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When Bill Rolls Off: Continuity and Change on Corporate Boards

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Abstract

The number of women on public company boards has increased dramatically in recent years. We study where these women directors came from and how they were absorbed. In the past five years, women with board experience obtain significantly more board seats than their male colleagues. Women directors are also more likely to have no previous board experience than men, indicating movement on both the intensive and extensive margin. Adding a woman director is associated with a transitory increase in board size about a third of the time. This increase reverts the following year when an existing director rolls off.

The board of directors occupies a central role in corporate law. Its duties include hiring and supervising the executives that run the company, determining their compensation, setting high-level corporate strategy, navigating pivotal corporate transactions (such as takeovers, mergers, etc) and generally representing the interests of shareholders. It is well established that the number of women directors at public companies has increased substantially over time, and that larger companies tend to have more women directors than smaller ones.

We study the dynamics of this transition. Using data from BoardEx, we document three patterns. First, we find that, starting towards the end of the 2010s, women with board experience see a jump in their subsequent board positions relative to their male colleagues. This is consistent with the idea that many companies began to more aggressively seek out female candidates in that period. Women directors are also more likely to be "newcomers," i.e., to have no previous board experience. Hence, the increase in women directors is coming both through additional positions for existing women directors of public companies and through the addition of women from outside that pool.

The second pattern relates to board size. Average board size has remained reasonably stable over the last nine decades (Holderness et al., 1999, Graham et al., 2020), potentially reflecting both the stickiness of the company characteristics that systematically determine board size and the stability of company-specific idiosyncratic factors (Boone et al., 2007). Shareholders react positively (negatively) to large reductions (expansions) in board size (Yermack, 1996), suggesting that a larger board can be value destroying (Jenter et al., 2023). A company can add women to its

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board in two ways: by expanding the board, or by replacing existing male directors with women. While we find evidence of both, the increase in board size is transitory and disappears the following year.

The third pattern relates to the replacement of existing male directors with women. Replacement can occur either through natural attrition or by the removal of men who would otherwise have stayed on as directors. We find no evidence of a decline in the average tenure of departing male directors, suggesting that the former is the norm.

The second and third patterns highlight a tradeoff in board construction: a larger board may benefit from more diversity, but size may also come with costs. They also suggest that companies tend not to remove incumbent directors prematurely to make room for new candidates. Last, our results point to a second reason why efforts to change board composition are likely to be gradual: not only must companies identify new candidates, they may also need to wait for a seat to open up (or be on the verge of opening up) through retirement or the standard board refreshment process.

1. New Appointments

Conditional on experience, women receive more *new* independent director positions than men, but only in the past few years; prior to that, there was no difference between men and women. When seeking out new directors, many companies prefer candidates who already have board experience (Cziraki and Robertson, 2021). They might be particularly aggressive in recruiting women with board experience if they feel pressure to diversify their boards relatively quickly (Bakke et al., 2021, Kuzmina and Melentyeva, 2021, Maghin, 2022), as it is easy to identify directors of other public companies. This might explain the differences we observe between men and women. We focus attention on independent director positions because executive positions—which involve working as a top executive at the company—typically involve a more complex search and selection process.[1]

We proxy for experience using the size rank of the largest company on which the individual serves as a director (measured by equity market capitalization) in a given year.[2] We then measure the number of new independent director appointments the individual receives two years later. For example, suppose both Mary and Joe are on the board of XYZ Corp in 2015. We compare the number of new positions Mary obtains in 2017 to the number of new positions Joe obtains. Accordingly, the unit of observation is a director $\times$ year. We control for the number of current positions, director age (in 5-year bins) and for whether the individual is currently an executive of a public company, as that may affect the amount of time she has to take on additional roles. To study changes over time, we estimate this regression each year. Throughout our analysis, we use Bonferroni correction to account for multiple hypothesis testing. Figure 1 presents the results. With the exception of the first—representing women with experience at one of the 50 largest companies in the relevant year—each of the sub-figures shows a distinct upward trend towards the end of the sample period.[3]

The upward trend is consistent across the remaining three sub-figures. Prior to about 2018 (corresponding to experience obtained in 2016), there was no statistically significant difference between the future career prospects of men and women with experience outside the 50 largest companies.[4]

[1] We repeat our analysis using all director positions in Appendix Figure IA.1 and find estimates that point in the same direction but are about half as large.

[2] We discuss the empirical details of our analysis in Appendix IA.1.

[3] The wide confidence intervals in the first sub-figure may be due in part to the smaller coverage in the early years of the sample. There are about 500 observations in each of the regressions beginning in 2015.

[4] This does not necessarily mean that men and women were treated equally, as there may have been differences

Around 2018, this changed markedly.[5] The magnitudes of these differences are both meaningful and strikingly consistent. For example, women with experience at small-cap companies in 2020 obtained, on average, 0.19 additional board seats (or, alternatively, a 19% greater chance of an additional board seat) in 2022 compared to their male colleagues. The mean (median) number of board seats in 2022 in the regression sample is 2.21 (2), with a standard deviation of 1.12. The point estimates for women with experience at mid- and large-cap companies are similar: 0.21 and 0.22.[6]

The increase in future board positions for experienced women directors does not account for the entire increase in the number of women directors. Outside the very largest companies, we find that women directors are significantly more likely to be newcomers to the boardroom than their male colleagues. Figure 2 plots, for each year, the average percentage of men and women directors with no previous director experience at any of the companies in our sample. Outside the very largest companies, we find that the percentage of newcomers is substantially higher among women than men.[7] While this is not an entirely new phenomenon (in contrast to the results in Figure 1) it is particularly pronounced in the last few years, and particularly at smaller companies.[8]

Overall, both tests indicate that companies have considered a wider range of candidates when adding women—but not men—directors. These patterns are consistent with companies coming under intense pressure to add women to their boards in the past few years.

2. Board Size

Do companies increase board size to add women? On average, about a third of the increase in women is associated with an expansion in board size, but this increase is transitory. Figure 3 shows that board size has increased only modestly over the past few decades. While we see substantial evidence of board expansion over the course of the 1990s, particularly outside of the very largest companies, this expansion slowed over the past 15 years, shown by the dashed lines at 2007 and 2022. If anything, the boards of the very largest companies have become slightly smaller (from 13.20 directors to 12.86), although this different is not statistically significant. The small measured increase (from 8.36 to 8.46) at small-cap companies is also not statistically significant. Board size increased only modestly among large- and mid-cap companies: from 11.28 to 11.66 at the large-cap companies, and from 9.83 to 10.54 at mid-cap companies.[9]

Meanwhile, the number of women directors has crept up steadily since the 1990s. The trend has accelerated in recent years, particularly outside the very largest companies. This is a well known

in their treatment prior to obtaining that experience. Rather, it means that, *given* their current experience, the subsequent outcomes are not distinguishable on average.

[5]Consistent with this phenomenon, in Appendix Section IA.2, we also document a modest shift to the right in the distribution of board seats concurrently held by woman directors relative to their male colleagues over time. This shift is most pronounced among women with experience at large- and mid-cap companies.

[6]The mean (median) number of board seats in 2022 in each of these regression samples is 2.71 (2) and 3.13 (2), with a standard deviation of 1.53 and 1.77, respectively. While not statistically significant, the point estimate for women with experience at the largest companies is also consistent, at 0.21. This is relative to a mean (median) of 3.61 (3) and a standard deviation of 2.07.

[7]We also find that newly appointed women directors tend to be somewhat younger than their male colleagues—see Appendix Figure IA.2. However, this difference has actually narrowed in recent years.

[8]We also observe that while women were more likely to be newcomers than men in the late 2010s, this gap closed at large- and mid-cap companies in 2020. This may be due to efforts to diversify boards along other dimensions—namely race—in the wake of the murder of George Floyd (e.g., Bogan et al. (2021)).

[9]These differences are statistically significant at conventional levels (p=0.039 and 0.000, respectively).

phenomenon (Kim and Starks, 2016, Deloitte, 2023), and is consistent with much prior literature on corporate governance (e.g. Adams and Ferreira (2009), Gokulan (2021)).

It is also clear that boards have not expanded enough over the past 15 years to account for the increase in the number of women directors. Over that period, mega-, large and mid-cap companies all added between 1.8 and 2 women directors, on average. The small-cap companies were only slightly behind, adding an average of 1.4 women directors.[10] Unsurprisingly, the average number of women directors increases monotonically with company size.

We study the relationship between the addition of women and board size more formally using an event study framework. The unit of observation is a company × year. We control for the number of women directors, and include company, year, and company size group fixed effects (where company size group is the same as in Figure 3), and cluster standard errors at the company level. We present the results in Figure 4. The dependent variable is the size of the board. In the figures in the top (bottom) row, t=0 refers to the year in which the number of women directors increased by one (two).[11] The figures in the left column show the results using all years beginning in 1990; those on the right use data beginning in 2010.

The results in the top row indicate that, on average, in the year in which a woman is added to a board, board size increases by about a third of a director. While the point estimate is slightly lower in the 2010-2022 subsample, the confidence intervals overlap comfortably. This increase, however, is transitory. Board size drops almost all the way back to its pre-addition level within one year. If anything, the drop is even sharper in the 2010-2022 subsample: one year after the addition of a woman director, boards are, on average, exactly the same size as they were before the addition.

Larger changes dissipate equally quickly: the bottom row of Figure 3 examines the addition of two women directors. The point estimates in year $t = 0$ are almost exactly double the ones in the first row, indicating that the transitory increase in board size "per woman director added" is virtually identical. As in the top row, this disappears by $t = 1$. While the point estimates are slightly negative from $t = 1$ through $t = 3$, they are both close to zero and not statistically significant.

All told, these results suggest that, on average, about one third of the time, the addition of a woman director is associated with an increase in board size by one director. This increase, however, tends to revert the following year. This is consistent with the idea that a company that identifies a suitable woman candidate might add her to the board quickly and then decline to replace a male director when he departs a year later.

3. Natural Attrition

On average, newly added women appear to be replacing men who are rolling off in the ordinary course rather than men who would otherwise remain on the board. Figure 5 presents the results of an event study analysis of the relationship between the addition of a woman director and the tenure of departing male directors. As in Figure 4, the unit of observation is a company × year and we include a control for the number of women directors and company, year, and size group fixed effects. The top row presents results where the "event" is an increase of one woman director; the bottom

[10] All of these increases in the number of women directors are statistically significant beyond the 0.1% level.

[11] We measure this as a net increase. For example, if, in year $t = 0$, one woman left the board and two women joined, the number of women directors increased by one.

row studies an increase of two women directors. The left column uses data beginning in 1990, while the right begins in 2010. Across all four sub-figures, we find no statistically significant relationship between the addition of women directors and the tenure of departing male directors.[12]

4. Discussion

Our analyses provide suggestive evidence about the construction and evolution of corporate boards. The results in Part 1 shed light on the search for candidates, particularly when companies are under pressure. The patterns documented in Figure 1 indicate that, until recently, companies tended to treat men and women with board experience equally, at least given the observable characteristics that we can measure. The increase documented in Figure 1 suggests that, in recent years, companies have been recruiting women who would previously not have been selected.

The results in Part 2 are consistent with the idea that there is a tradeoff in board construction. While a larger board might have the benefit of more diversity (of both biography and expertise), it may also come with costs. In addition to the relatively modest pecuniary costs of paying more directors, larger boards may be more difficult to coordinate and boardroom discussions might become unwieldy. This also suggests that, contrary to the suggestion of some commentators, boards are unlikely to continue to expand indefinitely.[13] The results in Part 3 suggest that companies value their relationships with current directors, and are unlikely to seek to remove them prematurely to make room for new candidates. This is consistent with different models of corporate governance (Lipton and Lorsch, 1992, Jensen, 1993, John and Senbet, 1998, Raheja, 2005). The results also suggest a second reason why efforts to change board composition are likely to be gradual: not only must companies identify new candidates, they may also need to wait for a seat to open up (or be about to open up) through a retirement.

Combined, these results paint a fairly clear picture: while companies have been under pressure to add women to their board of directors, this has not led to large changes in board size. One in three companies adding one woman director saw a temporary increase in board size. Such inreases reverted the next year, as a male director rolled off in the ordinary course.[14]

[12] We repeat the analysis using tenure of all departing directors and find similar results. See Appendix Figure IA.7.

[13] For example, in a research note, Spierings (2022) argues that we should "[e]xpect boards to continue to increase in size as companies seek to increase diversity, add new skills and expertise, and populate new board committees providing ESG oversight. As companies are seeking to increase diversity on their boards, they cannot wait until a retirement creates an opening to add a new director because the attractive candidates may have other offers before then. Instead, they need to strike while the iron is hot, which means at least temporarily increasing the size of the board to allow for some overlap. That temporary increase, however, is likely to become permanent."

[14] We illustrate a consequence of this gradual transition in Appendix Section IA.3.

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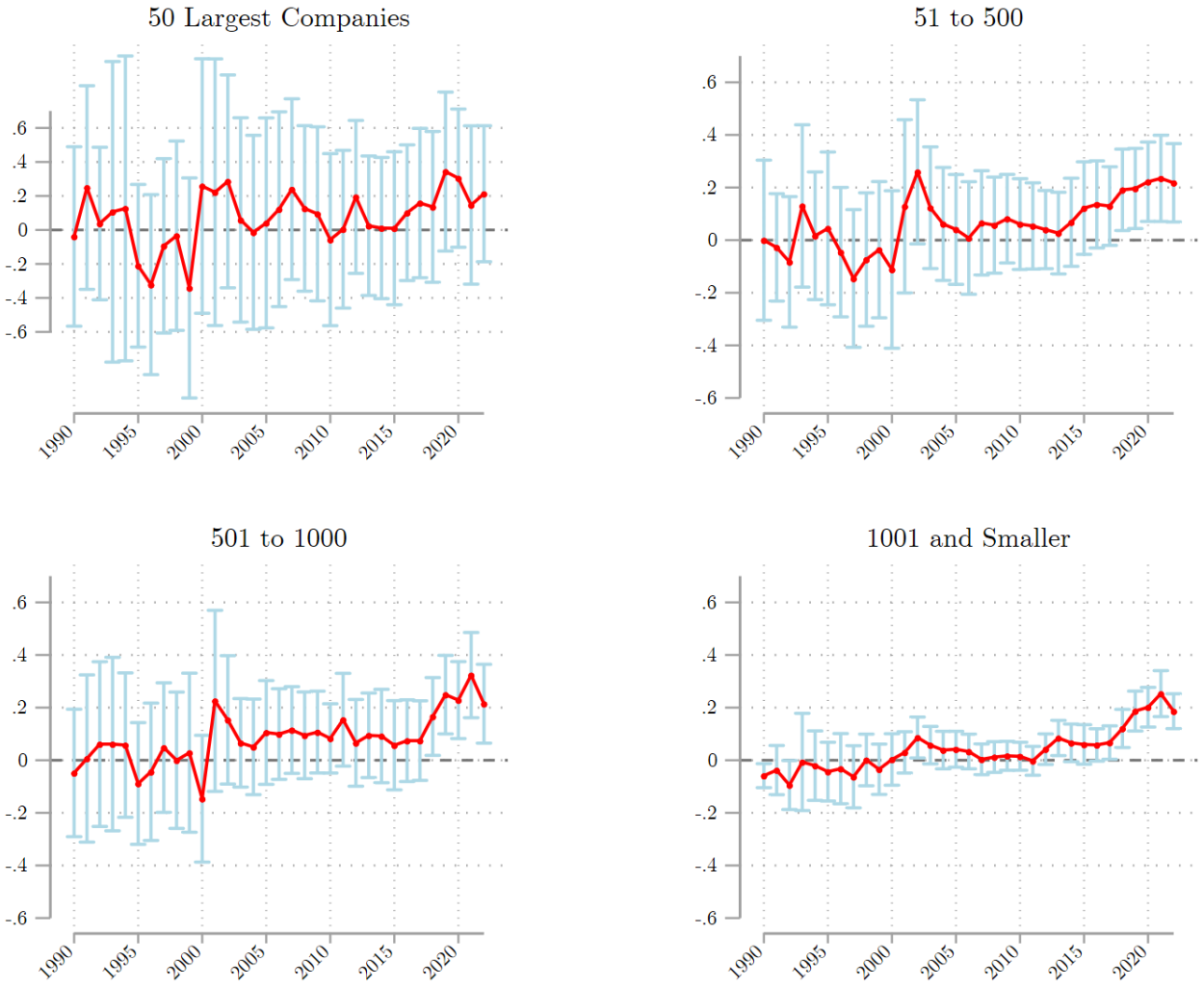
Figure 1: Relationship Between Independent Director Experience and Number of Positions 2 Years Later—Average Difference Between Women and Men

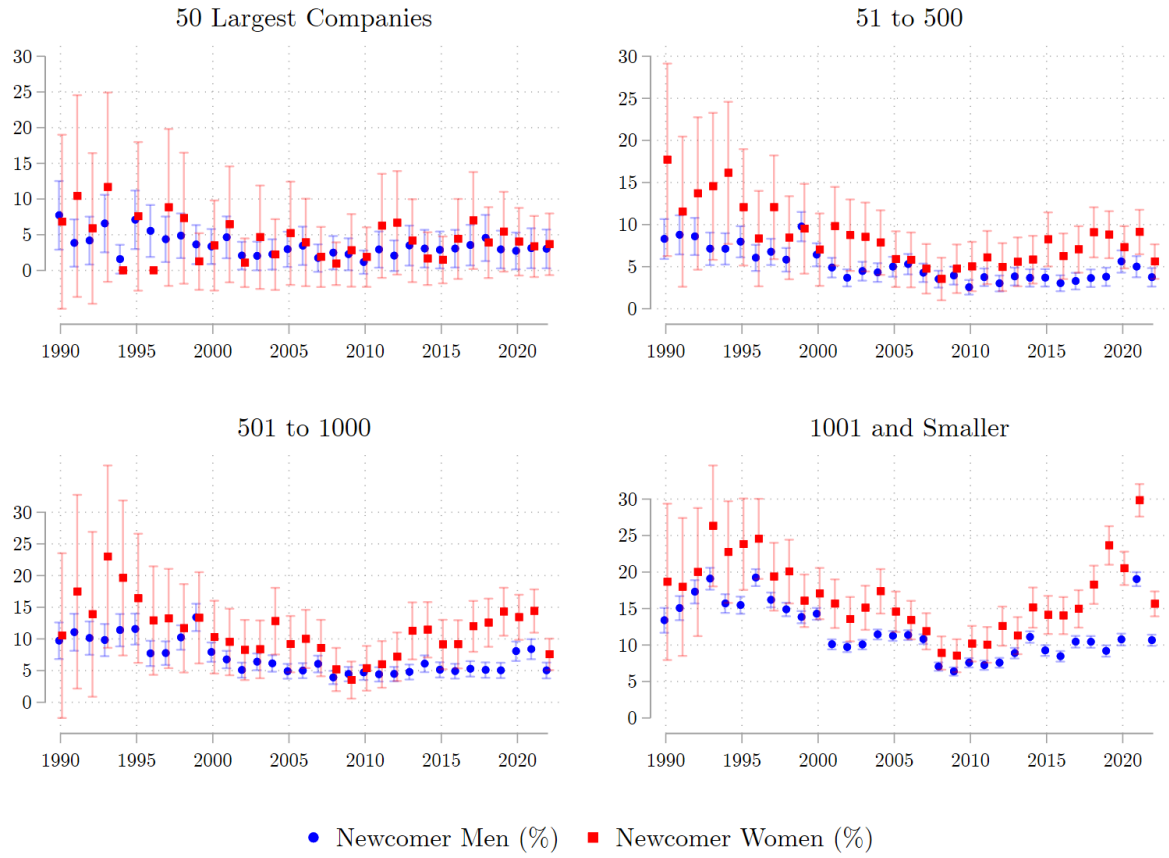


The vertical axis represents the point estimate on the female indicator variable from cross-sectional OLS regressions using data from the year indicated on the x-axis for individuals in the indicated size category (1 to 50, 51 to 500, 501 to 1000, and 1001+). A director is assigned to the size rank of the largest company she is a director of in year $t-2$, where size is measured by equity market capitalization. The unit of observation is the individual director in the indicated year. The regression model is, for each year t,

$$NumberPositions_{i,t} = \delta \times Female_i + NumberPositions_{i,t-2} + \Phi_{i,t-2} + \varepsilon_{i,t}$$

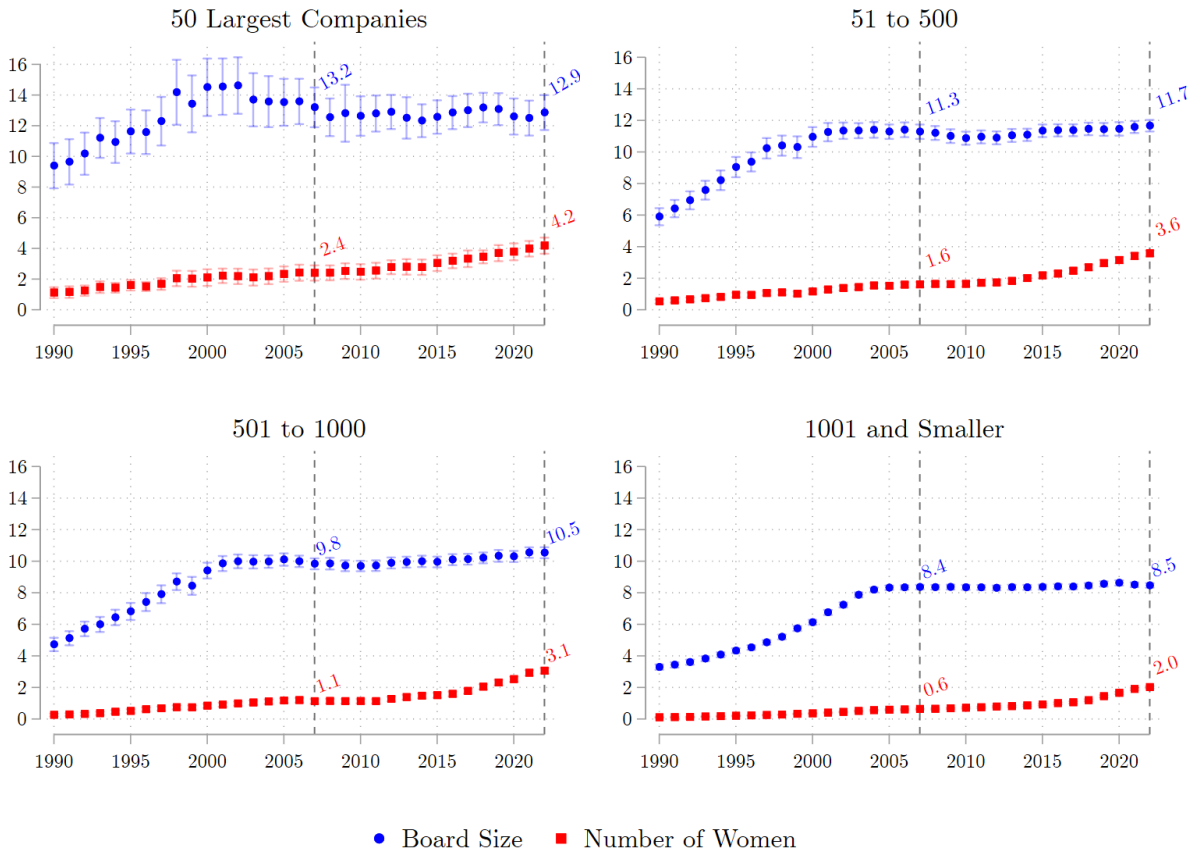
Where $NumberPositions_{i,t}$ is the number of independent director positions individual i has in year t, $Female_i$ is an indicator variable equal to one if individual i is female. The coefficient on this variable, δ, is what we plot. $\Phi_{i,t-2}$ is a vector of fixed effects for individual i in year $t-2$, and $\varepsilon_{i,t}$ is the error term. The fixed effects are individual i's age in year $t-2$ (in 5-year categories) and an indicator variable equal to one if the individual is an executive in year $t-2$ Error bars represent 95% confidence intervals around the point estimate, calculated using robust standard errors and a Bonferroni adjustment to account for the fact that we are displaying 33 different estimates (one for each year between 1990 and 2022).

Figure 2: Average Percentage of Directors with No Previous Board Experience, By Gender and Company Size



This figure plots the average percentage of men (indicated with blue circles) and women (indicated with red squares) directors with no previous board experience per year. Companies are divided into four groups by equity market capitalization in the year in question, where 1 is the largest company. Error bars represent 95% confidence intervals around the estimates, calculated using a Bonferroni adjustment to account for the fact that we are displaying 33 different estimates (one for each year between 1990 and 2022).

Figure 3: Average Board Size and Number of Women Directors, By Company Size



This figure plots the average board size (indicated with blue circles) and average number of women (indicated with red squares) per year. Companies are divided into four groups by equity market capitalization in the year in question, where 1 is the largest company. Error bars represent 95% confidence intervals around the estimates, calculated using a Bonferroni adjustment to account for the fact that we are displaying 33 different estimates (one for each year between 1990 and 2022). The means values for 2007 and 2022 are printed in the figure. The difference in board size between 2022 and 2007 is not statistically significant in the first figure (representing the largest companies, p=0.534). The difference is statistically significant in the second and third figures (p=0.039 and p=0.000, respectively), and is only very marginally significant in the fourth (representing the smallest companies, p=0.104). The difference in the number of women directors 2022 and 2007 is statistically significant in all four figures (p=0.000 in all four).

Figure 4: Change in Board Size after the Addition of Women Directors

This figure plots the results of an event study analysis of the relationship between an increase in women directors and board size. The unit of observation is a company × year. $t = 0$ represents the year that the number of women increased by one (two) in the top (bottom) row. The left column uses data from 1990 through 2022; the right column restricts the sample to 2010 through 2022. The regression model is

$$Size_{j,\tau} = \beta^{-2} \times T^{-2}_{j,\tau} + \beta^{0} \times T^{0}_{j,\tau} + \beta^{1} \times T^{1}_{j,\tau} + \beta^{2} \times T^{2}_{j,\tau} + \beta^{3} \times T^{3}_{j,\tau} + \delta \times N^{F}_{j,\tau} + \Phi_{j,\tau} + \varepsilon_{j,\tau}$$

Where $T^{k}_{j,\tau}$ is an indicator variable equal to one if year τ represents event time k for company j. The β^{k} estimates are what we plot in the figure. $size_{j,\tau}$ is the size of company j's board in year τ, $N^{F}_{j,\tau}$ is the number of women on company j's board in year τ, $\Phi_{j,\tau}$ is a vector of fixed effects for company j in year τ, and $\varepsilon_{j,\tau}$ is the error term. The fixed effects are company size category (which are the same as those in Figure 1), year, and company. Error bars represent 95% confidence intervals around the point estimate, calculated using standard errors clustered at the company level and a Bonferroni adjustment to account for the fact that we are displaying 5 different estimates.

Figure 5: Change in Tenure of Departing Male Directors after the Addition of Women Directors

This figure plots the results of an event study analysis of the relationship between an increase in women directors and tenure of departing male directors. The unit of observation is a company × year. $t = 0$ represents the year that the number of women increased by one (two) in the top (bottom) row. The left column uses data from 1990 through 2022; the right column restricts the sample to 2010 through 2022. The regression model is

$$Tenure^{M}_{j,\tau} = \beta^{-2} \times T^{-2}_{j,\tau} + \beta^{0} \times T^{0}_{j,\tau} + \beta^{1} \times T^{1}_{j,\tau} + \beta^{2} \times T^{2}_{j,\tau} + \beta^{3} \times T^{3}_{j,\tau} + \delta \times N^{F}_{j,\tau} + \Phi_{j,\tau} + \varepsilon_{j,\tau}$$

Where $T^{k}_{j,\tau}$ is an indicator variable equal to one if year τ represents event time k for company j. The β^{k} estimates are what we plot in the figure. $tenure^{M}_{j,\tau}$ is the average tenure of departing male directors of company j's board in year τ, $N^{F}_{j,\tau}$ is the number of women on company j's board in year τ, $\Phi_{j,\tau}$ is a vector of fixed effects for company j in year τ, and $\varepsilon_{j,\tau}$ is the error term. The fixed effects are company size category (which are the same as those in Figure 1), year, and company. Error bars represent 95% confidence intervals around the point estimate, calculated using standard errors clustered at the company level and a Bonferroni adjustment to account for the fact that we are displaying 5 different estimates.

Internet Appendix to

When Bill Rolls Off

Intended for Online Publication

IA.1. Empirical Details

IA.1.a. Data & Merging

We obtain information on directors from BoardEx. We identify men and women using the gender variable in BoardEx. We retain data for 1980-2022, but in most of the analysis we restrict attention to sub-periods. We restrict attention to companies coded "US"

Company size data come from CRSP. Our proxy for size is equity market capitalization, which we calculate by multiplying the number of shares outstanding on the last day of December of each yer by the price on that date.

We use the BoardEx-CRSP linking file in WRDS as a starting point. From there, we do a secondary merge using CUSIP. Finally, we use fuzzy matching (specifically, the Stata matchit package) to match the remaining companies (and manually inspect all matches with scores below 80%).

Popular names data come from the Social Security Administration.

IA.1.b. Variable Construction

We consider director i to have joined the board of company j in the year in which she is recorded in BoardEx as having started the role in question. We consider her to have left the board in the last year in which she is recorded as having the role in question.

We define the average age of new directors as the mean of the age of directors who join the board of company j in year t. We define the tenure of director i at company j as the difference between the year she ended her role and the year she started it. We define the average tenure of departing directors as the average tenure of directors who leave the board of company j in year t.

We define the size of the board of company j in year t as the total number of directors in that year. We define the number of women directors on the board of company j in year t as the total number of women directors in that year. We define the change in the number of women on the board between years $t-1$ and t as the difference between the total number of women on the board in year $t-1$ and the total number of women on the board in year t.

IA.1.c. Size Groups

IA.1.c.1. Individual Level

For individual director-level analyses (i.e., Figures 1 and 2 and Appendix Figures IA.1 and IA.3 to IA.6), an individual i's size group in year t is based on the size of the largest company that the individual served as a director of in year t. The groups are indicated in the titles to the sub-figures and in the caption to the figure. The size groups that we use are as follows:

- Largest group (mega-cap companies): Companies ranked 1 to 50 by size in year t (where 1 is the largest in year t)
- Second largest group (large-cap companies): Companies ranked 51 to 500 by size in year t (where 1 is the largest in year t)
- Third largest group (mid-cap companies): Companies ranked 501 to 1000 by size in year t (where 1 is the largest in year t)
- Smallest group (small-cap companies): Companies ranked 1001 and below in year t (where 1 is the largest in year t)

IA.1.c.2. Company Level

For company level-analyses (i.e., Figures 3 to 5, and Appendix Figures IA.2, IA.7, and IA.8), a company j's size group in year t is based on the size (i.e., equity market cap) of that company size in that year. We use the same size groups for these analyses as we do for the individual level analyses:

- Largest group (mega-cap companies): Companies ranked 1 to 50 by size in year t (where 1 is the largest in year t)
- Second largest group (large-cap companies): Companies ranked 51 to 500 by size in year t (where 1 is the largest in year t)
- Third largest group (mid-cap companies): Companies ranked 501 to 1000 by size in year t (where 1 is the largest in year t)
- Smallest group (small-cap companies): Companies ranked 1001 and below in year t (where 1 is the largest in year t)

IA.2. Number of Simultaneous Board Seats

Consistent with the results in Section 1, we find that the distribution of board seats per woman director has shifted to the right over time relative to men. This indicates that, conditional on being a director, women are now modestly more likely to hold a relatively large number of board seats than their male colleagues, and are less likely than their colleagues to hold just one board seat.

To see this, we present a series of histograms in Figures IA.3 through IA.6. No particularly strong pattern is apparent over time among the largest companies (presented in Figure IA.3). Splitting the sample in 2015, a Kolmogorov-Smirnov test for equality of distribution functions indicates that the distribution for men is more skewed to the left than the distribution for women in both the pre- and the post-2015 sub-sample (p=.023 and .000 for the one-sided tests, respectively).

This is not the case among the next largest group (presented in Figure IA.4). There, we see a distinct shift to the right in the distribution for women relative to men. While women (represented by the red bars) were more likely to hold 1 board seat then men (represented by the blue bars) in 1990 and 2000, this had reversed by 2020 and 2022. The pattern among the small- and mid-cap companies (presented in Figure IA.5) is similar. Kolmogorov-Smirnov tests confirm this change.[15] Again, we emphasize that these histograms are *conditional* on having at least one board seat in the year in question.

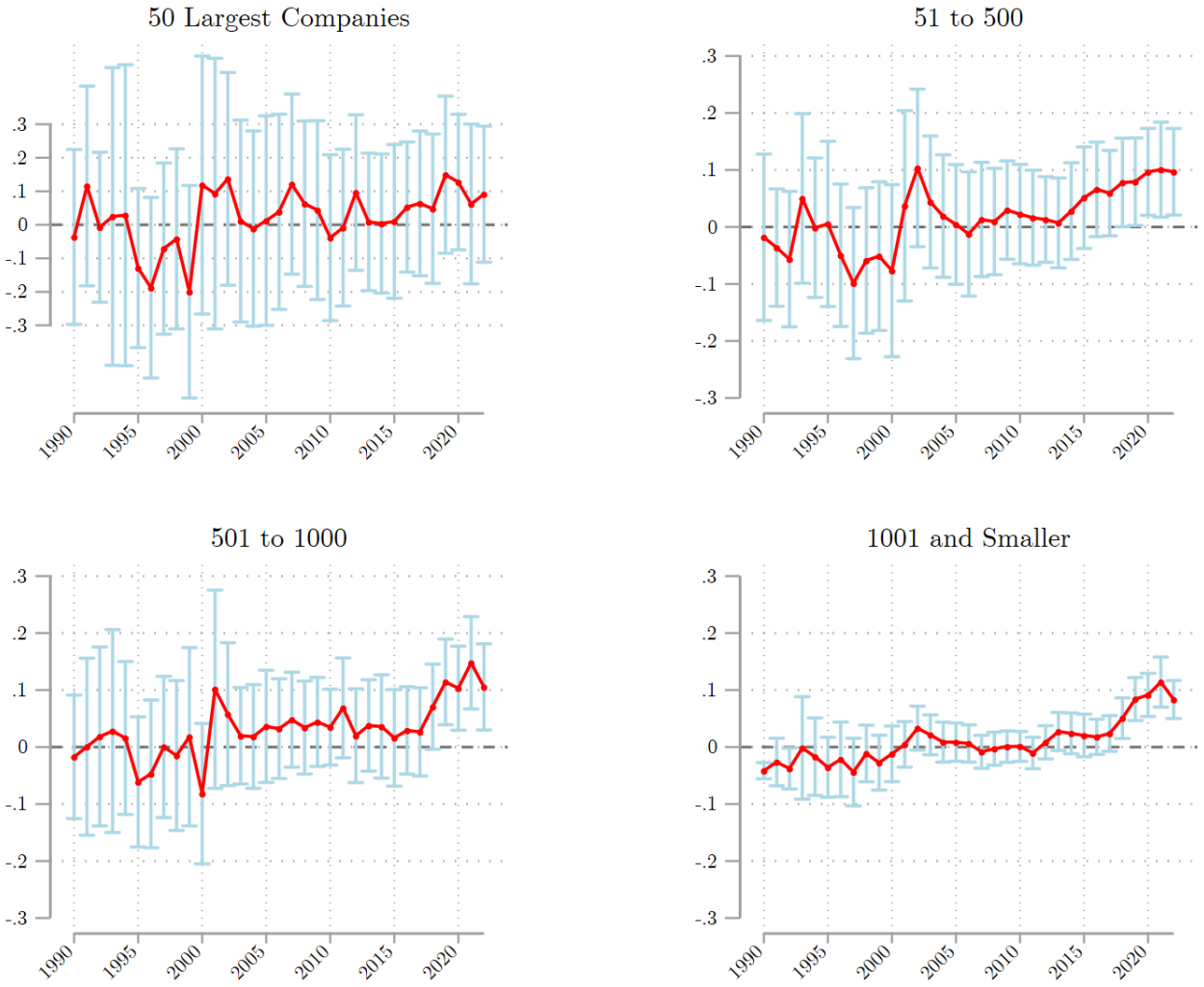
IA.3. Bills Rolling Off

Figure IA.8 illustrates a consequence of this gradual transition. In it, we plot the average number of directors with one of the 10 most popular male names in the United States over the past century using data from the Social Security Administration (2023). The names are James, Robert, John, Michael, David, William, Richard, Joseph, Thomas, and Christopher, as well as the following standard abbreviations of these names: Jim, Rob, Bob, Mike, Dave, Bill Will, Rich, Rick, Ricky, Dick, Joe, Tom, Thom, and Chris.. Across all four size groups, even during the first decade of the 2000s, directors with one of these 10 names outnumbered women, on average. For the largest companies, this began to change around 2012 or so (when the two groups became roughly the same size) but it was not until 2020 that women decisively overtook men with these names. For smaller companies, this happened even later. Eventually, however, as Jims, Mikes, and Daves have rolled off, they've been replaced by Jens, Lizs, and Barbs.

[15] For the large-cap companies, the distribution for women is more skewed to the left than the distribution for men in the pre-2015 period (p=.010). After that, it is more skewed to the right (p=.000). The same is true for mid-cap companies (p-values of .007 and .000) and small-cap companies (p-values of .000).

IA.4. Supplementary Figures

Figure IA.1: Relationship Between Board Experience and Number of Positions 2 Years Later
Average Difference Between Women and Men

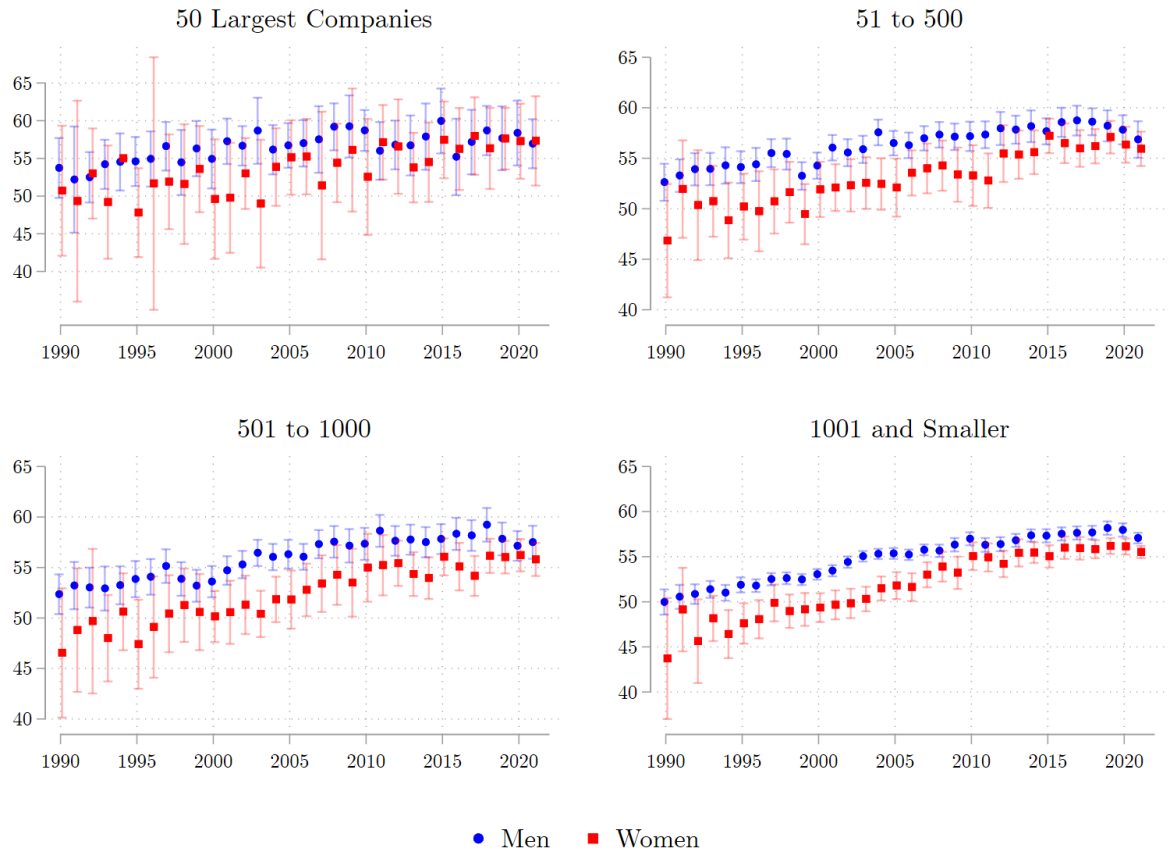


The vertical axis represents the point estimate on the female indicator variable from cross-sectional OLS regressions using data from the year indicated on the x-axis for individuals in the indicated size category (1 to 50, 51 to 500, 501 to 1000, and 1001+). A director is assigned to the size rank of the largest company she is a director of in year $t-2$, where size is measured by equity market capitalization. The unit of observation is the individual director in the indicated year. The regression model is, for each year t,

$$NumberPositions_{i,t} = \delta \times Female_i + NumberPositions_{i,t-2} + \Phi_{i,t-2} + \varepsilon_{i,t}$$

Where $NumberPositions_{i,t}$ is the total number of board positions (including both independent and executive directorships) individual i has in year t, $Female_i$ is an indicator variable equal to one if individual i is female. The coefficient on this variable, δ, is what we plot. $\Phi_{i,t-2}$ is a vector of fixed effects for individual i in year $t-2$, and $\varepsilon_{i,t}$ is the error term. The fixed effects are individual i's age in year $t-2$ (in 5-year categories) and an indicator variable equal to one if the individual is an executive in year $t-2$. Error bars represent 95% confidence intervals around the point estimate, calculated using robust standard errors and a Bonferroni adjustment to account for the fact that we are displaying 33 different estimates (one for each year between 1990 and 2022).

Figure IA.2: Average Age of New Directors, By Company Size and Gender

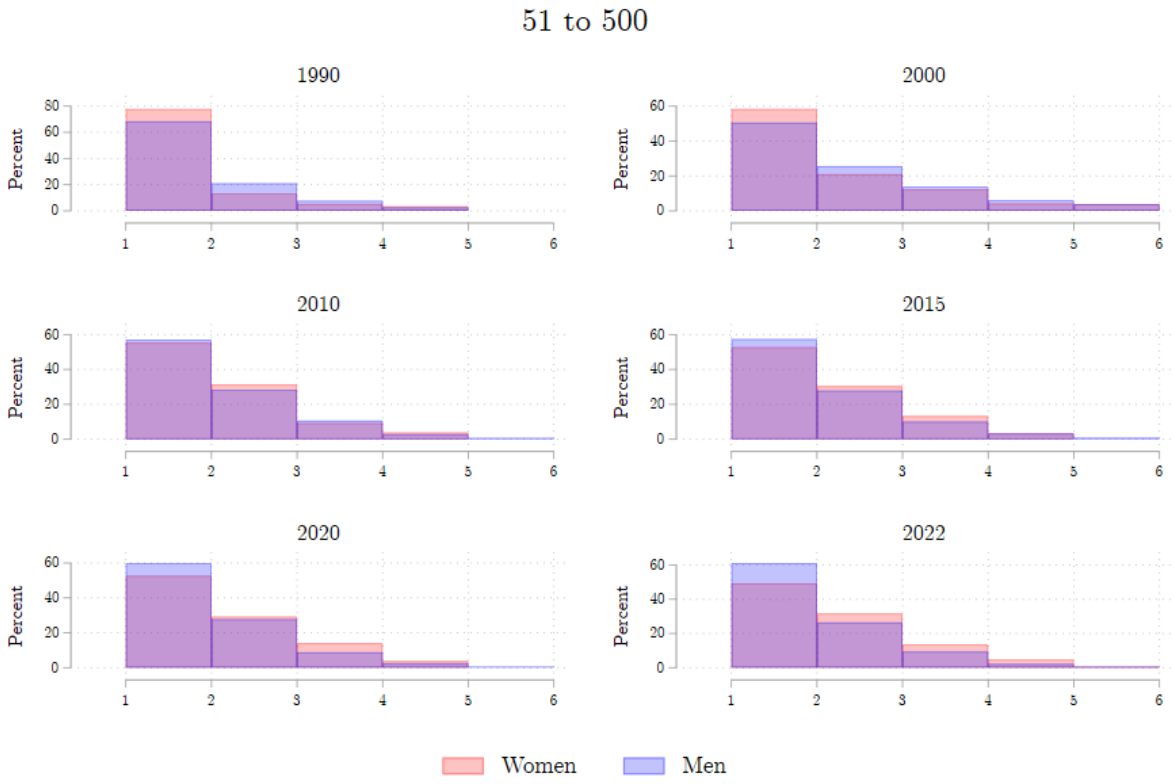


This figure plots the average age of newly appointed men (indicated with blue circles) and women (indicated with red squares) directors per year. Companies are divided into four groups by equity market capitalization in the year in question, where 1 is the largest company. Error bars represent 95% confidence intervals around the estimates, calculated using a Bonferroni adjustment to account for the fact that we are displaying 33 different estimates (one for each year between 1990 and 2022).

Figure IA.3: Distribution of Number of Board Seats Per Directors, By Gender

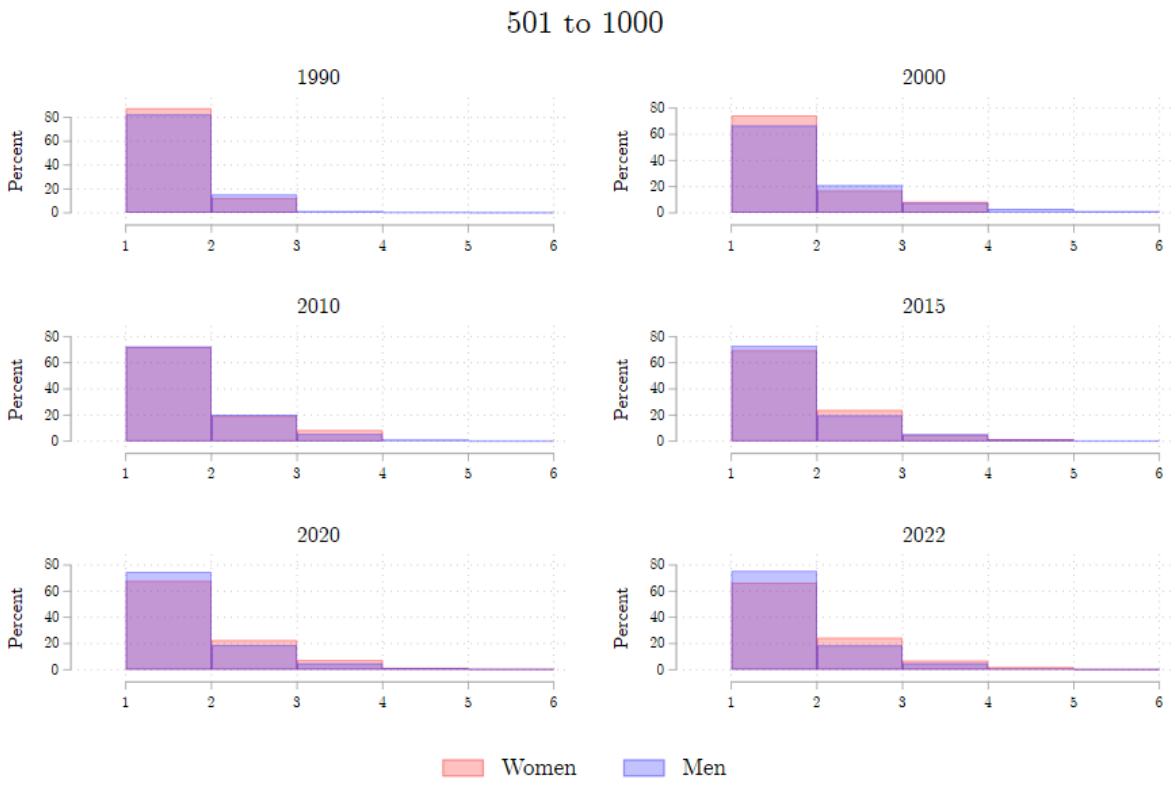
This figure presents histograms of the number of simultaneous director positions per director in the indicated year, by gender. The figure restricts attention to directors who serve on the board of one of the 50 largest companies (measured by equity market capitalization) in the relevant year. The distribution for women (men) is presented in red (blue).

Figure IA.4: Distribution of Number of Board Seats Per Directors, By Gender



This figure presents histograms of the number of simultaneous director positions per director in the indicated year, by gender. The figure restricts attention to those directors for whom the largest board on which they serve in the relevant year is ranked between 51 and 500 (measured by equity market capitalization) in the relevant year. The distribution for women (men) is presented in red (blue).

Figure IA.5: Distribution of Number of Board Seats Per Directors, By Gender



This figure presents histograms of the number of simultaneous director positions per director in the indicated year, by gender. The figure restricts attention to those directors for whom the largest board on which they serve in the relevant year is ranked between 501 and 1000 (measured by equity market capitalization) in the relevant year. The distribution for women (men) is presented in red (blue).

Figure IA.6: Distribution of Number of Board Seats Per Directors, By Gender

This figure presents histograms of the number of simultaneous director positions per director in the indicated year, by gender. The figure restricts attention to those directors for whom the largest board on which they serve in the relevant year is not among the 1000 largest companies (measured by equity market capitalization) in the relevant year. The distribution for women (men) is presented in red (blue).

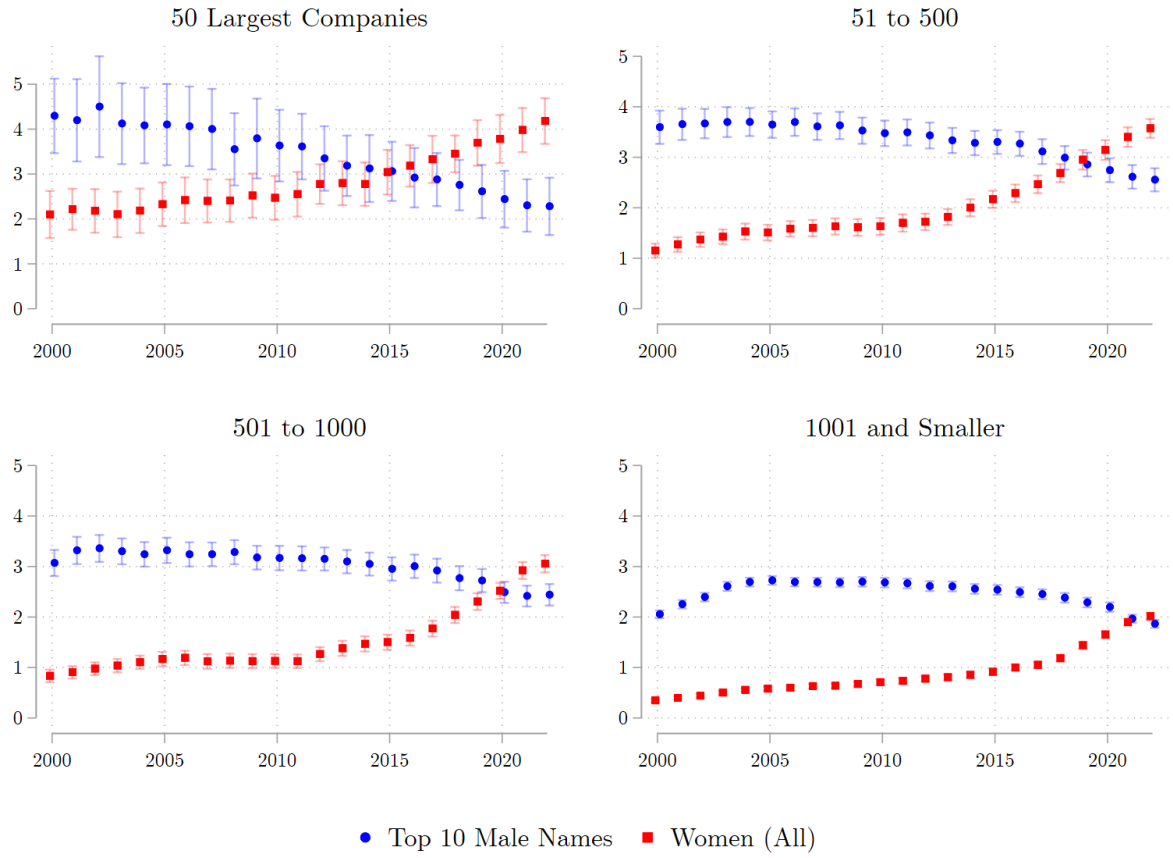
Figure IA.7: Change in Tenure of Departing Directors after the Addition of Women Directors

This figure plots the results of an event study analysis of the relationship between an increase in women directors and tenure of departing directors. The unit of observation is a company × year. $t = 0$ represents the year that the number of women increased by one (two) in the top (bottom) row. The left column uses data from 1990 through 2022; the right column restricts the sample to 2010 through 2022. The regression model is

$$tenure_{j,\tau} = \beta^{-2} \times T^{-2}_{j,\tau} + \beta^{0} \times T^{0}_{j,\tau} + \beta^{1} \times T^{1}_{j,\tau} + \beta^{2} \times T^{2}_{j,\tau} + \beta^{3} \times T^{3}_{j,\tau} + \delta \times N^{F}_{j,\tau} + \Phi_{j,\tau} + \varepsilon_{j,\tau}$$

Where $T^{k}_{j,\tau}$ is an indicator variable equal to one if year τ represents event time k for company j. The β^{k} estimates are what we plot in the figure. $tenure_{j,\tau}$ is the average tenure of departing directors of company j's board in year τ, $N^{F}_{j,\tau}$ is the number of women on company j's board in year τ, $\Phi_{j,\tau}$ is a vector of fixed effects for company j in year τ, and $\varepsilon_{j,\tau}$ is the error term. The fixed effects are company size category (which are the same as those in Figure 1), year, and company. Error bars represent 95% confidence intervals around the point estimate, calculated using standard errors clustered at the company level and a Bonferroni adjustment to account for the fact that we are displaying 5 different estimates.

Figure IA.8: Average Number of Directors with One of the 10 Most Popular Male Names and Number of Women Directors By Company Size



This figure plots the average number of directors with one of the 10 most popular male names (indicated with blue circles) and average number of women (indicated with red squares) per year. We identify the 10 most popular male names using data from the SSA, which records the most popular names in the United States from the past century (1923 to 2022) by gender (available at `https://www.ssa.gov/oact/babynames/decades/century.html`). The 10 names are James, Robert, John, Michael, David, William, Richard, Joseph, Thomas, and Christopher, as well as the following standard abbreviations of these names: Jim, Rob, Bob, Mike, Dave, Bill Will, Rich, Rick, Ricky, Dick, Joe, Tom, Thom, and Chris. Companies are divided into four groups by equity market capitalization in the year in question, where 1 is the largest company. Error bars represent 95% confidence intervals around the estimates, calculated using a Bonferroni adjustment to account for the fact that we are displaying 23 different estimates (one for each year between 1990 and 2022).