

**Are All Welcome A-board:  
Does the Gender of Directors Matter?**

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**Abstract**

I examine boards that are relatively gender-balanced (a third of their directors are women): boards of business firms in which the Israeli government holds shares. First, I do not find a significant association between the proportion of women directors on board and financial performance. Second, I find that women directors tend to be on the committees that discuss audit issues, as opposed to business issues, although their presence in board meetings, in which no additional appointment mechanism exists, significantly increases the likelihood that business issues be discussed, as opposed to audit issues. Last, I find that a dual critical mass – defined as one which consists of at least three women directors and at least three men directors in attendance – most enhances the activeness of boards: Boards with such a dual critical mass were more than twice as likely as boards without one both to take an initiative (e.g., suggest which action should be taken) and to request further information or an update.

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# 1 Introduction

Many finance studies have investigated exhaustively how board composition impacts upon financial performance and upon the working of boards. However, most of these studies examined the differential impact of inside versus outside directors, whereas until recently, the impact of the gender of the directors has received only limited attention. This is the subject I investigate in this paper: How does the gender of directors impact upon financial performance and upon the working of boards? I examine business firms in which the Israeli government holds a substantial equity interest (GBCs) because, as shall be detailed, the data to which I have been given access and the unique settings of GBCs may offer certain advantages for examining the impact of gender and the work of boards.<sup>2</sup>

The impact of gender upon the workings of boards is currently of special interest because many countries have already legislated laws or advanced policies which aim at increasing the percentage of women directors on boards (e.g., Norway, Spain and France), and other countries are considering following in their footsteps (e.g., Belgium and Great Britain). Furthermore, Dr. Viviane Reding, the vice president of the European Commission, is pushing companies to voluntarily commit to targets of women directors, and if this does not happen, she intends to advance legislation enforcing such quotas.

However, two major limitations of extant studies do not allow decision-makers to fully recognize the costs and benefits of such policy and legislation. The first limitation is addressed by Ferreira (2010) in his survey on women directors: "Knowing much about what goes on in the boardroom is difficult. Minutes of meetings and voting outcomes are understandably treated as secret documents, when they exist at all. Thus, measuring the individual contribution of each director to the decision-making process is usually impossible." As shall be detailed, I have been allowed access to detailed minutes of meetings,

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<sup>2</sup> Since the primary factor examined in this paper is gender, the fact that the Israeli government holds shares in these firms should not impinge upon the representativeness of the findings.

which allow me to examine how women directors impact upon the actions boards take and upon the work they do.

The second limitation of extant studies is that they are usually unable to examine gender-balanced boards, for they are very rare: In 2010 women constituted only 16% of the directors of S&P 500 companies (Spencer Stuart, 2010); in most other countries, that figure ranges between 0.1% and 15% (see Figure 1, taken from Catalyst, 2011). However, studies of boards with none, one, or two women directors might not reflect what would occur in gender-balanced boards.

In contrast to most extant studies, the GBCs I examine are relatively gender-balanced. As Panel 1 of Table 1 demonstrates, on average, during 2000-2007 women consisted 32% of the boards of GBCs. This relatively high proportion of women directors exists because, since 1993, the Israeli Government Companies Law requires that the boards of GBCs be composed in such a way that “gives appropriate representation to women”<sup>3</sup> (i.e., that they comprise approximately half the board). This law is enforced by a special governmental committee. To my knowledge, Israel was the first country to adopt a law setting such a quota<sup>4</sup> (although it is somewhat vague and is restricted to government owned firms).

This study does not document a direct relation between the gender of directors and financial performance (2000-2007) for the thirty-seven GBCs examined. However, gender is found to impact significantly upon the work of boards and their dynamics. To allow a systematic analysis on how gender impacts upon the work of boards and their dynamics I adopt concepts introduced by economic models that offer a framework for analyzing how homogeneity versus diversity in teams impacts upon productivity. These models identify the

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<sup>3</sup> Translated from Hebrew by Miriam Schwartz-Ziv.

<sup>4</sup> The next country which took a similar step was Norway, which only in 2003 adopted such a requirement (pertaining to public firms), effective 2006. This means that the Israeli firms affected by the legislation have had a substantially longer period to adjust.

existence of complementing skills, peer monitoring, and communication, as factors that all impact upon the productivity of teams, or the level of effort they exert.

Prior studies have relied on board-committee appointment patterns to infer whether men and women directors have certain specializations/ propensities to carry out certain types of tasks. I examine minutes of eleven GBCs (for a period of one year), both of board meetings and of board-committee meetings using the content analysis methodology. I find that board-committee appointment patterns do not reflect the type of tasks that women directors have a tendency to conduct. I find that in board-committees the presence of women directors is associated with a reduced likelihood that business issues (as opposed to audit issues) be discussed. These findings are consistent with prior studies. However, I also examine how the presence of women directors impacts upon what is discussed at board-meetings, for which no additional appointment mechanism exists. Here I find that women directors *increase* the likelihood that business issues be discussed. Hence, the findings suggest that men and women directors may indeed have propensities to carry out different types of tasks, or focus on different types of issues, however, these propensities are not consistent with the types of committees to which men and women directors are appointed.

Last, an analysis of the abovementioned minutes documents that boards with critical masses of at least three men directors and at least three women directors enhance the effort exerted by the board. Boards were found to be most active – i.e., requested further information and took an initiative (e.g., proposed what action should be taken) when critical masses of both three men directors and three women directors were in attendance. These findings may imply that peer monitoring and communication, within genders and/or between genders, are most effective when both genders consist a significant portion of the board.

## **2 Theory**

Hoogendoorn et al. (2011) point out that “economic theory has remained relatively silent about the optimal share of women in (board) teams and the mechanisms that cause diverse boards to perform differently”. Specifically, the extant models that address board composition all analyze the impact of insiders versus outsiders (e.g., Hermalin and Weisbach, 1998; Harris and Raviv, 2008; Chemmanur and Fedaseyeu, 2011) rather than gender. True, these models examine how two different types of sub-groups of the board impact upon board independence, which translates into financial performance. However, the point of departure of those studies is the assumption that the two groups they study, insiders and outsiders, have different knowledge, access to data, and incentives – and those differences are irrelevant to a study addressing the gender of the directors.

General models on homogeneity versus diversity may offer a more informative insight. Becker’s (1957) pioneering model on the economics of discrimination in the marketplace departs from the assumption that people have a “taste for discrimination”, or, in other words, that communicating with a person who belongs to a different type of group (e.g., social or ethnic) is costlier than communicating with a person who belongs to one’s own group. Similarly, Kandel and Lazear (1992), Lazear (1999), and Hamilton et al. (2004), who all model homogeneity versus diversity in teams, emphasize the cost of communication in heterogeneous groups, costs which impinge upon performance. Heterogeneous groups are defined in these models as groups with differences in quality and occupation, countries and cultures, and demographics (age and ethnicity), respectively – but not gender.

Kandel and Lazear (1992) stress that peer monitoring will be most intense in homogenous groups, because individuals feel more guilty and ashamed to “cheat ‘their own kind’”. In Lazear (1999) and Hamilton et al. (2004), communication costs in heterogeneous groups may be balanced and even outweighed if the team consists of members with

complementing/ heterogenic skills, abilities, and information which are required to carry out the task successfully.

The abovementioned models do not address gender and boards explicitly. In order to understand whether these models can also be applied to the gender of directors, the relation between gender and each of the following variables must be examined: (1) the existence of **complementing skills** or propensity to conduct certain types of tasks that boards are required to conduct (2) **peer monitoring** among the directors, and (3) **communication** within the board.

As for *what* it is that these variables impact: The abovementioned studies highlight that the existence of complementing abilities within boards, peer monitoring, and communication all play, simultaneously, a role in determining the output of the team, which in the case of boards would be financial performance. Accordingly, the next section (3.1) addresses empirical findings on gender and financial performance. It is followed by Section 3.2 which presents empirical findings on how the gender of directors affects each of the three factors identified above.

### **3 Empirical Studies and Hypotheses**

#### **3.1 The Association between Women Directors and Financial Performance**

Rhode and Packel (2010) provide a comprehensive survey of empirical studies that examine the association between the proportion of women directors and financial performance. They conclude that a relationship between the gender of directors and financial performance has not been convincingly established. Specifically, some studies find a *positive* association between the percentage of women directors and firm performance. For example, Carter et al. (2003) and Erhardt et al. (2003) document a significant positive relation between the proportion of women on board and firm value/ ROA and ROI ratios, respectively. Similarly,

Farrel and Hersh (2005) document a positive association between return on assets and the likelihood that a woman director be added to the board. In contrast, other studies found either *no relationship* between these variables or a *negative* one. Shrader et. al (1997) do not find a significant relation between the percentage of women directors and ROA and ROI ratios; Adams and Ferreira (2009) find that firms perform worse the greater the proportion of women directors.

Perhaps the studies just mentioned document an inconsistent relation between gender and firm performance, at least in part, because they (and also most of the other studies examining this relation) examine companies in which women consisted only a negligible portion of the board – 5%-13%, i.e., approximately one woman director. In contrast to these studies, recent research papers have been able to examine settings in which gender-balanced boards/ teams operate.

Matsa and Miller (2011) and Ahern and Dittmar (2011) both investigate Norwegian public companies whose boards were required, as of 2006, to include at least 40% women directors. Matsa and Miller (2011) find a decrease in the profitability of these firms, and Ahern and Dittmar (2011) document a decrease in the firms' value. Nevertheless, as the data presented in Ahern and Dittmar (2011) imply the sudden demand for female directors forced Norwegian firms to appoint younger and less experienced (female) directors, and it is possible that those characteristics, rather than gender, led to the decline in firm performance (although Ahern and Dittmar, 2011, do not interpret their findings this way).

However, there is also some evidence in support of the argument that having a significant proportion of each of the genders enhances performance: In an experiment conducted by Hoogendoorn et al. (2011), they constructed teams, comprised of male and female students with similar backgrounds. The teams included different proportions of each gender. Sales, profits, and earnings per share were maximal for “firms” in which women

consisted between 50%-60% of the “boards” (i.e., teams). Similarly, Apesteguia et al (2011), who examine the performance of three-student teams, also find certain evidence that teams which consisted of both genders – in their case: teams of two men and one woman – outperformed the teams that did not. On the basis of the contradictory findings concerning the relation between women directors and financial performance (both of studies that examine gender-balanced boards/ teams, and of those which do not) the following contradictory hypotheses are made:

**Hypothesis 1a:** The proportion of women directors is positively associated with firm performance even when women directors constitute a relatively large proportion of the board.

**Hypothesis 1b:** The percentage of women directors is negatively associated with firm performance even when women directors constitute a relatively large proportion of the board.

## **3.2 How Gender Impacts Upon the Working of Boards**

### **3.2.1 Having Different Abilities/ Propensities**

Adams and Funk (2011) find that men and women directors have significantly different values.<sup>5</sup> This raises the possibility that their abilities or their propensities to conduct certain types of tasks will also differ. However, scholars were usually not able to address this question directly because they had very limited access to what goes on in the boardroom. For this reason, they have mainly analyzed observable variables which may reflect the type of work which women directors focus upon, as opposed to that men directors prefer.

Thus, studies have examined the type of board-committees to which women directors were more likely than men directors to be appointed. Earlier studies examined only cross-sectional data sets: Kesner (1988), Bilimoria and Piderit (1994), and Peterson and

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<sup>5</sup> Adams and Funk (2011) examine whether the values of women directors are different from those of male directors using the ten basic human values identified by Schwartz (1992). They find that men directors are more oriented towards achievement and power, while women directors, who made it to the top, are less security and tradition oriented.

Philpot (2007) examined 1983, 1984, and 2003 data sets, respectively. Nevertheless, these studies include in their analysis extensive information on the professional experience of the directors. Adams and Ferreira (2009) examine a large panel data set of over 1990 US firms for the years 1996-2003. Because their dataset is relatively up-to-date, their analysis includes types of committees that have become more common in recent years.

Although these studies examine different periods, and have access to different information, some of their findings are quite consistent: Men directors are likely to be appointed to the executive committee, which act on behalf of the board during the interval between board meetings (Kesner, 1998; Bilimoria and Piderit, 1994; and Peterson and Philpot, 2007) and the compensation committee (Bilimoria and Piderit, 1994; Adams and Ferreira, 2009). Women directors are more likely to be appointed to the public affairs committee (Bilimoria and Piderit, 1994 and Peterson and Philpot, 2007) the audit committee (Adams and Ferreira, 2009), and the corporate governance committee, (Adams and Ferreira, 2009).

Taken together, the studies on gender and board-committees appointments suggest that women directors are more likely to be on committees that conduct tasks oriented toward monitoring and toward sustaining the corporate governance of the firm, while men directors are more likely to conduct the business-oriented tasks. However, the weakness of examining the linkage between gender and board-committee appointments is that it is difficult to determine, convincingly, whether women directors are appointed to certain committees because they are pushed to the less prestigious committees (as argued by Bilimoria and Piderit, 1994) or, rather, because they have a relative advantage for committees that require a specialization or propensity to carry out monitoring or sustaining tasks. The latter argument would conform to studies that conclude that tokenism does not exist (e.g., Kesner, 1988 and Adams and Ferreira, 2009).

Adams and Ferreira (2009) are somewhat able to circumvent this limitation faced by most of the board composition studies, by examining the link between the percentage of women directors and an indication that reflect the actions of boards: They examine CEO turnover, and find that it is more sensitive to stock return performance in firms with relatively many women directors. Ferreira (2010) explains that these findings imply that women directors are more likely to hold CEOs accountable for poor stock price performance. Taken together with the studies pertaining to board committees, the limited extant findings suggest that women directors may have a relative advantage, or at least a relative propensity, for tasks that require supervision and corporate governance oriented abilities, while men directors may have a relative advantage, or a relative propensity, for conducting business-oriented and tasks. Based on the studies just surveyed I make the following hypothesis:

**Hypothesis 2:** Women and men each specialize/ have a propensity to conduct certain types of tasks – women directors specialize in tasks that entail monitoring and sustaining the corporate governance of the firm, while men directors specialize in business-oriented and tasks.

### **3.2.2 Peer Monitoring and Communication**

**Peer monitoring.** The limited evidence that exists implies that peer monitoring in boards/ teams is more intensive when both men and women are present: Adams and Ferreira (2009) find that men directors have fewer attendance problems the larger the proportion of women directors on the board. In the experiment conducted by Hoogendoorn et al. (2011), mentioned above, the authors conclude that peer monitoring (as reflected, for example, by the success of the individual team-members in fulfilling their obligations to the team in a timely manner) is more intense when both genders compose a substantial proportion of the team. These two studies imply that peer monitoring, and perhaps its outcomes, are catalyzed by having a significant proportion of both genders.

**Communication.** Studies stress that effective communication between women and men directors depends on whether one gender (in practice, women) is marginally represented or, in contrast, a critical mass of both genders exists. Kanter (1977) provides many examples of how settings in which women compose only a marginal proportion of a group in their organization raise barriers that hinder interaction and effective communication between the men and women in the group. Kramer et al. (2007) document that both men and women directors experienced difficulties in communicating effectively with each other when just one or two women directors were on a board.

Accordingly, scholars have stressed that a critical mass of women directors is required to foster effective communication. Shrader et al. (1997), who echo Rosener (1995), state: “One female board-member is often dismissed as a token. Two females are not enough to be taken seriously. But three gives the board a critical mass and the benefit of the women’s talents”. Similarly, Kramer et al. (2007) find that “the magic” occurs when three women directors are on a board, because this constitutes a sufficient critical mass required to allow the others to notice the women directors’ opinions, rather than their gender. However, these studies either point out the limitation of the extant studies (Rosener, 1995; Shrader et al., 1997) or rely on a limited number of interviews (Kramer et al., 2007). They do not analyze actual dynamics in real gender-balanced boards.

The studies surveyed above suggest that the quality of communication, and perhaps also the intensity of peer monitoring, depend on the existence of a critical mass of at least three women directors. These studies stress the importance of the existence of a critical mass of women directors, rather than one of men directors, because the latter is very common, whereas the former is very rare. Because I examine relatively gender balanced boards I generalize the argument of these studies to both genders, and make the following hypothesis:

**Hypothesis 3:** Boards with critical masses of both men and women directors will exert more effort and be more active.

#### **4 Backgrounds of Directors**

Panels 1-3 of Table 1 document that women directors constituted approximately a third of the boards of the GBCs examined. As mentioned, women directors in other countries, and in listed companies in Israel, usually comprise a substantially smaller portion of boards, usually less than 16% (see Figure 1). Panel 2 of Table 1 presents summary statistics on the directors of the GBCs examined, alongside comparative data for several other benchmark-boards (Israeli listed, Norwegian listed, Swiss listed, and American S&P 500 companies; sources are specified in Panel 2 of Table 1). As is evident from that panel, the men directors serving on boards of the eleven GBCs examined were older than their women counterparts – a phenomenon which has also been documented for the Israeli listed, Norwegian listed and American S&P 500 firms; were more likely to have executive experience<sup>6</sup> – documented for all other benchmark-firms mentioned above; and were less educated – documented also for Israeli listed, and for Norwegian listed firms, but not for Swiss listed firms.

As Panel 2 of Table 1 documents, the directors of the GBCS examined in this study are somewhat younger than their counterparts in other countries. Naturally, they are probably also less experienced and have less executive experience. Despite this limitation, because this study focuses on how differences in genders impact board-dynamics, the impact of gender on the dynamics of GBC boards may well reflect its impact also in other boards around the world, which as seen above, are usually composed of men and women directors with similar differences in their backgrounds.

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<sup>6</sup> As a rule, in most studies executive experience was defined as one of the following positions: CEO, an executive position in an organization - e.g., head of a functional unit, partner/principal, or vice president. However definitions vary across studies.

## 5 Data and Methodology

As mentioned, two different data sets are used to conduct the analysis: The first data set allows is a panel data set of thirty seven GBCs, for a period of eight years (2000-2007). These data allow me to examine how the proportion of women directors is associated with financial performance.

In contrast to standard research based on publicly available data, I have also been allowed access to the detailed minutes of board and board-committee meetings for a period of one year for eleven of the Israeli GBCs. The calendar year studied was during the period 2007-2009 – for eight of the firms, calendar 2008. Nine of the eleven companies examined provided minutes of both board meetings and board-committees; the other two supplied only the former. These minutes aggregate to 4,758 pages, which document 402 meetings of the boards or their committees (155 and 247, respectively), in which – according to my tabulation – 2459 decisions were made or updates were given (1422 and 1037, respectively).

Using the content-analysis methodology (Krippendorff, 2004; Lieblich et al., 1998), which is a method that enables the transformation of texts into a quantitative database, I coded what happened at these meetings. The essentials of the coding guidelines are as follows:<sup>7</sup>

- a. **General information.** For each issue discussed I recorded the type of meeting (board/committee) at which it was discussed, and whether the issue was merely presented as an update or, alternatively, culminated in a decision made by the board.
- b. **Aggregate topic-subjects.** Each topic discussed or decision made in a board meeting or board-committee meeting was coded under one of the following five aggregate topic-

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<sup>7</sup> Complete and detailed coding guidelines may be obtained from the author.

subjects: audit and contracting, business issues, financial issues, formal issues, and personnel and benefits.

- c. **Decision in line with CEO.** For each decision made by the board, the decision was coded as either in line, partially in line, or not in line with the CEO's/management's proposal.
- d. **Further updates.** Cases in which the board requested to receive further information or an update on the subject discussed.
- e. **Taking an initiative.** When a board actively did something that was meant to improve the company, according to its own understanding, this was coded as a case in which the board took an initiative. For example: The board approved a lease it was asked to approve, yet decided to introduce a few revisions of details, or it took an active part in defining the steps/actions that should be taken. For example: A board delved into an issue presented to it, or one it actively requested be discussed, discussed the issue, and finally, formulated and adopted a new alternative policy.
- f. **Presentation of alternatives.** Cases in which the board was presented with at least two alternatives.
- g. **Dissension.** Cases in which a decision was made, and one or more of the board-members did not vote as the others (either opposing them or abstaining).
- h. **Board composition.** For each meeting, the total number of attending board-members was coded, along with the number of attending women directors, minority (Arabs) directors, and inside directors.<sup>8</sup>
- i. **Consistency.** All coding was done by the author.<sup>9</sup> To assure consistent standards, she reviewed all coding at least twice.

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<sup>8</sup> As mentioned, inside directors were defined as government employees and firm employees. The GCA board-representative was considered a government employee.

<sup>9</sup> This was due to the fact that the minutes are in Hebrew and, due to confidentiality, were made available only to the author and her doctoral advisors.

## 6 Findings

### 5.1. Gender and Firm Performance

This section examines Hypotheses 1a and 1b: Gender is/ is not associated with firm performance. In order to examine these hypotheses I analyze a panel data set of the 37 GBCs that operated during the years 2000-2007 or for a part of that period. In Table 2 I examine, via OLS regressions, whether the proportion of women directors is significantly associated with financial performance. Financial performance is measured (in alternative specification) by: EBITDA/ income (earnings before interest, taxes, depreciation, and amortization divided by annual income), EBITDA/ income in the following year, ROE (return on equity),<sup>10</sup> or ROE in the following year.

The independent variables included in all specifications are the proportion of women directors, the proportion of outside directors, the number of serving directors,<sup>11</sup> and whether the firm had a chairman on a fulltime basis, as opposed to it having a chairman who was only obligated to attend the meetings just as the other directors. All regression control for fixed effects across firms and include year dummies. Variables are further defined in List 1.

The results presented in Table 2 do not document a significant and consistent relation between the percentage of women directors and financial performance. Only in the specification in which ROE is the dependent variable (Regression 3) the proportion of women directors enters significantly, that only at the 10% level, and with a coefficient in the direction opposite that of the corresponding coefficient in the other specifications. Moreover, in a parallel set of regression (not reported) in which the number of women directors and the number of outside directors were included, rather than their proportion, the number of women directors did not enter significantly in any of the four specifications. Hence, for the data

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<sup>10</sup> I examine ROE rather than ROA because only data for ROE was available.

<sup>11</sup> These figures regarding proportions/number of directors include all directors who served for at least six months during each calendar year.

examined, no significant and consistent association is found between the proportion of women on board and firm performance.

Because a government holds a substantial equity interest in the firms examined, these firms are probably less aggressively profit-oriented than private firms. This is a certain limitation of the current study. Nevertheless, if the relation between the proportion of women directors and firm performance were significant and were one with a significant economic magnitude, our data should document a statistically significant relation, even if only of a relatively small economic magnitude (in comparison to that we may expect to find for private firms). However, such a statistically significant association is not documented.

In sum, although it may have been expected that the relatively large proportion of women directors on the boards examined would be significantly associated with financial performance, the data examined does not document such a relationship. Accordingly, Hypotheses 1a and 1b are both rejected.

## **5.2. Gender and the Working of Boards**

This section examines Hypotheses 2 and 3. The analysis is based on the data and methodology described in Section 5 – minutes of board meetings and board-committee meetings for a period of one year for eleven GBCs. As described, these minutes were coded on the level of each issue discussed (2459 issues) using the content-analysis methodology. Accordingly, the data coded allow an examination of the impact of women directors *in attendance* on what boards do. Women directors constituted a relatively large proportion of the boards examined: Panel 3 of Table 1 documents that on average, women directors consisted 37% the attendees at board and board-committee meetings.

### **5.2.1. Does Gender Engender Specialization?**

I start by examining the second hypothesis: Women and men each specialize/ have a propensity to conduct certain types of tasks – women directors specialize in tasks that entail monitoring and sustaining the corporate governance of the firm, while men directors specialize in business-oriented and tasks. This hypothesis is initially addressed by analyzing how the gender of the directors impacts upon what is discussed at board committee meetings – similarly to the examination prior studies have conducted. However, in contrast to extant studies, I am also able to examine how the gender of directors impacts upon what is discussed at board meetings. This kind of analysis allows me to distinguish between cases in which no intervention exists in directing women directors to certain types of tasks (board-meeting), and cases in which such an intervention exists (board-committee meetings).

The dependent variable examined is which of five aggregate topic-subjects (audit, business issues, financial issues, formal issues, and personnel and benefits) was discussed. To assure a robust analysis, I examine both a linear and a non-linear relation between the existence of women directors and what boards discussed, and use two alternative measures that document the presence of women directors: Regressions 1-3 in Table 3 assume a **linear** relation between the *proportion* of attending women directors and what was discussed; Regressions 4-6 in Table 3 assume a **non-linear** relation between the *number* of women directors and its square, and what was discussed.

As mentioned, the dependent variable is one of five aggregate topic subjects that were discussed. Accordingly, the analysis is conducted using multinomial logistic regressions that offer an appropriate method for examining dependent variables such as ours. The regressions control for whether the firm had a serving CEO at the time the issue was discussed, the number of attending outsiders, the number of attending directors, the percentage of attending directors with an MA/ MBA, and the average number of years of executive

experience of the attending board members.<sup>12</sup> Detailed definitions for all variables are provided in List 1.

Prior studies (surveyed in Section 3.2.1) suggest that women are appointed to committees that carry out the tasks that foster the wellbeing of the firm and its corporate governance, but not to the committees that are more likely to deal with the actual business of the firm. Of the five aggregate topic-subject categories used in this study, the audit category is the one that most resembles the type of tasks that prior studies have suggested that women directors have a propensity to carry out.<sup>13</sup> Accordingly, the audit aggregate topic-subject category is chosen as the base category to which the other aggregate topic-subjects are compared. The business issues aggregate topic-subject category is also of special interest, because it resembles most closely the type of committees to which (according to previous studies, surveyed in Section 3.2.1), men directors were most likely to be appointed.

The results of the multinomial regression are presented in Table 3. This table reports the odds ratio scale for the dependent variables that examine how the presence of women directors impact upon the likelihood that a certain topic-subject be discussed. The odds ratio scale is equal to  $\ln\left(\frac{\pi_i}{\pi_1}\right)$ ,  $\pi_i$  being the probability that each of the four non-base aggregate topic-subjects be discussed, and  $\pi_1$  being the probability that the base-group – the audit aggregate topic-subject, be discussed. Accordingly, an odd ratio scale larger than 1 documents a positive relation between a dependent variable and the independent one, whereas one that is smaller than 1 documents a negative relation.

In Regressions 1 and 2 in Table 3, which both examine data pertaining only to board-committee meetings (as opposed to board meetings), all odd ratio scales for the

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<sup>12</sup> This data was obtained from the c.v. and a detailed form each potential director must submit to the committee that oversees the nominations of directors of government companies. Based on this data, the average executive experience and higher education (MA/MBA) of all attending directors were calculated.

<sup>13</sup> The audit aggregate topic-subject category includes audit issues, and also contracting and purchases issues – mostly cases in which boards are requested to formally approve contracting and purchases proposed by the company's management.

proportion, or alternatively, the number of women directors, are smaller than 1. This indicates that the presence of women directors at board-committees increases the likelihood that boards will discuss audit issues, as opposed to discussing each of the other four aggregate topic-subjects. These findings seem to support the second hypothesis that predicts that women directors are more likely to specialize in tasks that entail monitoring. These findings are also in line with prior studies that examine the type of committees to which women directors are likely to be appointed.

However, Regressions 3 and 4, which examine how the proportion or number of women directors, respectively, impact upon what is discussed at *board meetings*, document an opposite pattern. In these regressions all odd ratio scales for the variables that examine how the proportion/ number of women directors impact upon the likelihood that a non-audit aggregate topic-subject be discussed are larger than 1. This indicates that at board meetings, the presence of women directors catalyzes the discussion of all four non-audit aggregate topic-subject. More specifically, both Regressions 3 and 4 document that the presence of women directors increased significantly (at the 1% level) the likelihood that business issues, as opposed to audit issues, be discussed. As Regression 4 indicates, adding one woman director increased by 25% the likelihood that business issues, as opposed to audit issues, be discussed.

These results are not consistent with the patterns documented in this study for board-committees, and posited by prior studies. The latter, which have only relied on board-committee appointments, have concluded that women directors are more likely to carry out tasks that foster the well-being of the firm, and the firm's ability to communicate its wellbeing, rather than the tasks which deal with the actual business of the company. In contrast, the findings of this paper suggest that women directors enhance discussions of business issues, as opposed to the more supervisory issues. The findings of this study point out that the type of committees for which each gender of directors is appointed, may well not be a

good indicator of the propensities of women directors, as opposed to men directors, to conduct certain types of tasks.

Table 4 presents a robustness examination. This table includes only observations which were categorized as either audit or business aggregate topic-subject issues. This kind of analysis allows examining the two “extremes” of the work of boards: monitoring, on the one hand, and being involved in business issues, on the other. Using logistic regressions I examine the association between the proportion of women directors and the likelihood that the board discuss business issues (which serves as the dependent variable), as opposed to discussing audit issues. These regressions control for the proportion of women directors in attendance, the number of attending directors, the percentage of attending directors with an MA/ MBA, the average number of years of executive experience of the attending directors, whether the firm had a serving CEO at the time the issue was discussed, and fixed effects across firms. Regression 1 in this table pertains to both board meetings and to board committee meetings. This regression does not document a significant relation between the proportion of women on boards, and the likelihood that business issues be discussed. As before, Regression 2, which pertains only to board-committee meeting, documents a positive relation between these variables, whereas Regression 3, which pertains only to board-meetings, documents a significant negative relation.

In sum, I reject the second hypothesis, which asserted that women directors have a relative propensity to conduct supervisory tasks while men have a relative propensity to carry out the business tasks. This findings suggest that if gender-propensities exist, then actually the opposite linkage exists: women enhance the discussion of business issues as opposed to the more supervisory issues.

### **5.2.2. The Impact of a Critical Mass**

This section examines the third hypothesis: boards with a critical mass, both of men and of women directors, will exert more effort and be more active. To address this hypothesis I examine the data described in the previous section, which consist of the 2459 issues discussed by the GBC boards examined. I analyze how actions boards can choose to take are impacted by the presence of a critical mass of each gender. Two actions that reflect whether a board is active and exerts effort are examined: (1) whether the board took an initiative, e.g., the board proposed that a certain action be taken, as described in Section 5e, and (2) whether the board requested to receive further information or an update. Because these dependent variables are binary, the analysis is conducted using logistic regressions.

All regressions (presented in Tables 5-6), include dependent variables that examine how the presence of a critical mass of at least three women directors and/ or a critical mass of at least three men directors impact upon the actions board take. In addition, the regressions include the following independent variables: the number of attending outsiders, the total number of attending directors, the percentage of attending directors with an MA/ MBA, and the average number of years of executive experience of the attending directors, whether the firm had a serving CEO at the time the issue was discussed, and a dummy indicating whether the issue was discussed at a board meeting (as opposed to it being discussed at a board-committee meeting). All regressions control for fixed effects across firms. Complete definitions of variables are provided in List 1.

First I examine a linear relation: how the percentage of women directors impacts upon the likelihood that boards take an initiative, or request to receive further information or an update (Table 5, Regressions 1 and 2, respectively). The results do not document a significant linear relation between the gender of directors and these actions. Furthermore, in a parallel set of regressions conducted as an examination of robustness (not reported), the number of women directors and their squares were included as independent variables, rather than the

percentage of women directors. In this analysis too, the number of women directors and their squares were not found to impact significantly upon the actions boards take. Nevertheless, as Regressions 1 and 2 in Table 5, indicate, a critical mass of women directors is positively associated with the extent a board is active. As the analysis shall demonstrate, this positive association remains robust also across other specifications.

I continue by examining whether the existence of a critical mass of at least three women directors in attendance impacts significantly upon the likelihood that boards take an action – i.e., that they take an initiative (Table 5, Regression 3), or request to receive further information or an update (Table 5, Regression 4). A parallel set of regressions is conducted which examines the impact of a critical mass of at least three attending men directors (Table 5, Regressions 5 and 6, respectively). Of Regressions 3-6, only Regression 4 documents a statistically significant impact of a critical mass: the odd ratio reported shows that boards that have critical mass of three women directors are 87% more likely to request to receive further information or an update, as compared to boards that do not have such a critical mass. This provides initial evidence that a critical mass of directors of a specific gender (in this case, of women directors) catalyzes a board's activeness.

Regressions 7 and 8 in Table 5 examine the impact of having critical masses (of at least three directors of each gender) of *both* men and women directors, which I shall refer to as a dual critical mass. As these regressions document, when a dual critical mass exists, a critical mass of women directors impacts significantly both upon the likelihood that the board take an initiative, and upon the likelihood that the board request further information or an update; a critical mass of men directors impacts significantly only upon the former. These results clearly indicate that having a dual critical mass increases the activeness of boards. The results also demonstrate that the impact of a critical mass of women directors is larger than the impact of a critical mass of men directors. For example, as Regression 7 in Table 5

indicates, having a critical mass of women directors increased the likelihood that the board take an initiative by 71%, whereas a critical mass of men directors, increased it “only” by 58%.

Regressions 1-4 in Table 6 further investigate the impact of a dual critical mass. These regressions include a dummy variable which equals 1 for cases in which a dual critical mass existed. Regressions 1-2 in Table 6 include all cases examined (i.e., both board meetings and board committee meetings). In these regressions a dual critical mass impacts positively, at the 10% level, both upon the likelihood that the board take an initiative and upon the likelihood that it request an update. However, having a dual critical mass requires that at least six directors attend (at least three men and three women), and in many cases less than six directors attend board-committee meetings. For this reason, Regressions 3-4 in Table 6 include only observations pertaining to board meetings (and not those pertaining to board committee meetings). Here, the results document that having a dual critical mass increases, at the 1% level, both the likelihood that the board take an initiative, and that it request further information or an update. These regressions show that boards with a dual critical mass were more than twice as likely to take an initiative and also to request further information or an update, compared to boards that did not have such a critical mass.

Last, Regressions 5-8 in Table 6 examine whether, perhaps, even only two directors of a certain gender might suffice to compose a critical mass that impacts significantly upon the actions boards take. As these regressions document, in most specifications having only two directors of each gender does not generate a significant impact. In addition, the economic magnitude of the effect of a critical mass that consist of only two directors of a certain gender is noticeably smaller than the magnitude documented for critical masses of three directors of a certain gender. These findings emphasize that a critical mass of three directors is required to generate a significant impact.

It may be noted that in additional regressions conducted (not reported), the presence of a critical mass of men and/ or of women directors (and also their percentage/ number) was not found to impact significantly upon the likelihood that boards vote against the CEO's proposal, or upon the likelihood that the board vote non-unanimously. This suggests that the presence of a critical mass of each gender impacts upon the effort the board exerts, rather than upon the likelihood that disagreement or dissension will emerge.

In sum, both genders were found to exert more effort when a critical mass of their own gender were in attendance. However, the highest levels of effort were exerted when a dual critical mass – at least three men and three women directors – was in attendance. These findings support the prediction of Kandel and Lazear (1992) that having a group of people with similar background (in our case, a group of the same gender) increases the effort exerted by the individual team-members. However, the findings also stress that with respect to gender, having a critical mass of *both* genders can catalyze the effort exerted by the team members, perhaps because peer monitoring between genders increases the overall level of peer monitoring, and accordingly, the level of effort exerted by all directors.

The conclusion that a dual critical mass impacts positively upon the productivity of boards falls in line with the evidence found by Adams and Ferreira (2009) and the argument made by Hoogendoorn et al. (2011): They find, respectively, that increasing the participation of women in settings in which women are marginally represented, or designing gender-balanced settings, increases peer monitoring. In sum, the findings presented in this section support the third hypothesis, that boards with a critical mass, both of men and of women directors, will exert more effort and be more active.

## **6. Summary**

This study, which examines relatively gender-balanced boards does not document a direct relation between the gender of directors and financial performance for the thirty-seven GBCs examined. Perhaps no significant association was documented because many mediating factors, such as the existence of complementing skills of each gender, peer monitoring by each of the genders, and communication between the genders, all impact upon financial performance.

I document that women directors do have a propensity to conduct certain types of tasks: the participation of women directors at board meetings significantly increased the likelihood that business issues be discussed, as opposed to audit issues. However, prior studies have documented that women directors tend to be more on board-committees that discuss audit issues than those that discuss business issues.

Last, I find that a dual critical mass – defined as the attendance of at least three women directors and three men directors – most enhances the activeness of boards. Boards with such a dual critical mass were found to be more than twice as likely both to take an initiative (e.g., suggest which action should be taken) and to request further information or an update, compared to boards that did not have such a critical mass. This suggests that when directors are surrounded by a sufficient number of directors of their own gender the intensity of peer monitoring and/ or communication increases. Hence, having just one or even two women directors on boards may not be sufficient to allow boards to benefit from how gender catalyzes the effort exerted by all directors.

Perhaps, future studies will have access to additional data that will allow further examination of the actual work of boards and their dynamics. Studies of this kind will enable the generation of a comprehensive understanding of the role of gender in the actual working of boards.

Figure 1  
**Women on Boards Worldwide**  
 Source: Catalyst, 2011

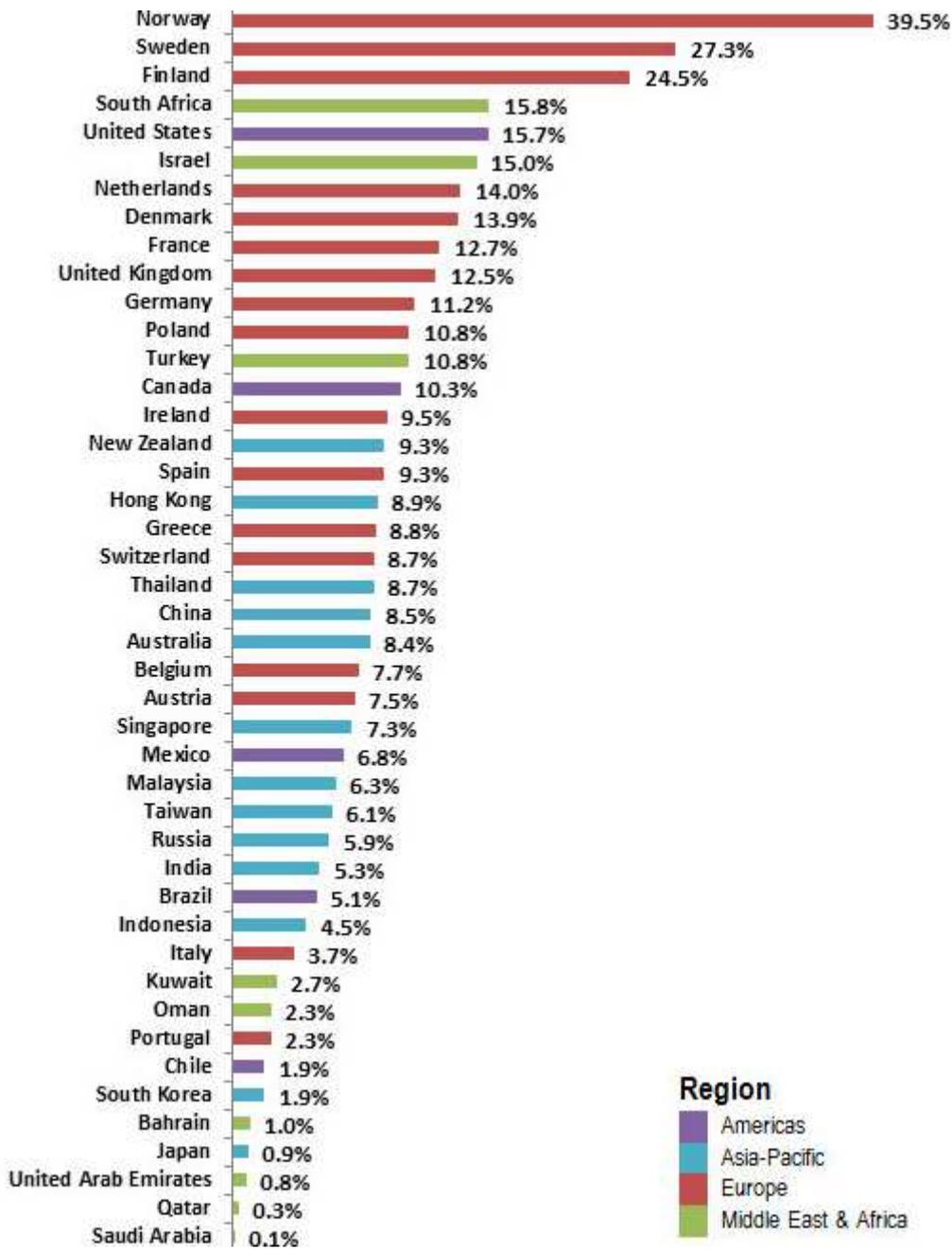


Table 1  
**Summary Statistics on Board Composition**

Panel 1

**Summary Statistics for the Firms whose Financial Performance was Examined**

This panel presents summary statistics on an annual level (2000-2007) concerning the board composition of all thirty-plus GBCs. All figures pertain to the number of directors who served for at least six months during each calendar year. All figures were calculated by the author based on data obtained from an internal database of the GCA.

	2000	2001	2002	2003	2004	2005	2006	2007	<b>Average 2000-2007</b>
<u>percentage of women directors</u>									
average	33%	32%	27%	27%	34%	35%	33%	31%	<b>32%</b>
median	33%	29%	27%	29%	30%	35%	35%	30%	<b>31%</b>
min	0%	13%	0%	0%	0%	0%	0%	0%	<b>2%</b>
max	60%	100%	50%	50%	100%	67%	60%	75%	<b>70%</b>
S.D.	15%	17%	13%	14%	22%	15%	15%	18%	<b>16%</b>
<u>size of board</u>									
average	6.43	7.50	11.14	9.71	8.29	8.10	8.10	8.40	<b>8.46</b>
S.D.	3.13	3.70	2.64	3.18	4.03	3.35	3.75	3.06	<b>3.36</b>
<u>percentage of outsiders</u>									
average	74%	69%	69%	66%	64%	65%	67%	62%	<b>65%</b>
S.D.	25%	23%	24%	27%	30%	27%	27%	28%	<b>30%</b>
number of firms	31	31	30	31	33	36	36	37	<b>33</b>

*continued on next page*

Table 1 – continued

Panel 2

**Summary Statistics on the Background of Board Members**

This panel compares the background of the directors serving on the boards of the eleven GBCs for which minutes were examined to the background of directors serving on boards of other types of firms. NA indicates data are not available.

	GBCs		Israeli listed companies		Norwegian listed companies		Swiss listed companies		American S&P 500	
	women directors	men directors	women directors	men directors	women directors	men directors	women directors	men directors	women directors	men directors
age	48	51	51	59	46	51	NA	NA	56***	60***
percent with executive experience*	52%	62%	79%	94%	51%	61%	3%	18%	49%	65%
have bachelor degree	100%	94%	90%	86%	56%	46%	91%	95%	NA	NA
have an MBA/MA degree	56%	44%	85%	78%	24%	22%	79%	84%	NA	NA
served or are serving on other boards	45%	44%	NA	NA	NA	NA	NA	NA	NA	NA
of these: non gvt./non-NGO boards	18%	22%	NA	NA	NA	NA	NA	NA	NA	NA
currently serving on a board of a listed firm	NA	NA	17%	18%	17%**	19%**	18%	31%	24%***	21%***
number of directors	50	86	684	3020	249	383	50	1628	NA	NA
percent of each gender	37%	63%	18%	82%	39%	61%	3%	97%	16%	84%
year examined	2008		2009		2009		2003		2010	
number of companies examined	11		100		113		269		500	
Source from which data was obtained from/used to calculate figure	GCA database		Israeli Stock Exchange Authority, 2010		Aherm and Dittmar, 2011		Ruigrok et al., 2007		Spencer Stuart US Board Index, 2010	

\* In most studies executive experience was defined as one of the following positions: CEO, an executive position in an organization - e.g., head of a functional unit, partner/principal, or vice president. However definitions vary across studies.

\*\* Figures pertain only to directors that their primary occupation is serving as directors.

\*\*\* Figure from Peterson and Philpot (2007), pertains to 2002 Fortune 500 boards.

continued on next page

Table 1 – *continued*

Panel 3

**Summary Statistics on Board Composition for the Firms whose Minutes were Examined**

This panel presents summary statistics on the board composition in attendance at board and board-committee meetings for the eleven GBCs of which minutes were examined. For each company, the minutes were coded for one calendar year (2007, 2008 or 2009); for eight of them, that year was 2008.

	board- meetings	board- committee meetings	board and board- committee meetings
average number of board-members in attendance	9.39	6.01	7.35
average percentage of women directors in attendance	36%	37%	37%
average percentage of outside directors in attendance	64%	71%	67%
number of cases with at least two women in attendance	989	689	1599*
number of cases with at least three women in attendance	770	329	1099*
number of cases with at least two men in attendance	1288	992	2280*
number of cases with at least three men in attendance	1198	616	1814*
number of firms examined	11	9	11
average number of meetings per firm	14.2	20.4	34.6
total number of meetings examined	155	247	402

\*out of a total of 2459 cases.

Table 2

**Gender and Firm Performance**

This table presents OLS regressions estimating how gender impacts upon firm performance. The panel data analyzed pertain to the universe of 37 GBCs operating during the years 2000-2007. The independent variables (proportion of women, proportion of outsiders, and number of directors) pertain to the number of directors who served for at least six months in each calendar year. The variable “Fulltime chairman” documents whether the firm had a chairman who was employed on a fulltime basis. All variables are further defined in List 1. For each variable, the first line presents the coefficient. The second line presents robust errors clustered on firm level. \*\*\*, \*\*, \*, indicate significance at the 0.01, 0.05, and 0.10 level, respectively.

	(1)	(2)	(3)	(4)
	EBITDA/ income	EBITDA/ income t+1	ROE	ROE t+1
proportion of women	-1.349 (1.991)	-1.628 (2.303)	.182* (.105)	-.013 (.120)
proportion of outsiders	1.843 (1.690)	1.353 (1.982)	-.126 (.085)	-.049 (.097)
number of directors	-.101 (.113)	-1.02 (.129)	-.015** (.006)	-.003 (.007)
fulltime chairman	-.415 (.649)	-.307 (.762)	.025 (.034)	.010 (.039)
firm fixed effects	yes	yes	yes	yes
year dummies	yes	yes	yes	yes
number of observations	236	203	238	208
number of groups (firms)	37	35	37	35
adjusted R-square	0.078	0.085	0.208	0.193
significance	0.051	0.060	0.000	0.000

Table 3

**Gender and Propensities to Conduct Certain Types of Tasks**

The data analyzed apply to the 2459 cases in which boards of the firms examined – eleven GBCs – either made a decision or received an update in a board meeting or a board-committee meeting. This table presents multinomial logistic regressions in which the dependent variables are the five aggregate topic-subject groups that document what boards discussed. The base group is the “audit and contracting” aggregate topic-subject category, and the non-base categories are formal issues, financial issues, business issues, and personnel and benefits. Apart from controlling for the presence of women directors (their proportion or number), all regressions control for the number of directors in attendance, for whether the company had a serving CEO at the time the issue was discussed, the average number of years of executive experience of the directors in attendance, the average percentage of directors with an MA/MBA and fixed effects across firms. Variables are further defined in List 1. For each variable, the first line presents the coefficient and the second line presents robust clustered errors on firm level (in parentheses). \*\*\*, \*\*, \*, indicate significance at the 0.01, 0.05, and 0.10 level, respectively.

	type of meeting	measure of attendance of women directors	formal issues	financial issues	business issue	personnel and benefits	observations	Pseudo R2
(1)	board committee meetings	proportion of women	.099** (0.095)	.077* (.117)	.218 (.230)	.085 (.145)	1146	.043
(2)	board committee meetings	number of women	.608** (.125)	.539 (.261)	.789 (.198)	.692 (.335)	1146	.057
		number of women squared	1.045 (.071)	.999 (.066)	.963 (.036)	.987 (.112)		
(3)	board meetings	proportion of women	3.28 (.259)	2.515* (1.29)	2.402*** (0.689)	3.085 (3.531)	1313	.0142
(4)	board meetings	number of women	1.238 (.184)	1.071 (.072)	1.25*** (.059)	1.317** (.161)	1313	.0224
		number of women squared	.982 (.025)	1.021 (.027)	.962*** (.012)	-.022 (.117)		

Table 4

**Gender and Propensities to Conduct Certain Types of Tasks – Robustness Exam**

This table includes only the cases in which the boards of the eleven GBCs examined discussed aggregate topic-subjects categorized either as business issues or as audit issues on the aggregate topic-subject level. Fixed effects across firms are controlled for. Variables are further defined in List 1. For each variable, the first line presents the coefficient and the second line presents robust clustered errors on firm level (in parentheses). \*\*\*, \*\*, \*, indicate significance at the 0.01, 0.05, and 0.10 level, respectively.

	business issue	business issue	business issue
	(1)	(2)	(3)
board and board-committees	yes	only board-committees	only board-meetings
proportion women directors	.522 (.361)	.207* (1.816)	2.598*** (.711)
number of board-members	.942 (.057)	.786** (.084)	.957 (.025)
average executive experience	1.017 (.061)	1.004 (.088)	1.036** (.018)
average MA	.308 (.260)	.202* (.167)	.729 (.386)
no serving CEO	1.031 (.244)	.853 (.206)	.854 (.280)
was board-committee meeting	8.886*** (1.814)		
number of observations	1,272	680	592
pseudo R 2	.174	.084	.009
significance	.000	.000	.0238

Table 5

**A Critical Mass of Women and/ or Men Directors**

This table presents logistic regressions analyzing the 2459 cases in which boards of the eleven GBCs examined took an initiative (e.g., suggested which action should be taken) or, in alternative specifications, requested to receive further information or an update. All variables are further defined in List 1. Fixed effects across firms are controlled for. For each variable, the first line presents the coefficient and the second line presents robust clustered errors (in parentheses). \*\*\*, \*\*, \*, indicate significance at the 0.01, 0.05, and the 0.10 level, respectively.

	initiative taken (1)	information requested (2)	initiative taken (3)	information requested (4)	initiative taken (5)	information requested (6)	initiative taken (7)	information requested (8)
proportion women directors	1.25 (.5713)	1.900 (1.105)						
three or more women directors			1.507 (0.416)	1.875** (.522)			1.712** (.468)	1.911** (.560)
three or more men directors					1.857 (.345)	.929 (.194)	1.582** (0.361)	1.077 (.222)
number of outsiders			.858*** (.044)	0.770*** (.065)	.877** (.052)	.778*** (.057)	0.861*** (.045)	.770*** (.064)
number of board-members	1.008 (.033)	1.084** (.041)	1.06** (.027)	1.203*** (.070)	1.080* (.046)	1.273*** (.077)	1.021 (.039)	1.196 (.072)
average executive experience	1.009 (.021)	1.030 (.035)	1.032* (.018)	1.063** (.025)	1.030 (.021)	1.068** (.021)	1.027 (.018)	1.062** (.025)
average MA	1.566 (.540)	2.170 (1.311)	1.121 (.344)	1.293 (.771)	1.195 (.375)	1.6487 (.918)	1.008 (.317)	1.272 (.775)
no serving CEO	1.863* (.451)	1.066 (.469)	1.946*** (.425)	1.143 (.448)	1.960*** (.352)	1.068 (.397)	2.072*** (.394)	1.155 (.433)
was board-committee meeting	.525** (.163)	2.60*** (.067)	-.548*** (.163)	.261*** (.059)	.495** (.145)	.255** (.066)	.498*** (.131)	2.58*** (.061)
board and board-committees	yes	yes	yes	yes	yes	yes	yes	yes
number of observations	2,459	2,459	2,459	2,459	2,459	2,459	2,459	2,459
pseudo R 2	0.246	.0586	.320	.0756	.030	.067	.358	.0757
significance	.000	.000	.000	.000	.000	.000	.000	.000

Table 6

**A Critical Mass of Women and/ or Men Directors – Further Analysis**

This table presents logistic regressions analyzing the 2459 cases in which boards of the eleven GBCs examined took an initiative (e.g., suggested which action should be taken) or, in alternative specifications, requested to receive further information or an update. All variables are further defined in List 1. Fixed effects across firms are controlled for. For each variable, the first line presents the coefficient and the second line presents robust clustered errors (in parentheses). \*\*\*, \*\*, \*, indicate significance at the 0.01, 0.05, and the 0.10 level, respectively.

	initiative taken (1)	information requested (2)	initiative taken (3)	information requested (4)	initiative taken (5)	information requested (6)	initiative taken (7)	information requested (8)
critical masses of three men and three women	1.969* (.709)	1.722* (.546)	2.268** (.882)	2.14*** (.534)	1.374 (.345)	1.574** (.294)		
two or more women directors					1.261 (.324)	.887 (.192)		
two or more men directors							1.305 (.346)	1.373* (.253)
critical masses of two men and two women							.863*** (.040)	.775*** (.058)
number of outsiders	.866*** (.043)	.780** (.058)**	1.016 (.083)	.788* (1.07)	.858*** (.042)	.764*** (.061)		
number of board-members	1.022 (.037)	1.196** (.073)	.921*** (.024)	1.13 (.090)	1.072*** (.021)	1.240** (.708)	1.076*** (.020)	1.238*** (.068)
average executive experience	1.022 (.037)	1.063** (.028)	.908 (.061)	1.12* (.065)	1.037* (.021)	1.075*** (.027)	1.035* (.019)	1.069*** (.026)**
average MA	1.028 (.018)	1.430 (.866)	3.408** (.018)	4.094 (4.060)	1.040 (.297)	1.285 (.732)	1.091 (.311)	1.394 (.810)
no serving CEO	1.086*** (.320)	1.116 (.418)	1.752** (.434)	1.317 (.3025)	1.904*** (.366)	1.088 (.414)	1.895*** (.371)	1.085 (.406)
was board-committee meeting	.540** (.142)	.256*** (.056)			.549** (.161)	.267*** (.065)	.543** (.161)	.259*** (.058)
board and board-committees	yes	yes	only board	only board	yes	yes	yes	yes
number of observations	2,459	2,459	1,313	1,313	2,459	2,459	2,459	2,459
pseudo R 2	.035	.0721	.044	.0517	.035	.072	.030	.069
significance	.000	.000	.000	.000	.000	.000	.000	.000

## List 1

**Definitions of Variables for Tables 2-6**

<b>Name of variable</b>	<b>Definition</b>
<b>Dependent variables</b>	
EBITDA/ income	Earnings before interest, taxes, depreciation, and amortization, divided by annual income.
EBITDA/ income t+1	The EBITDA/income ratio for the preceding year.
information/ update requested	A binary variable which equals 1 in cases in which the board requested to receive further information or updates.
ROE	Return on equity. i.e., net income divided by shareholders' equity.
ROE t+1	Return on equity for the preceding year.
take an initiative	A binary variable which equals 1 in cases in which the board took an initiative, e.g. proposed an action should be taken. This variable is further described in Section 5e.
<b>Independent variables</b>	
average executive experience	The average number of years of executive experience of the attending board members.
average MA	The percentage of attending directors with an MA/ MBA.
critical masses of three men and three women	A dummy which equals 1 in cases in which at least three women directors and three men directors were in attendance, and 0 otherwise.
critical masses of two men and two women	A dummy which equals 1 in cases in which at least two women directors and two men directors were in attendance, and 0 otherwise.
fulltime chairman	A dummy which equals one for firms that had a chairman on a fulltime basis, as opposed to firms that had a chairman who was only obligated to attend the meetings just as the other directors.
no serving CEO	A dummy which equals 1 if at the time the topic-subject was discussed the company had no CEO, and 0 if it had a serving CEO.
number of directors	For Table 2: The number of directors who served at least six months in a given calendar year.* For Tables 3-6: The total number of board-members in attendance.
number of outsiders	The actual number of outside board-members in attendance.
number of women	The actual number of women directors in attendance.
number of women squared	The square of the number of women directors in attendance.

*continued on next page*

List 1 - *continued*

<b>Name of variable</b>	<b>Definition</b>
<i>Dependent variables (continued)</i>	
proportion of outsiders	Out of all directors who served at least six months in a given calendar year, the proportion of outsiders.
proportion of women	For Table 2: Out of all directors who served at least six months in a given calendar year, the proportion of women.* For Tables 3-6: Out of all directors in attendance, the proportion of women.
three or more men directors	A dummy which equals 1 in cases in which three or more men directors were in attendance and 0 otherwise.
three or more women directors	A dummy which equals 1 in cases in which three or more women directors were in attendance and 0 otherwise.
two or more men directors	A dummy which equals 1 in cases in which two or more men directors were in attendance and 0 otherwise.
two or more women directors	A dummy which equals 1 in cases in which two or more women directors were in attendance and 0 otherwise.
was board-committee meeting	A dummy which equals 1 in cases the meeting at which the topic-subject was discussed was a board meeting, and 0 if it was a board-committee meeting.

\* Calculated by author based on data from an internal database of the GCA.

## Bibliography

- Adams, Renee B. and Daniel Ferreira, 2009. Women in the Boardroom and Their Impact on Governance and Performance, *Journal of Financial Economics*, 94(2), 291-309.
- Adams, Renee B. and Patricia Funk, 2011. Beyond the glass ceiling: Does gender matter?, Working Paper.
- Ahern, Kenneth R. and Amy K. Dittmar, 2011. The Changing of the Boards: The Value Effect of a Massive Exogenous Shock. Working Paper.
- Apesteguia, Jose, Ghazala Azmat, and Nagore Iriberry, 2011. The Impact of Gender Composition on Team Performance and Decision-Making: Evidence from the Field, *Management Science*, forthcoming.
- Becker, Gary, 1957. *The Economics of Discrimination*, Chicago: University of Chicago Press.
- Bilimoria, Diana and Sandy Kristin Piderit, 1994. Board Committee Membership: Effects of Sex-Based Bias, *The Academy of Management Journal* 37(6), 1453-1477.
- Boone, Audra L., Laura Casares Field, Jonathan M. Karpoff, and Charu G. Raheja., 2007. The Determinants of Corporate Board Size and Composition: An Empirical Analysis, *Journal of Financial Economics* 85, 66–101.
- Carter, David A., Simkins, Betty J. and Simpson, W. Gary, 2003. Corporate Governance, Board Diversity, and Firm Performance. *The Financial Review* 38, 33-53.
- Chemmanur, Thomas J. and Viktor Fedaseyev, 2011. A Theory of Corporate Boards and Forced CEO Turnover, Unpublished Manuscript, Boston College.
- Coles, Jeffrey L., Naveen D. Daniel, and Lalitha Naveen, 2008. Boards: Does One Size Fit All?, *Journal of Financial Economics* 87(2), 329-356.
- Craig A. Peterson and James Philpot, 2007. Women's Roles on U.S. Fortune 500 Boards: Director Expertise and Committee Memberships, *Journal of Business Ethics* 72, 177–196.

- Dalton, Dan R., Catherine M. Dailey, Jonathan L. Johnson and Alan E. Ellstrand, 1998. Meta-Analytic Reviews of Board Composition, Leadership Structure, and Financial Performance, *Strategic Management Journal*, 19(3), 269-290.
- Dalton, Dan R., Catherine M. Daily, Jonathan L. Johnson and Alan E. Ellstrand, 1999. Number of Directors and Financial Performance: A Meta-Analysis, *The Academy of Management Journal*, 42(6), 674-686.
- Edward Lazear, 1999. Globalization and the Market for Team-mates, *The Economic Journal* 109, C15-C40.
- Erhardt, Niclas L., James D. Werbel and Charles B. Shrader, 2003. Boards of Director Diversity and Firm Performance, *Corporate Governance: An International Review* 11(2), 102-11.
- Farrell, Kathleen A., and Philip L. Hersch, 2005. Additions to corporate boards: The effect of gender, *Journal of Corporate Finance* 11, 85-106.
- Ferreira, Daniel, 2010. Board Diversity, published as a chapter in: Anderson, R. and Baker, H.K., *Corporate Governance*, 225-242, Wiley and Sons.
- Government Companies Authority (Israel), *Annual Reports on the Government Companies*, 1997-2007.
- Greene, William, 2008. *Econometric Analysis*, 6<sup>th</sup> Edition, Upper Saddle River, New Jersey: Prentice Hall.
- Hamilton, Barton H., Jack A. Nickerson, Hideo Owan, 2004. Diversity and Productivity in Production Teams, Working Paper.
- Hermalin, Benjamin E. and Michael S. Weisbach, 2003. Boards of Directors as an Endogenously Determined Institution: A Survey of Economic Literature, *Economic Policy Review* 9(1), 7-26.
- Hoogendoorn, Hessel Oosterbeek, and Mirjam van Praag, 2011. The Impact of Gender Diversity on the Performance of Business Teams: Evidence from a Field Experiment, *Tinbergen Institute Discussion Paper* 074/3.
- Israeli Stock Exchange Authority, 2010. Women on Boards (in Hebrew), [http://www.isa.gov.il/Download/IsaFile\\_5625.pdf](http://www.isa.gov.il/Download/IsaFile_5625.pdf).

- Kesner, Idalene F., 1988. Directors' Characteristics and Committee Membership: An Investigation of Type, Occupation, Tenure, and Gender, *The Academy of Management Journal* 31(1), 66-84.
- Kramer, Vicki W., Alison M. Konrad, and Sumru Erkut, 2006. *Critical Mass on Corporate Boards: Why Three or More Women Enhance Governance*, Wellesley Center for Women, Report No. WCW 11.
- Krippendorff, Klaus 2004. *Content Analysis: An Introduction to Its Methodology*, Thousand Oaks, CA: Sage Publications.
- Lieblich, Amia, Rivka Tuval-Mashiach, and Tamar Zilber, 1998. *Narrative Research: Reading, Analysis, and Interpretation*, Thousand Oaks, CA: Sage Publications.
- Matza, David A., and Amalia R. Miller, 2011. A Female Style in Corporate Leadership? Evidence from Quotas. Working Paper.
- Rhode, Deborah L. and Amanda K. Packel, 2010. *Diversity on Corporate Boards: How Much Difference Does Difference Make?*. Rock Center for Corporate Governance, Stanford University.
- Rosener, Judy B., 1995. *America's Competitive Secret: Utilizing Women as a Management Strategy*. Oxford University Press. New York.
- Ruigrok, Winfried, Simon Peck and Sabina Tacheva, 2007. Nationality and Gender Diversity on Swiss Corporate Boards, *Corporate Governance* 15(4), 546-557.
- Shrader, Charles B., Virginia B. Blackburn, and Paul Iles, 1997. Women in management and firm financial performance: An exploratory study. *Journal of Managerial Issues* 9, 355-372.
- Spencer Stuart, 2010. *Spencer Stuart Board Index*, Chicago: Spencer Stuart.
- Wooldridge, Jeffrey M., 2009. *Introductory Econometrics: A Modern Approach*, 4<sup>th</sup> ed. Mason, Ohio: South-Western Cengage Learning.