Gender Diversity in the Boardroom

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Abstract

This paper documents several significant correlations between the variability of stock returns, the structure of director compensation, and the gender diversity of corporate boards. In a cross-sectional sample of boards of directors of 1024 publicly traded firms in fiscal year 1998, we find three robust results: (1) firms facing more variability in their stock returns have fewer women on their boards of directors, (2) firms with more diverse boards provide their directors with more pay-performance incentives, and (3) firms with more diverse boards hold more board meetings. We provide an explanation for these findings, based on the idea that board diversity affects directors' incentives to work cooperatively. We also find that female directors have fewer attendance problems at board meetings, which suggests that diverse boards can be more effective than homogeneous boards.

Keywords: Board of Directors; Board Compensation; Gender; Diversity

JEL Classifications: G30, G34, J16

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1 Introduction

Recent proposals for governance reform stress the importance of gender diversity in the boardroom. One argument for this is that boards could enhance their effectiveness by tapping broader talent pools for their directors. The Higgs Review (Higgs, 2003), for example, points out that although approximately 30% of managers in the UK corporate sector are female, women hold only 6% of non-executive director positions. More diverse boards may also have better relations with customers, suppliers and employees (e.g. Ellis and Keys, 2003). However, organizational scholars have also pointed out that diverse top management teams may disagree more (Eisenhardt, Kahwajy and Bourgeois, 1997). To increase board effectiveness it may not be enough to simply increase the number of female directors on the board; diverse boards may require additional mechanisms to ensure cooperation between directors. In this paper, we provide strong empirical evidence consistent with the hypothesis that diversity affects incentives in boards. We also show that firms appear to take the effect of diversity on incentives into account when choosing the gender composition of their boards.

Kanter (1977) was one of the first to put forth the idea that changing the gender composition of top management teams may have implications for organizational design. In chapter 3 of her book, *Men and Women of the Corporation*, she argues that homogeneous top management teams cooperate more, because social similarity breeds trust. Diverse teams require additional mechanisms to induce cooperation. When other, more objective, mechanisms of control are not easily available, trust is a more important mechanism of team governance. As a result, she argues that when uncertainty is high, firms rely more on the homogeneity of the managerial team than on formal governance mechanisms as a means of providing incentives. Kanter's intuition is that when uncertainty is high, explicit pay-performance contracts are too costly; therefore group homogeneity is more valuable. In the context of boards, which are traditionally composed primarily of men, high uncertainty will lead the board to elect a higher proportion of male directors than female directors.

We call the hypothesis that uncertainty and diversity are negatively related, and thus incentive pay and group homogeneity are substitutes, *Kanter's conjecture*. We examine this relationship in a cross-sectional sample of data on boards of directors of 1024 publicly traded firms in fiscal year 1998. Our first empirical finding is that firms facing more variability in their stock returns have fewer women on their boards of directors. This can be interpreted as empirical support for Kanter's conjecture. Our second finding is that firms with a greater proportion of women on their boards provide a greater part of their compensation to directors in the form of restricted shares; they reduce the relative importance of the fixed salary and keep the fraction of stock options relatively constant. This implies that more diverse firms will provide their directors with more pay-performance incentives. Together, these two pieces of evidence suggest that incentive pay and board homogeneity are substitutes.

"The Tyson Report" (Tyson, 2003, p. 7) on the recruitment and development of non-executive directors, commissioned by the British Department of Trade and Industry, suggests that one cost of increasing diversity in the boardroom is the need to train directors to trust one another. An additional cost may be that decision-making is slower because, as Blau (1977) argues, heterogeneity in groups can increase conflict. Consistent with these ideas, we find that boards with a higher proportion of female directors have more board meetings. On the other hand, we also document that female directors have a different attendance patterns at board meetings from their male counterparts, which suggests that diverse boards can be more effective than homogenous boards. Our combined evidence suggests that gender composition plays an important role in compensation and organization design for corporate boards.

Although the issue of gender diversity is becoming more important in the policy debate, there is still relatively little research linking diversity and corporate governance (for a survey of this literature, see Fields and Keys, 2003). Carter, Simkins and Simpson (2003) document a positive relationship between gender and ethnic diversity of the board and corporate performance, as proxied by Tobin's Q. Although they do not focus on the board of directors, Ellis and Keys (2003) find evidence consistent with the idea that the market values workplace diversity. They document a positive stock price reaction following the announcement of diversity-promoting actions. Farrell and Hersch (2004) find that gender systematically impacts the selection of directors to the board. However, when they examine the market's reaction to the announcement of the addition of female directors, the abnormal returns are insignificant. Rather than being performance based, they argue that their evidence is consistent with the idea that female directors are added to the board following internal or external calls for diversity. Our paper complements these by providing evidence consistent with the idea that gender diversity may affect directors' incentives to work cooperatively. Adding women to the board, therefore, may not necessarily increase board effectiveness.

Westphal and Zajac (1995) examine the relationship between boardroom diversity and *CEO* compensation. Using Kanter's (1977) arguments, Westphal and Zajac (1995) argue that interpersonal trust between the CEO and the board should be higher and the CEO's contingent pay should be lower when the board and the CEO are demographically similar. Using measures of similarity of functional background, educational background and insider/outsider status, they find evidence consistent with this hypothesis.[3] The evidence in our paper is consistent with theirs, although we focus on the gender diversity of the board and director incentives.

More generally, our paper contributes to the literature on the demography of organizations, which has been studied primarily by researchers in management and organizational behavior. Pfeffer's (1983) concept of organizational demography deals with the description of organizations "in terms of their sex composition, their racial composition, their age or length of service distributions, the educational level of their work forces, the socioeconomic origins of their members, and so forth" (p. 303). Empirical papers in this tradition have looked both at the effects of demography on outcomes and at the determinants of demography in organizations (Haveman, 1995; O'Reilly, Caldwell, and Barnett, 1989; Pelled, Eisenhardt, and Xin, 1999; Wagner, Pfeffer, and O'Reilly, 1984).

Economists on the other hand have focused mainly on gender or race through the development of economic theories of discrimination, which are either taste-based (Becker, 1957) or statistical (Phelps, 1972; Coate and Loury, 1993). One of the few economics papers in which diversity matters is Athey, Avery and Zemsky (2000), which analyzes the phenomenon of the "glass ceiling." In this paper, the authors model discrimination in promotion decisions within firms by assuming that mentoring relationships are more likely to occur between members of the same group. Therefore, a more homogeneous (less diverse) work force leads to more mentoring interactions between entry- and upper-level employees.

Luttmer (2001) and Costa and Kahn (2003) use demographic variables to empirically proxy for the extent to which individuals identify with other members of a group, which they term group loyalty. Luttmer (2001) examines the effect of group loyalty on individuals' taste for redistribution. He finds that individuals increase their support for welfare spending as the share of local recipients from their own racial group rises. Costa and Kahn (2003) analyze the role of group loyalty in the provision of incentives by the military during the Civil War. They find that group loyalty played an important role in preventing shirking (desertion). They also suggest that group loyalty and incentive pay may be substitutes: "A distinguishing characteristic between the military and the modern firm is the military's inability (except for a mercenary army) to fully compensate individuals for risk and to link pay to performance. In an organization where workers have discretion and unobserved effort matters, altruism for others and the need for others' respect will mitigate the agency problem." Since formal incentive schemes provided by the military during the Civil War were virtually non-existent, they do

[3] Bryan, Nash and Patel (2003) do not find a significant relationship between board diversity and CEOs' contingent pay. However, their analysis differs from Westphal and Zajac's (1995) because they focus on excess contingent pay, and they do not examine the similarity between the board and the CEO.

not analyze the relationship between the two instruments. Our paper is thus complementary to theirs since our focus on for-profit corporations enables us to explicitly relate formal incentive schemes and diversity.[4]

The paper is organized as follows: In section 2, we discuss the main hypotheses. Section 3 describes the data. We discuss our empirical findings relating the gender diversity of the board to formal incentive schemes in section 4. In section 5, we examine if gender diversity in the boardroom affects how directors work. In section 6, we compare the attendance records of female and male directors. Section 7 discusses policy implications of our analysis and concludes.

2 Theoretical Arguments

The main issue we wish to investigate in this paper is whether changes in the gender composition of the board affects directors' incentives to work cooperatively. Since data on the inner workings of corporate boards is unobtainable, we cannot provide direct evidence on director interaction. However, we can provide indirect evidence on this issue by examining the relationship between diversity and formal incentive schemes. Our goal is to document not only that they are related, but also to provide some qualitative assessment of the nature of their relationship. To do this, we build upon Kanter's (1977) intuition that changes in the cost of providing formal incentive schemes, which can be proxied by uncertainty, will lead to changes in the extent to which both diversity and formal incentive schemes are used to induce effort. Consistent with the social psychology literature (e.g. Byrne, 1969; Lott and Lott, 1965; Zander, 1979) and the papers by Luttmer (2001) and Costa and Kahn (2003), we assume that increasing diversity decreases directors' identification with other board members, and hence their willingness to work together. This suggests that directors' incentives can be affected both by contingent pay and by homogeneity in board composition. Intuition suggests that these two instruments are substitutes: if incentive pay is very costly, the firm may want to rely more on board homogeneity as a means of providing incentives, and vice-versa. In this case, incentive pay is negatively related to homogeneity, while uncertainty (the cost of providing incentive pay) should be positively related to homogeneity. Thus we have the following hypothesis:

Hypothesis *Incentive pay and board homogeneity are substitutes. In this case, one should find that*

[4] Our paper also contributes to two other literatures: the literature on incentives and the governance literature on corporate boards. Since these literatures have been extensively reviewed elsewhere, we do not discuss them here. For a discussion of incentives in organizations, see Gibbons (1998) and Prendergast (1999). For a review of the economic literature on boards, see Hermalin and Weisbach (2003).

Ha *Firm performance variability (risk) and the gender diversity of the board should be negatively related;*

Hb *Incentive pay for directors and the gender diversity of the board should be positively related.*

This hypothesis is a version of Kanter's conjecture. Although Kanter (1977) did not formalize it, it follows from her (implicit) assumption that formal incentive mechanisms and group homogeneity are substitutes.[5] To provide a qualitative assessment of the nature of the relationship between diversity and incentive pay, our empirical strategy will be to regress diversity on risk (and other controls) and incentive pay on diversity *and risk* (since we are concerned about the *partial* effects of diversity on incentive pay, keeping risk constant).

3 Data

Our initial sample contains detailed firm-, board- and director-level data, including the gender composition of the board, for all Fortune 500 firms (excluding utilities and financial firms) in fiscal year 1998. Data from previous years were also used to construct measures of volatility. The sources for the data were proxy statements, Compustat, CRSP, ExecuComp, Moody's Manuals and firms' web sites. The final sample consists of complete data on 327 firms.

We expanded this initial sample by adding firms from the ExecuComp database for which at least some data on directors' compensation was available in fiscal 1998. The resulting sample consists of complete financial and director compensation data for 1024 firms in 1998.

For all firms not in the initial sample, we had to identify the gender composition of the board. To do this, we looked for the names of the directors in the 1999 "Directory of Corporate Affiliations" and inferred the directors' genders from their first names. In order to minimize errors, we used many name dictionaries, including some language-specific ones (English, Hebrew and Arabic). Still, some ambiguities remained, especially in cases where first names were abbreviated. We were able to unambiguously determine a directors' sex for 6700 out of 10255 directors. When a given director's gender could not be inferred from his/her name, we attribute the sample mean proportion of women to that director, instead of 1 (woman) or 0 (man).

In most of our analysis, we use a simple measure of gender diversity, which is the fraction of female

[5] Of course, board homogeneity and incentive pay may also be complements. Given our assumptions, board homogeneity will increase total effort levels for any given incentive scheme. Therefore, more homogeneity should increase directors' sensitivity to monetary incentives, which may lead to complementarities between the two instruments. In this case, we should expect to see that incentive pay is positively related to board homogeneity, while uncertainty (the cost of providing incentive pay) is negatively related to homogeneity.

directors on the board. As one can see from Table 1, few women sit on boards. On average, only about 8% of directors are women, with the proportion of women ranging from zero to 50%. This is consistent with Farrell and Hersch (2004), who find that female directors comprise 8.6% of board members in a sample of approximately 300 unregulated Fortune firms over the period 1990 to 1999. Although it focuses on large firms, the 1999 Catalyst census of female directors documents only about 10% female directors in the Fortune 1000 (Catalyst, 1999).

In order to test the relationship between diversity and risk, we need a measure of firm risk that affects directors' compensation. Since director pay is tied to firm performance primarily through stock ownership, we use the standard deviation of monthly stock returns as a proxy for firm performance risk, as in the literature on CEO compensation (e.g. Aggarwal and Samwick, 1999). We compute this standard deviation using monthly stock returns from CRSP from 1993 to 1998.

Approximately 80% of the firms in our sample granted shares and/or options to their directors. These shares and options almost always come with restrictions. Although restrictions vary across firms, a typical restriction is that directors cannot sell their shares until they leave the firm. Options usually come with vesting requirements and they may or may not be exercisable if the director leaves the firm.[6]

To examine the relationship between diversity and incentive pay, we need to value the shares and options granted to directors. ExecuComp estimates the value of options granted to the top five executives in each firm, but it does not provide the value of directors' options.

Although restricted shares should not have the same value as ordinary shares and options with different vesting requirements should be valued differently, restrictions vary too much across firms to justify any simple adjustment procedure. Thus, we follow the conventional practice (e.g. Jensen and Murphy, 1990; Aggarwal and Samwick, 1999) and ignore all restrictions and vesting requirements and assume that options and shares are priced as if they had no restrictions.[7] However, one should keep in mind that the estimates of total compensation are biased upwards, or that they can be best interpreted as an upper bound on actual total compensation.

The procedure we use to value options is chosen to be as close as possible to ExecuComp's procedure for valuing options for the top five executives in each firm. To price the options we use the Black-

[6] For example, American Home Products Corporation's proxy statement states "the options become exercisable at the date of the next annual meeting or earlier in the event of the director's termination of service, provided that the optionee has completed at least 2 years of service as a director at the time of exercise or termination."

[7] Hall and Murphy (2002) show how undiversified executives will value their stock options and restricted shares less than the value implied by usual option-pricing formulas (such as Black-Scholes). In their simulations, they show that the gap between true values and Black-Scholes values can be quite substantial.

Scholes formula, assuming continuously-paid dividends. Estimates of firm volatility, dividend-yield and the risk-free rate are from ExecuComp. Expiration usually occurs in ten years; we use seven years to be consistent with ExecuComp.

In most firms the exercise price of an option is the stock price on the date of grant. Since directors are generally elected at the annual meeting of the shareholders, the majority of firms grant their directors shares and options at the annual meetings. Thus, we use the market price of shares at the end of the month of each firm's annual meeting at the beginning of the 1998 fiscal year as the exercise price of the options, as well as the price of the stock.[8]

In our analysis we use a market-based measure of performance, a proxy for Tobin's Q, as well as an accounting measure, return on assets (ROA). Our proxy for Tobin's Q is the ratio of the firm's market value to its book value. The firm's market value is calculated as the book value of assets minus the book value of equity plus the market value of equity. ROA is the ratio of net income before extraordinary items and discontinued operations to its book value of assets.

Table 1 provides summary statistics for all variables used in this paper. As is evident from the table, a substantial fraction of directors' compensation is composed of restricted shares and stock options (about 45% of total compensation, on average).

4 Empirical Results

Here we briefly summarize our findings concerning the relationship between gender diversity in the boardroom, risk and incentive pay. The details can be found in the sections that follow.

In order to test our hypothesis, we first estimate the probability that a director is female as a function of firm risk. The estimated probability can be seen as a measure of diversity. We find a very strong and robust negative relationship between diversity and risk. This finding is consistent with Kanter's conjecture that group homogeneity and incentive pay are substitutes. We also show that other competing explanations do not seem to fit the evidence as well as this simple explanation does. Section 4.1 discusses the empirical tests in greater detail.

This finding alone is not a definitive test of our hypothesis. For that, we must also find a positive relationship between gender diversity and incentive pay. In section 4.2, we present results showing that firms with a larger fraction of female directors use restricted shares as a greater part of their compensation to directors; they reduce the relative importance of the fixed salary and keep the fraction

[8] Using the stock price at the end of the month of the annual meeting also ensures we do not introduce outliers in the value of options and stock due to stock splits, which go into effect between the end of fiscal year 1997 and the annual meeting.

of options more or less the same. This implies that boards with a greater fraction of female directors will provide their directors with more pay-for-performance incentives.

These two results together are in accordance with our hypothesis.

4.1 Risk and Diversity

We start our analysis using the subsample of 6700 directors to whom we could unambiguously assign a gender. In this subsample, we estimate grouped-data probit regressions, in which the dependent variable is an indicator variable, which equals 1 when the respective director is a woman and 0 if the director is a man, and the main explanatory variable is firm risk. Thus, we estimate:

$$\Pr\left(d = woman\right) = \Phi\left(\boldsymbol{\beta}'\mathbf{X}\right), \tag{1}$$

where $\mathbf{X}$ is a vector containing firm risk and other firm and board characteristics, $\boldsymbol{\beta}$ is a vector of coefficients and Φ is the standardized normal cumulative distribution function.[9] In all specifications, we include two-digit SIC code dummies to control for industry specific effects. We adjust all standard errors for heteroskedasticity and group correlation amongst directors from the same firm using a robust variance-covariance matrix. In square brackets beneath the z-statistics, we report the "slope," which is the marginal effect of an infinitesimal increase in the respective independent variable on the probability that a director is a woman, calculated at the means of the data. These numbers are useful to assess the economic significance of the estimated effects. We interpret the estimated probability as a measure of diversity.

Column I of Table 2 shows our estimate with industry dummies as the only control variables.[10] The effect of firm risk on diversity is negative and statistically significant (at less than the 1% level). Moreover, this effect is economically significant, in the sense that changes in risk lead to changes in gender diversity, which are substantial if compared to observed levels of diversity, but not implausibly large. An increase in risk of one standard deviation decreases the probability that a director is female by approximately 2 percentage points $(0.42 \cdot (-0.47))$. If a firm initially has 8% female directors (which is roughly the sample mean), this would imply a reduction of 25% in the proportion of women on its board.[11]

[9] In a previous version of the paper, we also presented the results of regressing the fraction of female directors on firm risk and the same control variables using OLS. The results from those regressions were consistent with the results of the probit regressions. In all cases, the coefficient on firm risk was negative and significant at less than the 0.001 level. Since the linear regression cannot account for the fact that the fraction of female directors is restricted to lie between 0 and 1, we focus on the probit here.

[10] The probit regressions use 6648 instead of 6700 observations because several industry dummies predict the outcome perfectly.

[11] Other thought experiments can be useful in understanding the magnitudes here. Consider a firm which initially has

To ensure that our results are not driven by misspecification of the empirical model, we ran many different specifications using other variables as controls. We report a subset of these regressions in columns (II) to (IV) of Table 2. In column (II), we control for other variables that may affect the proportion of women on boards. Columns (III) and (IV) include additional variables we use to address potential alternative explanations in the next section.

To ensure that our result is not driven by the mechanical effect board size may have on the probability that a director is female, we include board size in column (II). As expected, it enters positively in the regression, but its estimated coefficient is not statistically significant. This is consistent with Farrell and Hersch (2004), who find that board size does not significantly influence the number of female directors added to the board in a given year.

Profitability may also affect the proportion of women on boards. We include one measure of firm value (Tobin's Q) to control for expected performance, and one accounting measure of performance (return on assets - ROA) to control for current profitability. Column (II) displays the results. The estimated coefficient on firm risk is essentially unaffected by the inclusion of the profitability variables. Tobin's Q is positively and significantly correlated with the proportion of women on boards. This suggests that firms with many future investment opportunities have relatively more women on their boards of directors. Another interpretation is that firms which use relatively more human capital nominate more women as directors. While it is not the goal of this study to interpret this finding, it is interesting to register the fact that higher market valuation is associated with more women on boards, as has also been documented by Carter, Simkins and Simpson (2003). In contrast to Tobin's Q, ROA has a negative but statistically insignificant effect on diversity.

In its census, Catalyst (1999) documents that larger firms have a greater fraction of female directors. On average, women held 11.2% of the Fortune 500 board seats and only 8.5% of the Fortune 501-1000 board seats in 1998. Thus, we also include sales as a measure of firm size in column (II). As expected, the coefficient on sales is positive, but it is not significant.

The most striking finding in Table 2 is that, amongst all the variables considered here, firm risk is the most robust and important determinant of the proportion of women on boards.

8% female directors, which is roughly equal to the sample mean. Suppose risk in this firm is initially equal to its value at the 75th percentile of the empirical distribution and then jumps down to its value at the 25th percentile. The percentage of female directors will then increase by 32% (to a level of 10.5%). A drop from the 95th to the 25th percentile of the risk distribution is associated with an increase in the proportion of female directors of 70% of its initial value. When firm risk drops from its largest level to its lowest level, the original proportion of female directors more than triples.

4.1.1 Alternative Explanations, Causality and Robustness Checks

While the results in section 4.1 are consistent with our hypothesis, here we analyze whether they are also consistent with other explanations and perform various robustness checks.

One possible explanation for our finding is that the standard deviation of stock returns proxies for the complexity of tasks and boards are more likely to discriminate against women when tasks are complex because they trust their abilities less. To check if this explanation makes sense, we use the number of business segments as a different measure of complexity in column (III) of Table 2. In column (IV), we also include a different measure of variability, the standard deviation of the return on assets from 1992-1998. Neither of these measures of complexity significantly affects the proportion of women or the effect of firm risk on diversity. Another measure of complexity is firm age. We do not have data on firm age for the whole sample, but we do have the number of years since incorporation for the initial sample of 327 firms. In this restricted sample, firm age also does not significantly affect the proportion of women, and its inclusion does not affect the firm risk coefficient.[12]

While causality can never be inferred from probit regression results alone, the fact that the standard deviation of the return on assets has no significant effect on the fraction of women on boards in column (IV) of Table 2 suggests that our results are not driven by reverse causality. For example, one might argue that women are intrinsically more "stabilizing" than men, i.e. women take actions which reduce risk. If this were true, it is not clear why women should reduce stock return risk but not the riskiness of accounting measures.[13] The fact that the only volatility that matters is stock return volatility is, however, consistent with the hypothesis that diversity and incentive schemes are related. According to our hypothesis, the only volatility that matters is the one that affects compensation. Director compensation is not sensitive to ROA; therefore the volatility of ROA should not matter.

Another possibility is that self-selection is driving our result. There is a large body of literature which argues that gender may affect behavior. Most relevant for our paper, researchers have examined whether women are more risk-averse than men. If this were the case, one could argue that women are less willing to work for firms which offer highly risky compensation. This story is observationally equivalent to Kanter's conjecture. However, experimental evidence on differences in risk-aversion across the sexes is mixed. While Jianakoplos and Bernasek (1998) find evidence consistent with women being more risk-averse, Gneezy, Nierdele and Rustichini (2003) find no independent effect of

[12] The results of these regressions for the initial sample are similar to the ones for the expanded sample; therefore we do not report them here. The output of these regressions is available upon request.

[13] The results are similar if we use the variability of return on equity (ROE) instead of ROA. The output of these regressions is available upon request.

risk on behavioral differences between men and women. In addition, as we document in Section 4.2, the evidence on the relationship between compensation and diversity seems to contradict the "women-are-more-risk-averse" hypothesis, while being fully consistent with the idea that incentive pay and board homogeneity are substitutes. Firms with more performance-based compensation have more women on their boards, which is evidence against the self-selection story.[14] One might also argue that sectorial biases could lead to selection effects. For example, hi-tech firms may have both fewer female directors and higher volatility than other firms. Since we have included industry dummies in all our regressions, industry biases do not seem to be the main cause of the correlation between diversity and risk.

Finally, gender diversity on boards may have a political dimension. Firms may care more about diversity when they are concerned about their public image, either because they are large firms which are visible to outsiders or because they are required to deal with government agencies which have preferences for diversity. If firm risk is somehow correlated with this political demand for diversity, this argument could explain at least part of our findings.

Agrawal and Knoeber (2001) have investigated this possibility. Perhaps surprisingly, they find almost no support for the hypothesis that firms hire women as directors for political reasons. The only relevant determinant of gender diversity in their empirical analysis is firm size. In contrast, we find that firm size is not significant in regressions which include firm risk among the explanatory variables for board diversity. Similarly, firm size is not always a significant determinant of the number of female directors added to the board in Farrell and Hersch (2004), while firm risk is. It is therefore possible that part of Agrawal and Knoeber's (2001) finding, relating diversity and firm size, can be explained by the negative correlation between size and risk, since firm risk is not included in their regressions.

Overall we conclude that the results in Section 4.1 are robust to the inclusion of controls that alternative explanations might suggest. Furthermore, the magnitude of the effect of firm risk on the gender composition of boards is similar across all specifications in Table 2. The estimated slope on firm risk is approximately -0.47 with consistently high z-statistics.

[14] We do not claim to provide evidence that women are not more risk-averse than men. Rather, while it may be the case that women are on average more risk-averse than men, this does not imply that they will be more risk-averse than men *conditional on being corporate directors*. Thus, we cannot interpret our findings as evidence against the hypothesis that women are more risk-averse than men on average.

4.2 Incentive Pay and Diversity

In this section we examine the relationship between incentive pay and diversity. Although the evidence so far shows that diversity decreases with risk, according to our hypothesis we cannot conclude that group homogeneity and incentive pay are substitutes unless we also find that incentive pay increases with diversity (keeping risk constant).

We document a positive relationship between incentive pay and diversity. We conclude that our evidence is consistent with our hypothesis that more diverse boards require additional mechanisms to induce cooperation. The evidence is not consistent with the alternative hypothesis we discussed above that women are more risk-averse than men.

We divide compensation into three main groups: (the value of) shares, (the value of) options and salary. We define a director's salary to be the sum of the annual retainer plus board meeting fees multiplied by the number of board meetings. We make the standard assumption that shares and options provide directors with more performance-based incentives than salaries. The comparison between shares and options is more difficult. Clearly, which one of these components is more sensitive to performance will depend on the specific restrictions they come with. It also depends on how one defines "pay-performance sensitivity." Hall and Murphy (2002) show that if one defines pay-performance sensitivity as the derivative of the value of an option with respect to the price of the underlying stock, then the pay-performance sensitivity is maximized when the option is deeply in-the-money, that is, when the option is actually restricted stock (which are options with a strike price of zero). It seems reasonable then to assume that one dollar in restricted stock is more sensitive to firm performance than one dollar in options. In addition, while the sensitivity of options to the price of the underlying stock is measured by the *hedge ratio*, or *delta,* for diversified investors, Hall and Murphy (2002) show in simulations that this sensitivity may be much lower than the one implied by the delta when executives hold undiversified portfolios. Therefore, we do not attempt to measure pay-performance sensitivity of options by using deltas. Instead, we make the assumption that a compensation package that includes more restricted stock than options (in relative terms) will provide more pay-performance incentives to directors.

Table 3 shows the output of regressions of the ratio of the value of restricted shares to total compensation on diversity and other controls. We see in column (I) that the proportion of women is positively related to the fraction of shares in total compensation. Furthermore, this relationship is both statistically and economically significant. For example, an increase by one standard deviation in the proportion of women increases the value of shares relative to total compensation by 4.6 $(0.074 \cdot 0.602)$

percentage points. Since the average proportion of restricted stock in total compensation is 14.1%, this is a non-negligible increase.

Columns (II) to (V) show the output of regressions that include further control variables. The magnitude of the coefficients on diversity is fairly similar across specifications, ranging from 0.374 to 0.453, and the coefficients are always significant at the 1% level. As expected, firm risk, as measured by stock return volatility, has a significant negative effect on the use of restricted shares in director compensation. Board size has a small positive effect on compensation through shares. Sales also have a positive effect on shares, but firm value and performance (Tobin's Q and ROA) are not significantly related to the ratio of shares to total compensation.

Table 4 shows analogous results for regressions with the ratio of the fixed part of compensation (salary) to total compensation as the dependent variable. After controlling for risk, the effect of diversity on salary is negative and significant at the 1% level. Although they have the opposite sign, the coefficient estimates on the proportion of women in Tables 3 and 4 are very similar in absolute value. This suggests that increases in the proportion of women lead to increases in the fraction of shares at the expense of the fixed part of compensation, leaving the fraction of options in compensation more or less the same. In fact, in a SUR estimation of the equations in Tables 3 and 4, we could not reject the cross-equation restrictions of equality of coefficients on diversity (with opposite signs). In analogous regressions with the fraction of options in total compensation as the dependent variable, the estimated diversity coefficients were never significantly different from zero.[15]

In Table 5, we check the effects of diversity on the levels of each component of compensation, rather than on the proportions. We cannot reject that boards with relatively more women grant more shares to their directors. The coefficient on diversity is positive and significant at less than the 1% level. The value of options, salaries and total compensation are not conclusively associated with diversity.

Finally, the OLS estimates in Tables 3 and 4 do not incorporate the information that the compensation fractions are restricted to lie between 0 and 1. To impose that restriction, we estimate the following model:

$$y = \Phi\left(\boldsymbol{\beta}'\mathbf{X}\right) + \varepsilon \quad (2)$$

where y is the respective compensation fraction (shares, salary or options), $\mathbf{X}$ is a vector containing the proportion of women and other firm characteristics, $\boldsymbol{\beta}$ is a vector of coefficients, and Φ is the standardized normal cumulative distribution function. This is a non-linear regression which always

[15] We do not report these regressions here because the SUR estimates are the same as the estimates from equation-by-equation OLS. The effects on options/total compensation are implicitly estimated by 1-shares/total compensation - salary/total compensation. The output of these regressions is available upon request.

generates fitted values between 0 and 1. We estimated (2) by the non-linear least squares method.

Table 6 displays the results of reestimating the specifications in columns I and V of Tables 3 and 4 by non-linear least squares. Overall, the relationships between shares and diversity and between salary and diversity are robust to this non-linear specification. The coefficients on diversity have the same signs as in the OLS regressions and are all significant at less than the 1% level, except in column III, where the p-value is 0.052. In square brackets beneath the t-statistics, we report the marginal effects of diversity on shares and salary (the "slopes") calculated at the means of the data. These effects are roughly similar to the effects of diversity on the compensation fractions in the OLS specifications. In the non-linear-least squares regressions, the marginal effects of diversity on the fraction of shares in total compensation are 0.450 and 0.296. In the corresponding OLS specifications, the effects of diversity are 0.602 and 0.374. The marginal effects of diversity on the fraction of salary in total compensation in Table 8 are -0.271 and -0.459. In the corresponding OLS specifications the effects of diversity are -0.264 and -0.385.

In summary, in firms with more female directors, restricted shares comprise a greater part of director compensation, the fixed salary is relatively less important, and options are approximately equally important as in firms with fewer female directors. This is consistent with the hypothesis that more diverse firms provide more pay-performance incentives to their directors, and board homogeneity and formal incentive schemes are substitutes.

5 Board Meetings and Diversity

In previous sections we have argued that changes in the gender composition of the board may affect directors' incentives to work cooperatively. The fact that diversity and formal incentive schemes are related suggests that this effect is strong enough for firms to adjust their formal incentive schemes. It is thus natural to expect that diversity should also affect how boards carry out their work. Building upon arguments put forth by Blau (1977) and others, Eisenhardt, Kahwajy and Bourgeois (1997) argue that a benefit of diverse top management teams is that team members are able to provide different perspectives on important issues, which may reduce the probability of complacency in decision-making. However, since team members with different opinions are likely to disagree more, they also stress the importance of increasing the number of interactions between team members. Unless they learn to understand the viewpoints of dissenting members, teams members cannot work cooperatively. To overcome increased conflict between directors, Goodstein, Gautam and Boeker (1994) also argue that more diverse boards may require more time to make decisions. Directors interact primarily in board meetings, which is also where all decisions are made. On the basis of the previous arguments, we should expect to see that firms with a greater proportion of women on the board have more board meetings.

To examine this issue we regressed the number of board meetings in 1998 on the gender composition of the board. Since meetings are count data, we used Poisson regressions. The conditional mean of board meetings is assumed to be:

$$E\left[meet \mid \mathbf{X}\right] = \exp\left(\boldsymbol{\beta}'\mathbf{X}\right) \tag{3}$$

where $\mathbf{X}$ is a vector of firm characteristics containing the proportion of female directors on the board and other controls, and $\boldsymbol{\beta}$ is a vector of coefficients.[16]

Table 7 displays the results. From column I we can see that firms with relatively more women on their boards have more meetings. This result is statistically significant, but its economic significance is small. For example, at the means of the data, one would need to increase the proportion of women by six standard deviations to obtain one extra meeting. Given that the average number of meetings is 7.2, one extra meeting is not negligible. However, an increase in six times the standard deviation of the proportion of women is a rare event.

In columns II to V we include additional control variables. As in Vafeas (1999), we find a negative relationship between Tobin's Q and the number of meetings, and a positive relationship between board size and the number of meetings. However, these relationships are not very strong in our data, since the coefficient on Tobin's Q is not significant. We find firm risk (the standard deviation of stock returns) to be positively related to board meetings, which is compatible with Vafeas' findings that lagged returns are negatively related to the number of meetings. He does not examine the correlation between sales and meetings, which is positive and highly significant in our regressions. Most importantly, the statistical significance of the coefficient on the proportion of women is not affected much by the inclusion of these additional controls. The estimated coefficient on the proportion of women is always significant at greater than the 10% level, except in column IV where the p-value is 0.108. However, the economic significance also does not increase after including the additional control variables.

Overall, the estimated magnitude of the effects of gender diversity on board meetings is small, at least at the means of the data. However, one should keep in mind that the marginal effects of gender diversity on the number of meetings is not the same at all points of the empirical distribution. Thus, even though they appear small, we believe these results are still suggestive that diversity may impact the ways in which directors carry out their work. It is possible that we do not find large effects of

[16] The estimation method is maximum likelihood.

diversity on board meetings because directors of S&P companies, the firms covered by ExecuComp, are generally top executives of other firms and thus come from similar work environments. These directors may share board memberships in other firms or charitable organizations, and they may be members of the same business associations. Thus, they will also have the opportunity to interact outside of the boardroom. As a result, we believe that while conflicts may arise more frequently in diverse boards of S&P firms, it is reasonable to expect that directors of diverse boards should not require substantially more time to resolve them.

6 Benefits of Diversity

So far, we have provided evidence that changing the gender composition of the board may entail costs. Diverse boards may require additional incentives to work cooperatively and may require additional time to digest different viewpoints and resolve disagreements. But as we have described above, there are many arguments why changing the gender composition of the board can be beneficial. Women can add value by bringing different perspectives, experiences, and opinions to the table. Others argue that women have higher expectations regarding their responsibilities as directors, which can lead the board to become more effective (Fondas and Sassalos, 2000). While it is difficult to provide direct evidence consistent with the former argument, we can use our data to shed some light on the latter argument. The Securities Exchange Act of 1934 requires corporations to list in their proxy statements the name of each incumbent director who during the previous fiscal year attended fewer than 75 percent of the aggregate of the total number of meetings of the board and the total number of meetings held by all board committees on which he served while a director. Thus, we can use this information to examine whether female directors have fewer attendance problems than male directors. If so, boards with more women should have better overall attendance at meetings, which may make them more effective.

We use our initial sample of 327 firms for which we collected detailed director-level data from proxy statements. For each director in our sample, this data contains information on whether he or she was named in the proxy as having attendance problems.[17] From the proxies, we also obtained data on the number of other directorships of each director, the director's tenure as director, age, and retirement status. We exclude directors, such as executive or inside directors, from our sample who were not explicitly paid director compensation for their board service. Because directors are often appointed in the middle of the proxy year, we further restrict our sample to directors who were appointed to the

[17] Although the SEC has a 75% threshold, the way in which attendance problems are reported across firms varies. Some firms may have a different threshold or they may report only attendance problems for board meetings. Regardless of the threshold (even if it is greater than 75%), we assume that if a firm reports the name of a director in the proxy, from the point of view of the firm, that director has an attendance problem.

board prior to 1998. This ensures that we consider only directors who are not artificially constrained from attending board meetings in our regressions. Our final sample consists of detailed director-level data for 2610 directors.

In 74 (22.6%) of these firms, directors had attendance problems. However, directors generally had good attendance records. Only 3.2% of directors were named as having attendance problems. Female directors generally had better attendance records than male directors. 3.4% of male directors had attendance problems as opposed to 2% of female directors. Of the 84 directors with attendance problems, only 7 (8.3%) were female.

To examine the relationship between directors' gender and attendance, we estimate probit regressions in which the dependent variable is a dummy variable that is equal to one if the proxy reports that the director had attendance problems and is zero otherwise. Our main explanatory variable is a dummy which is equal to one if the director is female. In order to correctly interpret the results, one should keep in mind that the attendance problem dummy indicates those directors who experienced considerable attendance problems, i.e. they generally missed more than 25% of the meetings they were supposed to attend. Only when directors reach this threshold are firms required to disclose their names in the following year's proxy. Clearly, reputational concerns will cause directors to avoid crossing the threshold. As a consequence, it is not surprising that the proportion of directors reported as having substantial attendance problems is small: 3.2%. However, this does not mean that directors never skip meetings. Nevertheless, even using our more conservative measure of extreme attendance problems, as we show below, the effects of gender on attendance are statistically and economically significant. If we had actual attendance data for the entire sample we might find even stronger effects of gender on attendance at individual meetings.

We include three sets of controls in the probits in Table 8.[18] The first set, which we use in column I, consists of director characteristics, which may affect a director's attendance, such as the number of other directorships, director tenure, the director's age, and whether the director has retired from his/her main occupation. Because of reputational concerns, directors may care more about attending meetings in bigger, more well-known firms. Their incentives for attendance might also increase in more unpredictable and complex environments because board decisions may be more important. Thus, we include firm level controls such as sales as a proxy for firm size, and stock return volatility to proxy for uncertainty and complexity in column II. Because a director's attendance will plausibly be affected by board characteristics, we also include the board meeting fee, the total compensation a director receives,

[18] Because several industry dummies predict the outcome perfectly, the final number of observations in our probits is 2186, instead of 2610.

the number of board meetings, and board size in column III. In all specifications, we include industry dummies and adjust our standard errors for potential heteroskedasticity and group correlation within firms.

The coefficients on the control variables generally have the signs one might expect. Consistent with the idea that the number of directorships raises a director's opportunity cost of time, the coefficient on the number of other directorships is positive and statistically significant across all three columns. Similarly, retired directors are significantly less likely to have attendance problems. As in Adams and Ferreira (2004), the board meeting fee and total compensation are negatively and significantly related to the probability that a director has attendance problems. Most importantly, the coefficient on the female dummy is negative and statistically significant, albeit only at the 10% level, across all three columns. In square brackets beneath the z-statistics on the female dummy, we report the marginal effect of a discrete change in the female dummy from zero to one on the probability that a director experiences attendance problems. These marginal effects indicate that if a director is female, the probability that she experiences attendance problems is 0.02 lower than if the director is male. Given that the fraction of directors with attendance problems in the entire sample is 0.032, this amounts to a reduction in attendance problems of roughly 62.5% if the director is female. Although the female dummy is not highly statistically significant, our result is consistent with Adams and Ferreira (2004), who report that female directors have significantly lower attendance problems than male directors in a sample of bank holding company directors. Overall, our results suggest quite strongly that in boards with relatively more women, more directors participate in decision-making, which may enhance their effectiveness.

7 Final Remarks

The gender diversity of the board is a central theme of many recent governance codes (see e.g. Higgs, 2003, and Tyson, 2003). If companies don't voluntarily see to it that 25% of their directors are female, Sweden has threatened to also make diversity a legal requirement (see the discussion in *Corporate Board Member Europe* by Medland, 2004). Norway is asking its corporations to abide by a 40% gender quota. However, the consequences of changing the gender diversity of the board are, as yet, little understood. In this paper, we provide some new evidence that the gender composition of the board is related to the variability of stock returns, director compensation, and board meetings in a sample that predates the recent governance reforms. We propose an explanation for these correlations: the data are consistent with the hypothesis that changes in the gender composition of corporate boards may affect directors' incentives to work cooperatively. More diverse boards may require additional mechanisms to induce cooperation such as performance pay and additional board meetings. When performance-related pay for directors is costly, for example, when firm risk is high, firms will choose to have a less diverse board of directors.

Our findings suggest that increasing the gender diversity of the board may be costly for some firms. For those firms, enforcing gender quotas in the boardroom may ultimately decrease shareholder value. On the other hand, we also show that female directors have fewer attendance problems at board meetings. Thus, increasing gender diversity may benefit firms in which performance-related pay is less costly. Regardless of the firm, our results suggest that boards which increase the number of female directors may experience a transition phase in which directors must develop mechanisms to work cooperatively.

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Table 1: Summary Statistics

The sample consists of data on 1024 firms. All values are for fiscal year 1998. See text for details on sample selection. Sources are proxy statements, Compustat, CRSP, ExecuComp and the Directory of Corporate Affiliates (1999). Proportion of Women is the fraction of female directors on boards. Firm Risk is the standard deviation of monthly stock returns from 1993 to 1998. Tobin's Q is the ratio of the firm's market value to its book value. The firm's market value is calculated as book value of assets minus the book value of equity plus the market value of equity. ROA is the ratio of net income before extraordinary items and discontinued operations to its book value of assets. Sales are in thousands of dollars. The standard deviation of ROA is calculated using annual values from 1992 to 1998. All compensation variables are measured in thousands of dollars. Value of Shares is the market value of shares granted to directors using the stock price of the end of the same month of the firm's annual meeting. Value of Stock Options is the Black-Scholes value of options granted to directors assuming continuously-paid dividends. Estimates of firm volatility, dividend-yield and the risk-free rate are from ExecuComp. Strike prices are assumed to be equal to current prices and expiration is in seven years. Salary is the sum of the annual retainer plus meeting fees times the number of meetings. Total Compensation is the sum of the value of shares, options and salary.

Variable	Mean	Std. Dev.	Min	Max
Proportion of Women	0.079	0.074	0	0.414
Firm Risk (sd.deviation of Stock Returns)	0.100	0.042	0.038	0.435
Tobin's Q	2.027	1.581	0.589	19.151
ROA (return on assets)	4.131	11.043	-162.531	49.849
Sales	4642.693	10801.87	14.767	158514
Std. dev. of ROA	4.203	5.744	0.031	74.833
Number of Segments	4.375	2.827	1	18
Value of Shares	10.405	21.905	0	230.625
Value of Stock Options	40.983	88.156	0	789.704
Salary	27.736	12.838	0	87
Total Compensation	79.125	89.105	1	799.704
Shares/Total Compensation	0.141	0.225	0	1
Options/Total Compensation	0.306	0.327	0	1
Salary/Total Compensation	0.551	0.311	0	1
Board Size	10.014	3.174	2	45
Number of Board Meetings	7.167	2.842	1	20

Table 2: Probit Estimates of the Effects of Firm Risk on Gender Diversity

Values are for fiscal year 1998. The sample is composed of data from 1024 publicly traded firms for which no variable was missing. See text for details on sample selection. The estimation uses 6648 observations on individual directors for whom gender could be inferred. The dependent variable is 1 if the director is a woman and 0 if the director is a man. The method of estimation is maximum likelihood. A robust variance-covariance matrix is used, allowing for heteroskedasticity and correlation among directors from the same firm. *Z*–statistics are provided in parentheses. The reported "slope" (in square brackets) is the marginal increase in the predicted probability that a given director is a woman due to an infinitesimal increase in the respective independent variable. Slopes are calculated at the means of the data. All regressions include 2-digit industry dummies. Slopes are multiplied by 100 for Board Size, Tobin's Q and Number of Segments, by 1,000 for ROA and its standard deviation, and by 100,000 for Sales. The reported *z*-statistics are corrected for heteroskedasticity and group correlation within firms. The effect of the constant term is omitted. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Female Dummy			
Independent Variables	(I)	(II)	(III)	(IV)
Firm Risk	-3.667***	-3.656***	-3.491***	-3.893***
	(-5.23)	(-4.80)	(-4.61)	(-4.75)
	[-0.47]	[-0.47]	[-0.45]	[-0.50]
Board Size		0.008	0.008	0.008
		(1.02)	(1.04)	(1.05)
		[0.10]	[0.10]	[0.10]
Tobin's Q		0.034**	0.037**	0.025
		(2.35)	(2.56)	(1.52)
		[0.44]	[0.47]	[0.32]
ROA		-0.002	-0.002	-0.001
		(-0.91)	(-0.86)	(-0.25)
		[-0.20]	[-0.20]	[-0.07]
Sales		3.740E-06	2.700E-06	2.870E-06
		(1.56)	(1.10)	(1.17)
		[0.48]	[0.34]	[0.37]
Number of Segments			0.012	0.012
			(1.47)	(1.41)
			[0.15]	[0.15]
Sd. dev. of ROA				0.006
				(1.59)
				[0.76]

Table 3: OLS Regressions of Shares/Total Compensation on Gender Diversity and Other Controls

Values are for fiscal year 1998. The sample is composed of data from 1024 publicly traded firms. See text for details on sample selection. All regressions include 2-digit industry dummies. The dependent variable is the value of shares as a proportion of total compensation. *T*–statistics are provided in parentheses. The reported *t*-statistics are corrected for heteroskedasticity. The effect of the constant term is omitted. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Value of Shares/Total Compensation				
Independent variables	(I)	(II)	(III)	(IV)	(V)
Proportion of Women	0.602***	0.453***	0.406***	0.371***	0.374***
	(5.92)	(4.56)	(4.08)	(3.69)	(3.70)
Firm Risk		-1.293***	-1.085***	-1.057***	-1.128***
		(-7.31)	(-5.96)	(-5.88)	(-5.77)
Board Size			0.008***	0.006**	0.005**
			(2.83)	(2.08)	(2.03)
Sales				2.350E-06***	2.350E-06***
				(2.85)	(2.81)
Tobin's Q					-0.002
					(-0.37)
ROA					-0.001
					(-1.46)
R-squared	0.1188	0.1577	0.1659	0.1752	0.1773

Table 4: OLS Regressions of Salary/Total Compensation on Gender Diversity and Other Controls

Values are for fiscal year 1998. The sample is composed of data from 1024 publicly traded firms. See text for details on sample selection. All regressions include 2-digit industry dummies. The dependent variable is the salary as a proportion of total compensation. *T*–statistics are provided in parentheses. The reported *t*-statistics are corrected for heteroskedasticity. The effect of the constant term is omitted. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Salary/Total Compensation				
Independent variables	(I)	(II)	(III)	(IV)	(V)
Proportion of women	-0.264**	-0.463***	-0.474***	-0.425***	-0.385***
	(-1.98)	(-3.47)	(-3.50)	(-3.13)	(-2.84)
Firm Risk		-1.729***	-1.679***	-1.718***	-1.650***
		(-5.15)	(-4.75)	(-4.86)	(-4.47)
Board Size			0.002	0.005	0.005
			(0.52)	(1.36)	(1.43)
Sales				-3.260E-06***	-2.970E-06***
				(-3.64)	(-3.50)
Tobin's Q					-0.021***
					(-3.19)
ROA					4.403E-04
					(0.47)
R-squared	0.1036	0.1402	0.1405	0.1499	0.1584

Table 5: OLS Regressions of Directors' Compensation on Gender Diversity and Other Controls - Levels

Values are for fiscal year 1998. The sample is composed of data from 1024 publicly traded firms. See text for details on sample selection. All regressions include 2-digit industry dummies. *T*–statistics are provided in parentheses. The reported *t*-statistics are corrected for heteroskedasticity. The effect of the constant term is omitted. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variables			
Independent variables	Value of Shares	Value of Options	Salary	Total Compensation
Proportion of women	24.681***	-32.270	0.367	-7.222
	(2.76)	(-1.07)	(0.06)	(-0.23)
Firm Risk	-91.553***	596.353***	-49.001***	455.800***
	(-4.84)	(4.37)	(-3.81)	(3.53)
Board Size	0.629**	-1.113	0.760***	0.276
	(2.13)	(-1.16)	(4.21)	(0.29)
Sales	2.916E-04***	4.958E-04**	2.215E-04***	0.001***
	(2.76)	(2.07)	(2.83)	(2.88)
Tobin’s Q	1.148	16.384***	0.518**	18.050***
	(1.22)	(4.55)	(2.02)	(5.34)
ROA	-0.093*	0.442*	-0.110***	0.238
	(-1.89)	(1.66)	(-2.97)	(0.87)
R-squared	0.1903	0.2715	0.2318	0.2560

Table 6: NLLS Regressions of Directors' Compensation on Diversity and Other Controls

Values are for fiscal year 1998. The sample is composed of data from 1024 publicly traded firms. See text for details on sample selection. The reported estimates are for the coefficients of the following model:

$$y = \Phi(\boldsymbol{\beta}' \mathbf{X}) + \varepsilon$$

where y is either the proportion of shares or the proportion of salary in total compensation, $\mathbf{X}$ is a vector of firm characteristics (always including the proportion of women), $\boldsymbol{\beta}$ is a vector of coefficients and Φ is the standardized normal cumulative distribution function. The method of estimation is non-linear least squares. The reported "slope" (in square brackets) is the marginal increase in the proportion of shares or salary in total compensation due to an infinitesimal increase in the respective independent variable. Slopes are calculated at the means of the data. Slopes for Board Size and Tobin's Q are multiplied by 10, slopes for ROA are multiplied by 100, and slopes for Sales are multiplied by 100,000. All regressions include 2-digit industry dummies. *T*–statistics are provided in parentheses. The reported *t*-statistics are corrected for heteroskedasticity. The effect of the constant term is omitted. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variables			
Independent Variables	Shares/Total Compensation		Salary/Total Compensation	
Proportion of Women	2.366*** (5.71) [0.45]	1.788*** (4.06) [0.30]	-0.685* (-1.94) [-0.27]	-1.160*** (-2.66) [-0.46]
Firm Risk		-10.721*** (-6.44) [-1.77]		-5.100*** (-4.8) [-2.02]
Board Size		0.019 (1.6) [0.03]		0.012 (0.89) [0.05]
Sales		5.08E-06** (2.31) [0.08]		-9.15E-06** (-2.51) [-0.40]
Tobin's Q		0.011 (0.47) [0.02]		-0.050** (-2.09) [-0.20]
ROA		-0.007** (-1.99) [-0.10]		0.001 (0.41) [0.06]

Table 7: Poisson Estimates of the Effects of Gender Diversity on the Number of Board Meetings

Values are for fiscal year 1998. The sample is composed of data from 1024 publicly traded firms. See text for details on sample selection. The expected mean is:

$$E[y \mid \mathbf{X}] = \exp\{\boldsymbol{\beta}' \mathbf{X}\}$$

where y is the number of board meetings, $\mathbf{X}$ is a vector of firm characteristics (always including the proportion of women) and $\boldsymbol{\beta}$ is a vector of coefficients. The method of estimation is maximum likelihood. A heteroskedascity-consistent variance-covariance matrix is used. The reported "slope" (in brackets) is the marginal increase in the predicted number of meetings due to an infinitesimal increase in the respective independent variable. Slopes are calculated at the means of the data. Slopes are multiplied by 1000 for Sales. All regressions include 2-digit industry dummies. *Z*–statistics are provided in parentheses. The reported z-statistics are corrected for heteroskedasticity. The effect of the constant term is omitted. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Number of Board Meetings				
Independent variables	(I)	(II)	(III)	(IV)	(V)
Proportion of Women	0.319*	0.402**	0.336*	0.284	0.312*
	(1.89)	(2.32)	(1.92)	(1.61)	(1.77)
	[2.26]	[2.85]	[2.38]	[2.01]	[2.21]
Firm Risk		0.700**	1.002***	1.039***	0.743**
		(2.14)	(2.94)	(3.05)	(2.11)
		[4.97]	[7.10]	[7.36]	[5.26]
Board Size			0.011***	0.008**	0.008*
			(2.91)	(1.99)	(1.94)
			[0.08]	[0.05]	[0.05]
Sales				3.300E-06***	3.330E-06***
				(3.25)	(3.25)
				[0.02]	[0.02]
Tobin's Q					-0.013
					(-1.50)
					[-0.09]
ROA					-0.004***
					(-2.65)
					[-0.02]

Table 8: Probit Estimates of the Effects of Gender on Attendance Behavior

Values are for fiscal year 1998. The sample consists of data on directors who were on the boards of the Fortune 500 firms (excluding financial firms and utilities) in our sample for whom no variable was missing. We excluded directors from our sample who were not paid director compensation for their board service as well as all directors appointed to the board in 1998. The final sample consists of data on 2610 directors from 327 firms. Attendance Problem Dummy is a dummy variable that is equal to one if the director was named in the proxy as having attendance problems. Retired Dummy is equal to 1 if the proxy indicated that the director retired from his primary occupation. Remaining sample characteristics are as in Table 1. All specifications include 2-digit SIC industry dummies. *Z*-statistics (in parentheses) are adjusted for potential heteroskedasticity and for group correlation within firms. Marginal effects are reported in square brackets. The slopes for # Other Directorships, # Board Meetings, Tobin's Q are multiplied by 10, those for Tenure, Age, Board Size, Director Compensation and ROA are multiplied by 100, and those for Sales by 100,000. The effect of the constant term is omitted. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: Attendance Problems Dummy		
Independent variables	(I)	(II)	(III)
Female Dummy	-0.275*	-0.296*	-0.294*
	(-1.72)	(-1.83)	(-1.81)
	[-0.02]	[-0.02]	[-0.02]
# Other Directorships	0.046**	0.051**	0.049**
	(2.35)	(2.52)	(2.43)
	[0.03]	[0.03]	[0.03]
Tenure as Director	-0.007	-0.005	-0.005
	(-0.71)	(-0.54)	(-0.52)
	[-0.10]	[-0.04]	[-0.03]
Director Age	-0.004	-0.006	-0.006
	(-0.52)	(-0.66)	(-0.70)
	[-0.03]	[-0.04]	[-0.04]
Retired dummy	-0.258*	-0.277*	-0.280*
	(-1.73)	(-1.90)	(-1.91)
	[-0.02]	[-0.02]	[-0.02]
Volatility		1.099**	1.222**
		(2.04)	(2.25)
		[0.07]	[0.08]
Board Size		0.007	0.005
		(0.32)	(0.23)
		[0.04]	[0.30]
# Board Meetings		-0.022	-0.021
		(-1.12)	(-1.04)
		[-0.02]	[-0.02]
Board Meeting Fee		-0.202***	-0.201***
		(-2.68)	(-2.71)
		[-0.01]	[-0.01]
Director Compensation		-0.002***	-0.002***
		(-3.09)	(-2.72)
		[-0.01]	[-0.01]
Sales			1.520E-06
			(0.81)
			[0.01]
Tobin's Q			-0.067
			(-1.37)
			[-0.04]
ROA			0.009
			(0.80)
			[0.05]

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