3181	1.2180	0.2232	0.2232	0.8234
C: Analysts' forecasts standard deviation comparison	All		Low AFSD		High AFSD	
Low percentage of women officers	51	0.0119	24	0.0128	27	0.0119
High percentage of women officers	54	0.0153	31	0.0149	23	0.0157
Wilcoxon/Mann–Whitney – value and *p*-value	0.7149	0.4747	0.4158	0.6776	0.5061	0.6128
Low percentage of women directors	66	0.0165	38	0.0100	28	0.0189
High percentage of women directors	50	0.0114	21	0.0106	29	0.0117
Wilcoxon/Mann–Whitney – value and *p*-value	0.8223	0.4109	0.1187	0.9055	1.8117	0.0700★
Low percentage of women officers & directors	48	0.0179	23	0.0170	25	0.0189
High percentage of women officers & directors	52	0.0136	27	0.0114	25	0.0137
Wilcoxon/Mann–Whitney – value and *p*-value	0.6589	0.5100	0.1363	0.8916	0.9119	0.3618

★★★, ★★, ★ Significantly different from zero at the 1, 5, and 10 percent levels, respectively

risk and complexity are explicitly taken into account.

The latter findings are not inconsistent with the predictions of agency theory, but they do not support the instrumental perspective of stakeholder theory. If one bears in mind the "glass cliff" hypothesis (Ryan and Haslam, 2005), however, the above results tend to uphold the normative viewpoint that gender diversity is a policy worth pursuing, even if no significant relationship is found between diversity and performance. Let us now turn to the multivariate analysis.

Multivariate analysis

This section builds on the three-factor Fama/French multivariate model (1992, 1993). This model is widely used in the literature to estimate a firm's expected return as a function of its beta, its size and

TABLE IV

Comparison of average return on equity (ROE) between high and low representation of women while considering risk and complexity (for the period 2002–2004)

A: Beta comparison	N	Median	N	Median	N	Median
	All		Low beta		High beta	
Low percentage of women officers	71	9.5167	36	11.4517	33	7.6433
High percentage of women officers	68	12.0133	74	11.2817	32	12.4817
Wilcoxon/Mann–Whitney – value and p-value	0.7500	0.4533	0.0000	1.0000	1.0563	0.2908
Low percentage of women directors	91	9.1167	36	10.9650	55	7.5833
High percentage of women directors	66	12.3267	39	13.8900	27	8.3800
Wilcoxon/Mann–Whitney – value and p-value	1.7122	0.0869★	1.3945	0.1632	0.4539	0.6499
Low percentage of women officers & directors	65	8.6600	27	9.1867	38	7.6133
High percentage of women officers & directors	67	11.5450	36	12.3267	31	9.7067
Wilcoxon/Mann–Whitney – value and p-value	1.8503	0.0643★	1.2639	0.2063	1.2365	0.2163
B: Market-to-book comparison	All		Low MB		High MB	
Low percentage of women officers	75	9.5167	41	3.5633	34	16.0917
High percentage of women officers	77	11.9367	37	9.9267	40	14.7433
Wilcoxon/Mann–Whitney – value and p-value	1.0080	0.3135	1.6111	0.1072	0.8948	0.3709
Low percentage of women directors	96	9.2483	56	4.7167	40	14.6950
High percentage of women directors	75	12.7167	30	7.7533	45	15.4133
Wilcoxon/Mann–Whitney – value and p-value	1.7790	0.0752★	0.5211	0.6024	0.5239	0.6004
Low percentage of women officers & directors	69	9.0133	42	6.2283	27	13.7200
High percentage of women officers & directors	73	12.090	29	8.3800	44	15.7133
Wilcoxon/Mann–Whitney – value and p-value	2.4592	0.0139★★	0.7194	0.4719	1.1311	0.2580
C: Analysts' forecasts standard deviation comparison	All		Low AFSD		High AFSD	
Low percentage of women officers	46	10.4617	24	11.6783	22	8.6450
High percentage of women officers	52	12.5783	30	12.1883	22	12.8883
Wilcoxon/Mann–Whitney – value and p-value	0.6264	0.5310	0.2002	0.8413	0.4342	0.6641
Low percentage of women directors	59	9.3333	31	9.0133	28	10.3067
High percentage of women directors	53	11.9367	22	13.79667	31	10.4333
Wilcoxon/Mann–Whitney – value and p-value	1.2354	0.2167	2.0488	0.0405★★	0.6755	0.4994
Low percentage of women officers & directors	44	7.6133	18	−1.0650	26	9.8733
High percentage of women officers & directors	52	12.4033	26	13.4217	26	10.4467
Wilcoxon/Mann–Whitney – value and p-value	2.4155	0.0157★★	3.8073	0.0001★★★	0.2105	0.8333

★★★, ★★, ★ Significantly different from zero at the 1, 5, and 10 percent levels, respectively

its book–to–market ratio (BM). Running it separately for firms with low- and high-female representation, the null hypothesis of no relationship between the presence of women and firm performance will be rejected if the coefficient alpha, which represents abnormal returns is significant for firms with the highest proportion of women.

Our basic empirical equation is the following one:

$$R_{pt} - R_{ft} = a_p + b_p (R_{mt} - R_{ft}) + s_p \, SMB_t + h_p \, HML_t$$

where $R_{pt} - R_{ft}$ is the monthly excess return of the portfolio of sampled firms over the risk-free rate, $R_{mt} - R_{ft}$ is the excess return required by the market over the risk-free rate, as used in the capital asset pricing model (CAPM), SMB (Small

TABLE V

Comparison of average monthly abnormal returns (alphas) between high and low sub-samples as estimated by the Fama & French three factor model with corresponding *p*-values (for the period 2002–2004)

A: Beta comparison	Alpha	*p*-Value	Alpha	*p*-Value	Alpha	*p*-Value
	All		Low beta		High beta	
Low percentage of women officers	0.0001	0.9098	0.0001	0.8539	0.0001	0.9215
High percentage of women officers	0.0006	0.2388	−0.0001	0.9535	0.0017	0.0785★
Low percentage of women directors	0.0000	0.9311	0.0001	0.8849	−0.0001	0.8606
High percentage of women directors	0.0000	0.9560	0.0003	0.5455	−0.0006	0.4845
Low percentage of women officers & directors	0.0003	0.6841	0.0003	0.7148	0.0000	0.9634
High percentage of women officers & directors	0.0004	0.2477	0.0002	0.8081	0.0006	0.4736
B: Market-to-book comparison	All		Low MB		High MB	
Low percentage of women officers	0.0000	0.9671	−0.0010	0.3391	0.0007	0.2678
High percentage of women officers	0.0006	0.2312	0.0000	0.9971	0.0016	0.0091★★★
Low percentage of women directors	0.0001	0.8569	−0.0001	0.8995	0.0000	0.9540
High percentage of women directors	0.0000	0.9560	0.0004	0.7398	0.0001	0.8677
Low percentage of women officers & directors	0.0002	0.6992	0.0001	0.9168	−0.0003	0.7524
High percentage of women officers & directors	0.0004	0.2929	0.0005	0.6492	0.0008	0.1193
C: Analysts' forecasts standard deviation comparison	All		Low AFSD		High AFSD	
Low percentage of women officers	0.0003	0.6384	0.0005	0.5093	0.0004	0.8248
High percentage of women officers	0.0008	0.1151	0.0011	0.1844	0.0019	0.0807★
Low percentage of women directors	−0.0001	0.8845	−0.0006	0.6337	0.0012	0.2095
High percentage of women directors	0.0003	0.4774	−0.0005	0.6491	0.0008	0.2295
Low percentage of women officers & directors	0.0000	0.9599	−0.0007	0.7310	0.0009	0.4360
High percentage of women officers & directors	0.0005	0.1773	0.0004	0.6180	0.0011	0.1579

★★★, ★★, ★ Significantly different from zero at the 1, 5, and 10 percent levels, respectively

minus Big) stands for the excess return required for investing in small rather than big firms, HML (High minus Low) denotes the excess return required for value firms (high-book-to-market ratios) as opposed to growth firms, and the intercept "a" captures monthly average abnormal return.

The portfolio and market returns are computed on an equally weighted basis. We use weighted-least-squares regressions to control for the heteroskedasticity potentially induced by the fact that the number of firms in our monthly portfolios fluctuates over time.[3] The weights are the reciprocal of the square root of the number of firms in each month. In order to account for size and book-to-market peculiarities in Canada, b, s, and h coefficients are estimated using Toronto Stock Exchange (TSX) returns for the period from 1990 to 2004. To compute SMB, following Fama and French (1992,

1993), we sorted stocks into 6 portfolios and ranked them based on their size and BM ratios. The stocks were subsequently split into two size groups and three BM subgroups. Firms above median size are considered "big" and firms below the median are considered "small." Firms in the bottom 30% in terms of BM ratio are also designated as "low" ones, and those in the top 30% are said to be "high" ones. The SMB factor represents the average excess return of small firms over big firms, while the HML factor corresponds to the average excess return of value firms (with high BM ratios) over growth firms (with low BM ratios).

In order to validate our estimations, for every month from January 1990 to December 2004, we formed 25 portfolios using the size and book-to-market ratios of all TSX firms for which we found values in the Stock Guide database. For every

month, we ranked and sorted all firms into five groups based on size and five subgroups based on BM ratio. For every month, we ran 25 regressions of the Fama and French model. We used 91-day Canadian Government Treasury Bills as a proxy for the risk-free rate (Rf). The market return is the equally weighted value of all stocks quoted on the TSX. As already expected based on Fama and French's work, results show that the SMB and HML factors we use are significant drivers of excess returns for Canadian firms.[4]

Table V finally shows that firms operating in complex environments, as measured by high betas (panel A), high-market-to-book ratios (panel B) or analysts' forecasts standard deviation (panel C), generate positive and significant abnormal returns when they have a high proportion of women officers. From an economic perspective, these firms generate a positive and significant monthly abnormal return of 0.17%, which can intuitively be viewed as a 6% return over 3 years. This result is robust, whatever way we measure complexity, and it supports the instrumental view of stakeholder theory.

On the other hand, better female representation, as measured either by the proportion of women sitting on the board of directors or by a score combining the relative presence of women as officers or directors, does not correlate with significant excess returns. Hence, although having more female directors may not have an impact on financial performance, firms with a higher proportion of women on their board are able to generate enough value to keep up with normal stock-market returns.

Conclusions

In this article, we test the main predictions of agency and stakeholder theory concerning the impact on firms' performance of increased female representation in corporate boards and top management. We use the Fama and French (1992, 1993) valuation framework to take the level of risk and other market factors into consideration when comparing performances, while previous studies relied solely on either raw stock returns or accounting ratios. Taking risk and complexity into consideration is important given Ryan and Haslam's (2005) results. They conclude from their archival study that women

are often appointed to leadership positions under problematic organizational circumstances associated with greater risk of failure and criticism, which suggests the existence of a 'glass cliff.'

Our results indicate that firms operating in complex environments that have a high proportion of women officers do experiment positive and significant monthly abnormal returns of 0.17%, which can intuitively be extrapolated to a 6% return over 3 years. This finding is consistent with stakeholder theory. On the other hand, having more women on corporate boards or on both corporate boards and top management does not seem to generate significant excess returns. This fits the viewpoint of agency theory and means, in fact, that firms with a high proportion of women in both their management and governance systems create enough value to keep up with normal stock-market returns. However, given the "glass cliff" hypothesis, this might even mean that female directors outperform their male counterparts because, compared to men, the positions women are given may be less promising to start with.

These results should be interpreted with caution, as the Fama and French three-factor model is intended to be used with large sample sizes over long time periods. Although we used a long time period (1990–2004) and a large sample (all Toronto Stock Exchange firms) to mitigate these concerns and validate our model parameters, we had to resort to a relatively smaller sample size and time period to conduct our empirical tests because of the limited availability of data on gender diversity.

Altogether, our findings tend to justify current efforts by some countries and organizations to craft and enforce policies that explicitly seek the advancement of women in business. More testing would of course be welcome, though, especially on data from other industrialized countries like the United States or Japan. One might want to also consider medium and even small firms instead of only the largest ones. Finally, in addition to the complexity issue first raised in this article, further research should examine other features of the business landscape that can influence the impact of women, such as the specific professional cultures that prevail across industry sectors or the various countries and continents the given companies are currently doing business in.

Acknowledgment

Notes

[1] Catalyst is the leading research and advisory organisation in North America which fosters the advancement of women in business.

[2] Like most finance, accounting and economics scholars, we center here on how to foster shareholder value

[3] See Boehme and Sorescu (2002) amongst others.

[4] These analyses are available upon request.

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