

Female Leadership in India

FIRM PERFORMANCE AND CULTURE

 Ratna Sahay, Navya Srivastava, and Mahima Vasishth

Abstract

Globally, women's share in corporate leadership has been steadily rising, including in India. The female director mandate under The Companies Act (2013) in India marked a significant step toward gender-inclusive corporate leadership, requiring listed firms to have at least one woman on their board. Within a year, the percentage of listed firms without women on board plummeted from 53 percent to less than 10 percent. Despite this progress, India still lags in the share of women in middle and senior management roles at only 17 percent, compared to nearly 33 percent for the world.

This paper documents the status of gender-inclusive corporate leadership and uses the woman director mandate in the Act to study its relationship with firm outcomes, including financial performance and corporate culture in India. Interestingly we find that firms, on average, were appointing more women than mandated by the Act, suggesting the favorable impact of the current government's signal to foster women-led development and the positive experience gained by firms. At the same time, newly appointed women were younger and more educated than their male counterparts and their average number of directorship (the "stretch factor") increased significantly compared to men.

Combining personnel-level data from NSE-listed firms with firm performance data and employing a reverse difference-in-difference econometric strategy, we find that having at least one woman on board is associated with higher economic performance and financial stability. Additionally, using almost 400,000 employee reviews scraped from a company review platform, we find that higher shares of women in board positions correlate positively with employee ratings and sentiment scores only when firms also hire women in top management positions. This analysis highlights the business case of appointing more women at the top.

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Women's
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Female Leadership in India: Firm Performance and Culture

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Contents

1. Introduction	1
2. Contribution to the existing literature	2
3. Gender gaps in corporate leadership—stylized facts	5
3.1 How did the board and management gender composition evolve?	5
3.2 What were the women board member characteristics?	11
3.3 Did the effect of the Companies Act (2013) trickle down to C-suite and middle management positions?	17
4. Gender composition of boards and firm performance	20
4.1 Sample design	20
4.2 Empirical model	21
4.3 Trends by treatment group and common time trends	22
4.4 Regression results	28
4.5 Heterogeneity by size	29
4.6 Robustness check – consistent sample of firms	34
4.7 Interpretation of results and caveats	35
5. Women in leadership positions and firm culture	37
5.1 Data description and methodology	37
5.2 Association between ratio of women in boards and firm culture	40
6. Conclusion	43
7. Policy recommendations	43
References	46
Appendix I	49
Data sources and sample – gender composition of boards and firm performance	49
Appendix II	52

Figures

1. Share of women on boards	6
2. Average share and number of women in leadership by firm size.....	7
3. Share of women on boards (march 2023) and average year-on-year change (fy 2005–06 – fy 2022–23).....	9
4. Average age of directors, by gender.....	11
5. Average minimum years of education, by gender.....	13
6. Average number of other directorships held, by gender.....	14
7. Average share of board meetings attended, by gender.....	16
8. Average share of board independence – total vs. Women vs. Men.....	17
9. Share of women in management positions in a global context.....	18
10. Share of firms in sample by number of women in leadership	19
11. Share of women in top management.....	19
12. Number and ratio of women on board by treatment group	23
13. Unconditional means and conditional differences	25
14. Unconditional means and conditional differences – subset of mid- and large-cap firms	30
15. Example of employee review from ambitionbox.....	38
A1. Average share and number of women in leadership by industry	52
A2. Average share and number of women in leadership by firm age	54

Boxes

1. The Companies Act (2013)	4
2. Status of women in the top ten firms in India.....	9

Tables

1. DiD in reverse regression results.....	28
2. DDR regression results – sub-sample by firm size.....	33
3. DDR regression results – consistent sample.....	34

4. DDR regression results – consistent sample, sub-sample by firm size	35
5. OLS with firm and review-level characteristics, for 2023.....	41
6. OLS with firm and review-level characteristics, for 2023 – sub-sample based on presence of women in top management	42
A1. Firm characteristics by treatment group	51
A2. OLS with firm and review-level characteristics, for 2023.....	56
A3. OLS with firm and review-level characteristics, for 2023 – sub-sample based on presence of women in top management	56

1. Introduction

Recognizing the wide gender disparities globally, the 2023 G20 leaders' declaration in New Delhi, highlighted the importance of women-led development and women's economic empowerment. Promoting female leaders across sectors is a priority in Indian national economic policy. Several initiatives have been taken to bridge these gaps, including implementing the Companies Act (2013), which mandated Indian companies to appoint at least one female director. This paper focuses on assessing whether this mandate has been successful and, more generally, whether women in top management positions in corporate India have increased as well. In addition, we also explore whether such increases have gone hand-in-hand with better firm performance and firm culture.

The share of women directors in corporate India at 17 percent is lower than the global average of nearly 20 percent, and substantially lower than the best-performing country, France, at over 43 percent. The number of women in chair positions decreased between 2018 and 2021 (Deloitte, 2022).

Furthermore, India lags in terms of representation of women in middle and senior management positions, with a share of only 17 percent (ILOSTAT, 2024). For context, the average share of women in senior and middle management positions is 32.4 percent for advanced economies, and 32.8 percent for the world.

In this paper, we answer three questions on women's leadership in response to this Act. First, we study the evolution of board gender composition for NSE-listed firms in India. Specifically, we document the increase in women's representation on boards following the enforcement of the woman director mandate under The Companies Act (2013) and explore the demographic characteristics of the female board members. Relatedly, we also explore whether there have been positive spillovers to appointing more women in management positions. Second, we use a reverse "difference in difference" design to isolate the effect of women on board on firms' financial performance, in terms of profits, returns, and financial stability. Third, we use rich text data on company reviews by employees to study the association between the share of women on boards and firm culture. We quantify firm culture by analyzing about 400,000 employee ratings and sentiment scores based on reviews posted on AmbitionBox.¹

There are three main findings of this paper. First, after the implementation of the Companies Act in 2014, women's share on boards in NSE-listed firms increased by 9 percentage points over the next seven years, reaching 14.1 percent in 2021. At the same time, we also find that women hired as directors after this mandate were younger and more educated than their male counterparts. These women held a greater number of directorships across firms and were more independent on average

¹ Data scraped from AmbitionBox was also used in Chakraborty and Mahajan (2023), to analyze the number of benefits provided to employees by different firms.

than their male counterparts. The gender gaps in board meetings' attendance fell as well. However, there were little spillovers in terms of increasing managerial roles for women.

Second, we find that the presence of women on boards led to better financial performance for the large and medium cap firms but not for the small cap firms. For the larger firms, we find that in the years following the mandate enforcement, there was a positive change in firms' financial indicators which was sustained over time. Specifically, we find that larger sized firms with at least one woman on boards are associated with better financial returns and greater financial stability measured by debt-equity ratio.

Third, we find that higher shares of women in board positions are positively associated with employee ratings and sentiment scores, but only for firms with at least one woman in top management.

The organization of this paper is as follows: In Section 2, we specify how our paper contributes to the existing literature. In Section 3, we present stylized facts on female leadership in corporate India, covering both directorship and management positions over time, and relative to other countries. In Section 4, we explore the relationship between gender gaps in director positions and firm-level financial performance. In Section 5, we ask whether having more women in director and top management positions is associated with better organizational culture. In Section 6, we present the conclusions of the paper. The last section proposes policy recommendations based on the analysis in this paper. From a policy perspective, these results help make a business case for hiring more women at the top.

2. Contribution to the existing literature

This paper contributes to the existing literature in several ways. As a starting point, we combine several novel data sources to construct a comprehensive database on the gender composition in boards and key managerial positions, firm performance, and organizational culture. We focus on firms listed in the National Stock Exchange (NSE) for the period 2006–2023. To study firm performance, we combine firm-level panel data on leadership personnel with financial performance data collected from annual financial statements. To quantify and study organization culture, we built a novel database by scraping text information presented in company reviews by their employees and using the corresponding sentiment scores and employee ratings to proxy for firm culture.

Second, we systematically establish a positive causal relationship between female leadership and firm level financial outcomes, which has been elusive in most of the existing national literature and scarce in the global literature. We do this by identifying an exogenous shock to Indian companies that made it mandatory to hire at least one woman on the company's board and by exploiting the quasi-random variation in the share of women on boards following this mandate.

Third, we explore and find that inclusive firm culture, as measured directly by employee reviews collected from an independent source, is associated with the presence of women directors on boards, but only when accompanied by the presence of women in top management positions.

There is a growing literature on the role of women leaders on firm performance, but the evidence has been mixed. Global evidence suggests that more female directors on board improves financial performance (Credit Suisse, 2012; Catalyst, 2015; Christiansen et al., 2016; Sahay and Cihak, 2018), but others find that the impact on firm performance is either negative (Adams and Ferreira, 2009; Ahern and Dittmar, 2012; Matsa and Miller, 2013), or zero (Bertrand et al., 2018).

Specific to India, the evidence until very recently has been mixed as well. While some studies (albeit with a smaller sample size of firms) find that a greater gender diversity on board is positively associated firm performance (Chatterjee and Nag, 2022; Duppati et al., 2019; Roy, 2023), other studies find a negative association between female leadership and firm performance, which they argue is due to an increase in the agency cost following the appointment of a female CEO (Jadiyappa et al., 2019). These mixed results can be explained by the endogenous selection of women into different types of firm, leading to a biased inference (Robb and Wattson, 2012). Jain (2022) and Roy (2023) argue that the performance depends on the gender norms in states of India where these firms are located. A shortcoming of these studies is that the relationship between female leadership and firm performance remains endogenous.

In this paper, we put together a large panel of most Indian firms listed on the National Stock Exchange (NSE) as of 2023 which includes both financial and non-financial firms. Controlling for several demographic factors at the firm level, we use the quasi-random variation in the appointment of women directors, to explain the differences in firm performance which depend on the gender gap in board directors.

The literature on female leadership and firm culture is scarce. At the global level, Callahan et al. (2024) found a positive relationship between higher shares of women on boards and the enactment of human capital development policies that benefit firm employees for a sample of S&P 1500 firms based in the US. With regard to India, we are not aware of any papers that directly look at the relationship between higher shares of women in leadership positions and firm culture, as measured by employee sentiments.

Two recent papers by Biswas et al. (2023) and Dhar (2023) respectively, have also exploited the Company's Act (2013) to establish a relationship between female leadership and firm performance. Their results confirm our findings. Dhar (2023) exploits the variation in women's representation in boards pre-mandate as an instrumental variable to find a positive impact of including women on boards on firm's financial performance. She also identifies firm culture indirectly by looking at firm's expenditure on staff welfare and training—however, expenditures do not directly measure well-being as employee surveys do. Biswas et al. (2023) finds that higher network centrality of women (i.e. their connectedness) on boards is associated with higher firm value, through their information advantage and women director networks. Our work extends the understanding of this relationship in several ways using a methodology that allows us to understand the average effect of women's representation in firms that had to respond to this policy, allowing for changes in other characteristics within the firm due to women's representation and this policy.

We also consider more measures of financial performance and firm culture than others. First, in our paper, we find evidence for the hypothesis that women contribute to greater financial stability of firms by analyzing the debt-equity ratio of firms. Second, we explore firm culture directly by quantifying employee ratings and sentiment scores, which is collected from employee reviews from an independent online platform. We also look at whether having more women directly has spillover effects in the appointment of more women managers in leadership positions. Finally, our findings on the increase in number of directorships help by women following the enforcement of the woman director mandate are consistent with Biswas et al. (2023). This may be an important channel underlying our results on the positive impact of increased representation of women relative to men on firm performance, through increased network that women bring in relative to men.²

BOX 1. The Companies Act (2013)

The Companies Act (2013) was passed by the parliament and approved by the President of India on the 29th of August, 2013. Some of its provisions were implemented by a notification published on the 12th of September, 2013. The initial deadline imposed by the Securities and Exchange Board of India (SEBI) for meeting the mandate regarding women directors was October 2014. This deadline was later pushed to the 1st of April 2015.

As per the Companies Act, 2013, it is mandatory to appoint at least one woman on board in certain types of companies. The penalty for non-compliance of provision extends to a fine of Rs. 10,000 with a further fine of Rs. 1,000 per day if the contravention continues. A woman director has to play the role like any other director. Women directors can hold a maximum of twenty directorships that includes the sub-limit of ten public companies. Any contravention on this part shall be subjected to a fine ranging between Rs. 5,000–Rs. 25,000.

² This is discussed in more detail in Section 3.2 of this paper.

A woman director may leave the company for any reason such as resignation, removal, automatic vacation or retirement by rotation before the expiry of her term as a Director. The Board of Directors must fulfil this vacancy known as intermittent vacancy within a period of three months. In case of an absence of a woman director for a period of not less than three months, the board must appoint an alternative director to ensure the smooth functioning of the company. The alternative director shall leave the firm after the return of the woman director. In case there are more than one woman on the board, it is optional for the company to appoint an alternative director. A woman director can hold the position of director until the next Annual General Meeting from the date of appointment. She is also entitled to seek for reappointment at the general meeting. The tenure of women director is liable to retirement by rotation similar to other directors. Like any other director, a woman director can also tender her resignation any time before the expiry of her term by giving a notice to the company.

A company, whether a public company or a private company, will be required to appoint at least one woman on board if it fulfils any of the following criteria: (1) it is a company whose securities are listed on any stock exchange; (2) it is a company with a paid-up capital of rupees one hundred crore or more and a turnover of rupees three hundred crores or more.

3. Gender gaps in corporate leadership—stylized facts

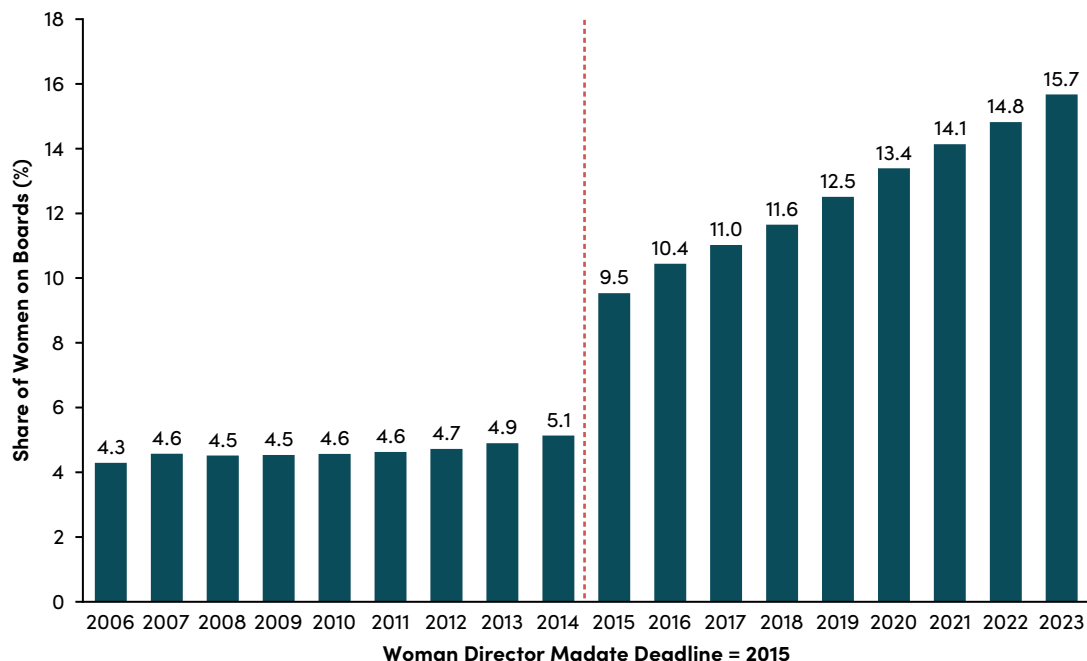
As compared to other parts of the world, the share of women directors in corporate India at 17 percent is lower than the global average of nearly 20 percent, and substantially lower than the best-performing country (France) at over 43 percent. The number of women in chair positions decreased between 2018 and 2021 (Deloitte, 2022).

We first look at the trends in female directorship in India before and after the implementation of the Company's Act (2013), and then explore whether there has been a positive spillover of hiring women in boards under the Company's Act (2013) on top management positions in firms.

3.1 How did the board and management gender composition evolve?

Although the Companies Act was officially implemented in 2013, the deadline for meeting the woman director mandate was set for April 1 2015. Figure 1 shows a jump in the share of women in boards in 2015. This step-increase was observed for both financial and non-financial firms. This is shown in Appendix II, Figure A1.

FIGURE 1. Share of women on boards



Source: PRIME Database.

Younger firms established after liberalization in India (in 1991) have a higher share of women in leadership positions, for both boards and top management. In fact, for top management positions, this difference was almost 10 percentage points in 2023. This indicates that younger firms are embracing diversity more often than older firms, which appear to exhibit more rigid cultural norms (Appendix II, Figure A2).

Figure 2 indicates that small-cap firms have higher shares of women on their boards than mid-cap and large-cap firms. The number of women on boards experienced a jump for small firms in 2015, while board size remained relatively stable. However, it is important to note that given the smaller size of boards for small firms, and the fact that these firms had less than one woman director on average before the mandate, a large jump in the share of women post-mandate is expected. Implementing a mandate on the number of women (instead of share) also naturally caused the share of women for firms with much smaller boards to become very large, overtaking the average share for larger firms after 2015. Therefore, these shares may not be representative of the actual hiring behaviours and environment within the firms.

Smaller firms also have more women in managerial positions on average, despite having fewer managerial personnel in total. Since we expect large industry leaders to set a higher standard for gender equality in the corporate sector via a demonstration effect, we consider the case of top ten large cap firms (based on market capitalization in 2023) in Box 2.

FIGURE 2. Average share and number of women in leadership by firm size

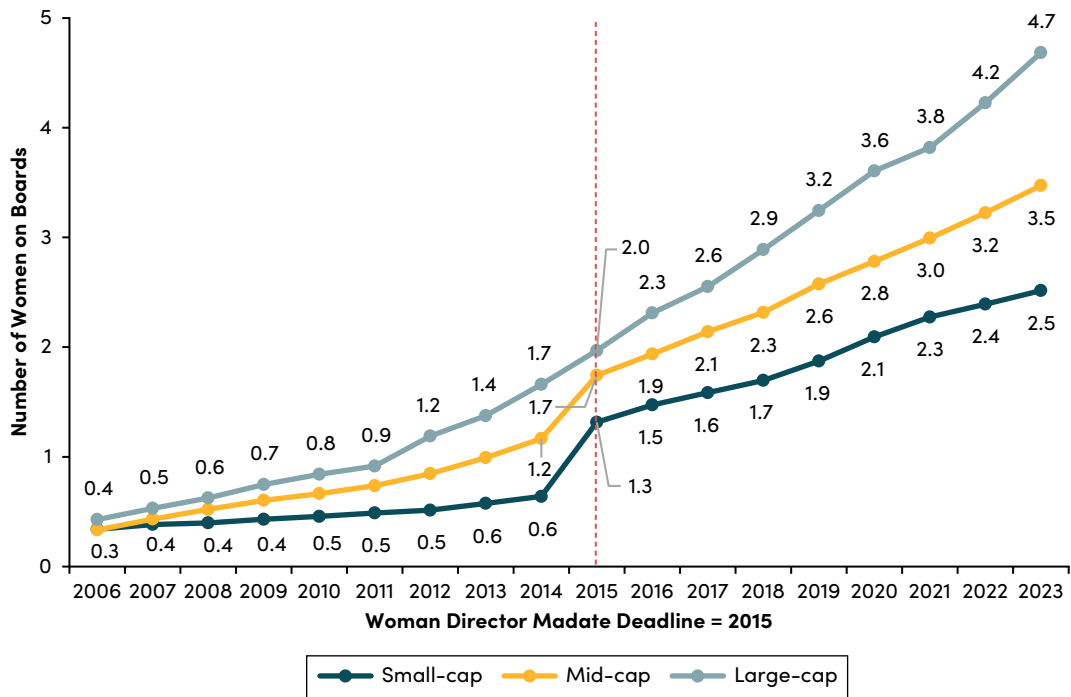
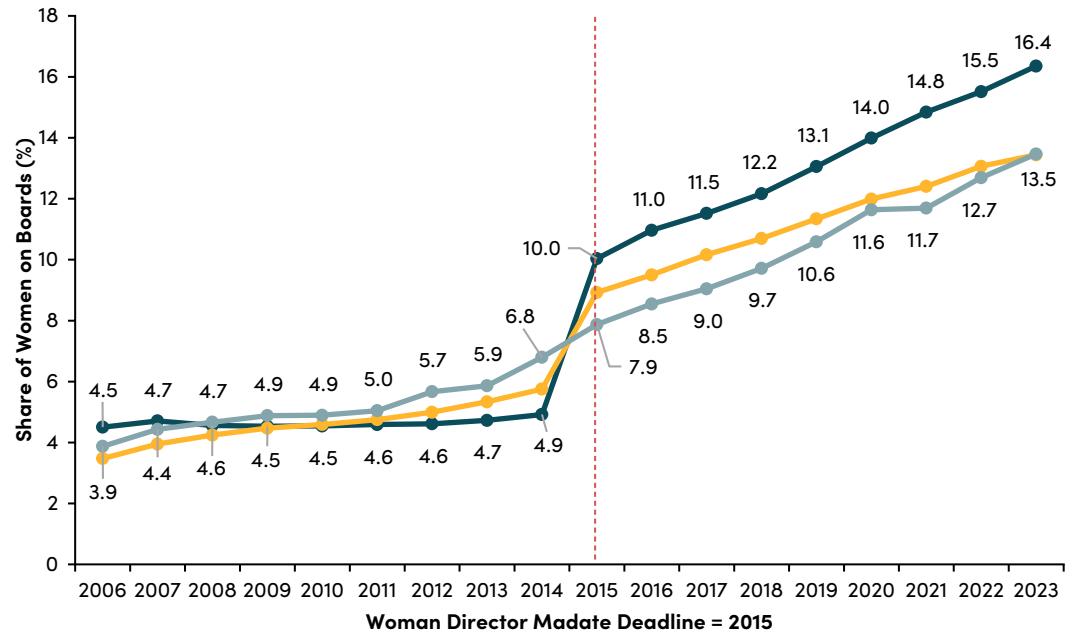
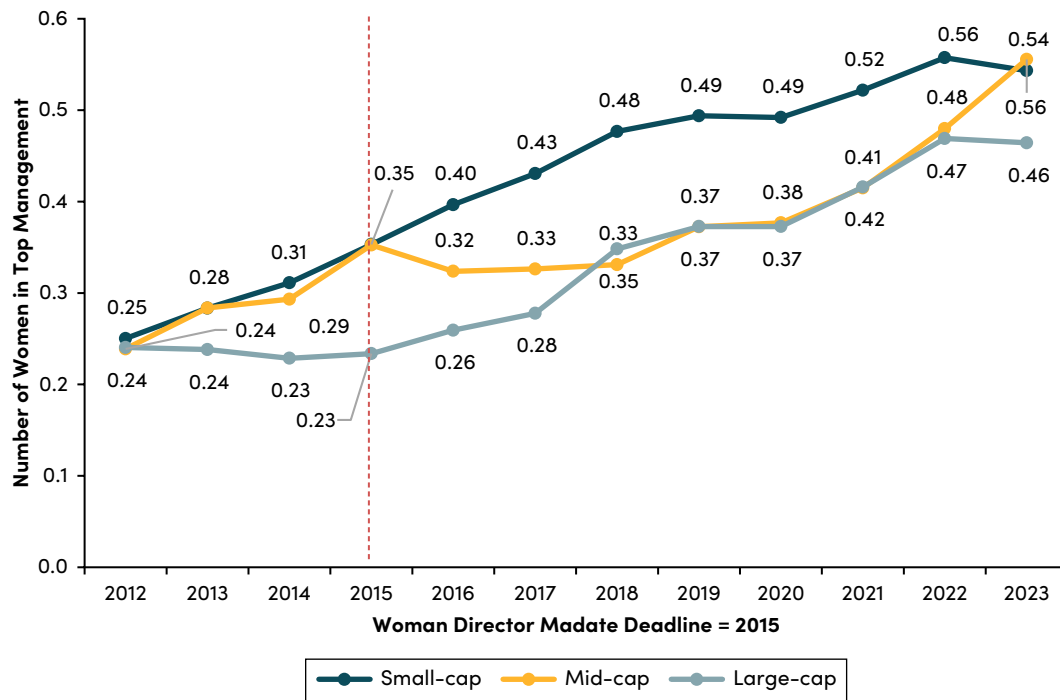
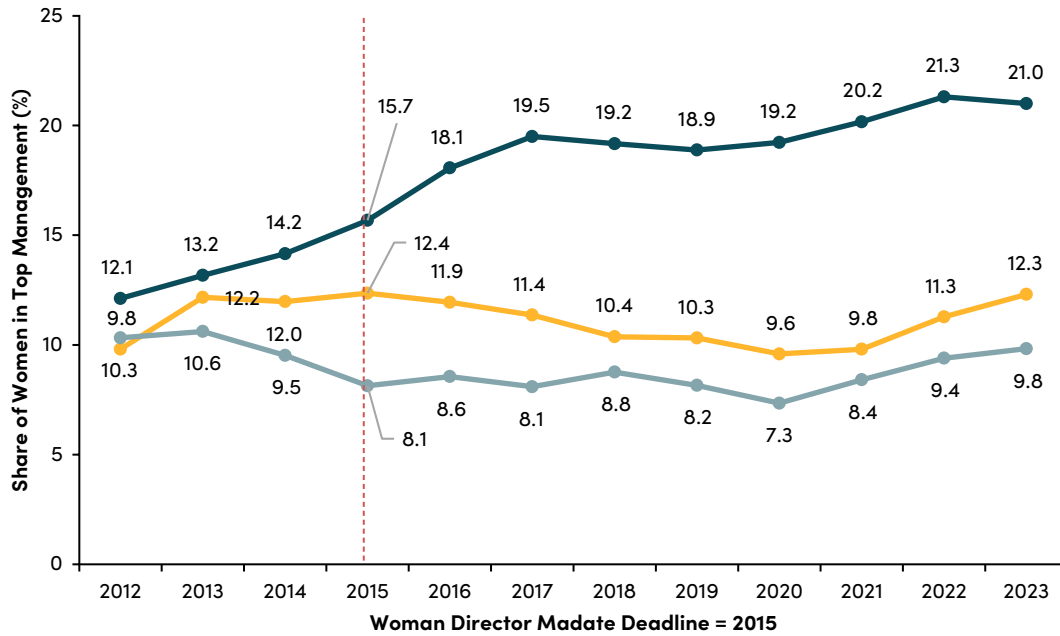


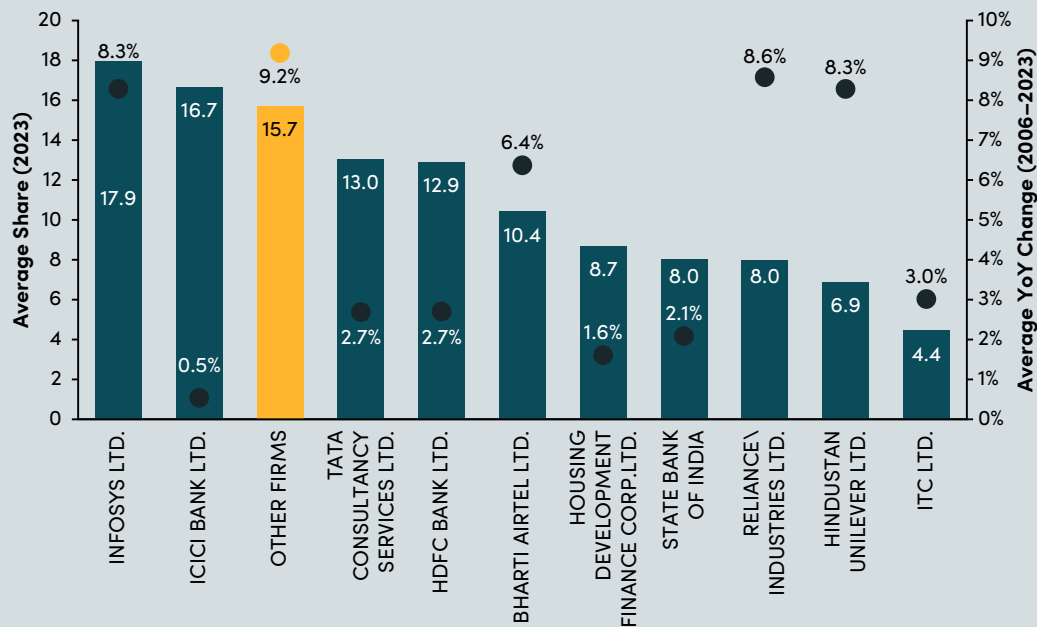
FIGURE 2. (Continued)



Source: PRIME and CMIE Database.

BOX 2. Status of women in the top ten firms in India

FIGURE 3. Share of women on boards (march 2023) and average year-on-year change (fy 2005–06 – fy 2022–23)



Notes: The share of women on the boards as of March 2023 (represented by green bars for top ten firms and orange bar for all other firms on average) are shown on the left-hand side y-axis. The average year-on-year percentage change in the share of women in boards over the entire period of observation (2006–2023) for these firms are represented by dots and shown on the right-hand side y-axis.

Source: PRIME and CMIE databases. List of top ten firms were based on market capitalization as of March 2023, and was cross-checked using NSE India.

Best performers

Of the top ten firms, Infosys Ltd. and ICICI Bank Ltd. performed better than the industry average with regard to director positions. Infosys Ltd appointed four additional women board directors between 2014–16, taking the total to six. All women appointed were independent, and the average level of education for women increased significantly, surpassing that of men in the two years following the mandate’s announcement, thus alleviating “tokenism” concerns or concerns that the average quality of women fell after the director mandate. While women were better educated and held more committee membership and chair positions than their male counterparts, their remuneration was, on average, lower than men’s. In contrast to a rising number of women directors, the top management team (including C-Suite positions) in Infosys Ltd. had no women throughout the sample period.

ICICI Bank Ltd. had the highest number of women (nine) on their boards out of the top ten firms, as of March 2023. Given the large board size of 54 members, the share remained relatively low, with a low average year-on-year percentage increase. Similar to the industry average, the women hired were younger and more educated compared to their male counterparts. They held about the same number of chair positions on committees and had higher remuneration on average. We also find that there were positive spillovers to hiring women in C-Suite positions—throughout the period there were one to two women among the four to seven-member top management team.

Worst performers

Hindustan Unilever Ltd. and Reliance Industries Ltd. were the only firms that did not have any women prior to the woman director mandate. They appointed one woman each in the year the mandate was enforced. As a result, both firms showed two of the highest rates of increase in the share of women on boards, at 8.3 percent and 8.6 percent respectively. This is somewhat misleading as the starting point was low, and despite the high rate of increase, their share of women directors in 2023 was the lowest in this group. Both firms only hired one additional woman director in the years following the mandate. Additionally, Reliance Industries Ltd. had no independent women on board until as late as March 2019. Moreover, in both these companies no woman director chaired any committee until April 2021. Interestingly, the women directors had lower education and remuneration on average relative to their male counterparts. Reliance Industries Ltd. had no women in top management until FY 2018–19, and Hindustan Unilever Ltd. had none throughout our sample period.

ITC Ltd. was the worst performing firm in terms of share of women directors as of 2023. The first female director was appointed in late 2012 and one other in later years. Women on average were younger and more educated and held no chair positions on committees (despite holding more membership positions than their male counterparts). ITC Ltd. also had no women in their top management team throughout our sample period.

It is worth pointing out that although the State Bank of India had a relatively low share of women, it had the second-highest number of women on board (tying with Infosys Ltd. with 7 female board members). On the other hand, participation of women in board committees as chairs was almost zero, and as members remained lower than that of men for most years. During 2019–2021, there were no women in top management despite an expansion in their size from 6 to 9 members.

3.2 What were the women board member characteristics?

In addition to gender composition, we also looked at five director-level characteristics: education, age, number of other directorships held, share of meetings attended, and hiring of independent directors. This enables us to assess whether their characteristics were different from men's and proxy for whether they played an active role in board decisions.

Age of Directors

Following the enforcement of the mandate, there was a sharp decrease in the average age of women. Figure 4 shows that any new women added to the directors' pool following the mandate were significantly younger than both their male counterparts and the women already on boards before the mandate was enforced.

FIGURE 4. Average age of directors, by gender

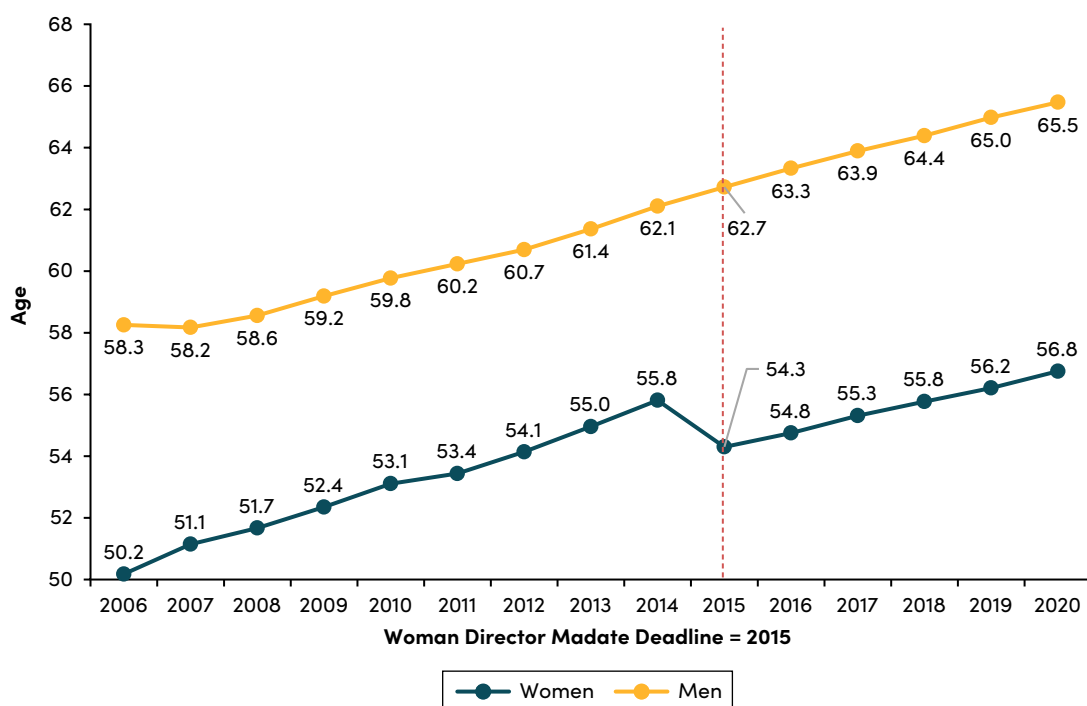
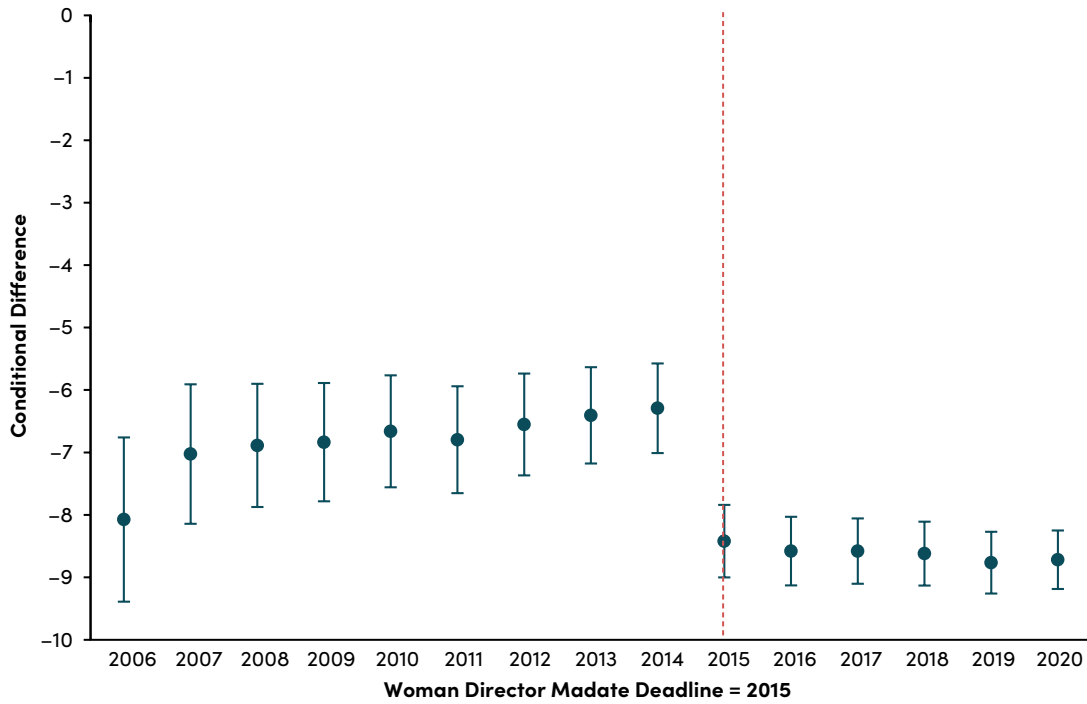


FIGURE 4. (Continued)

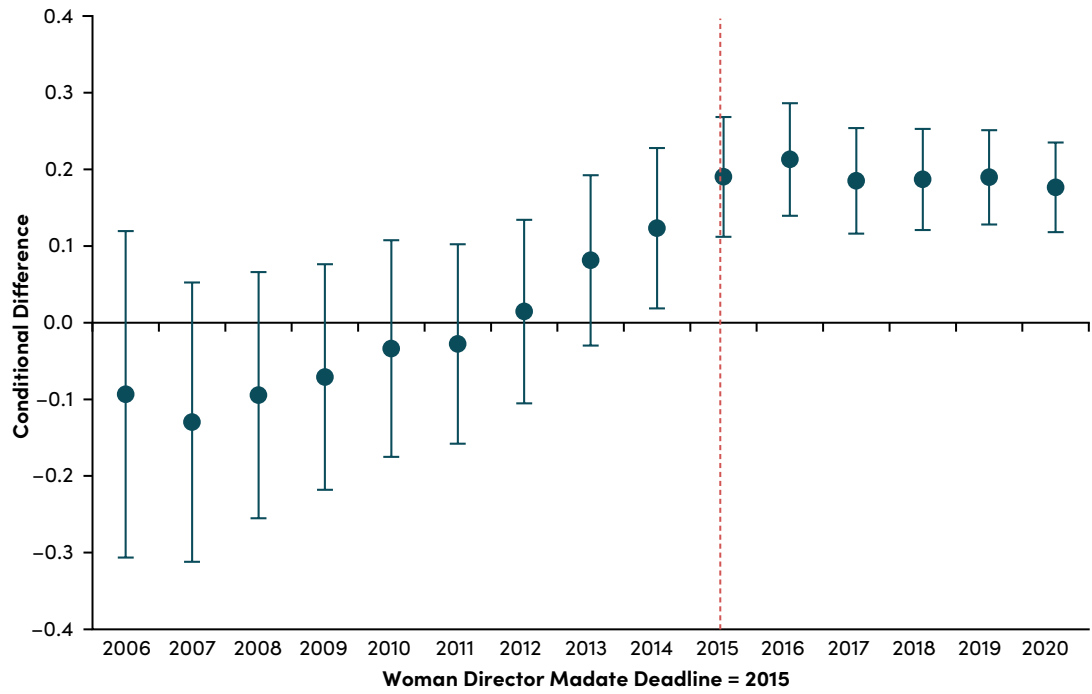
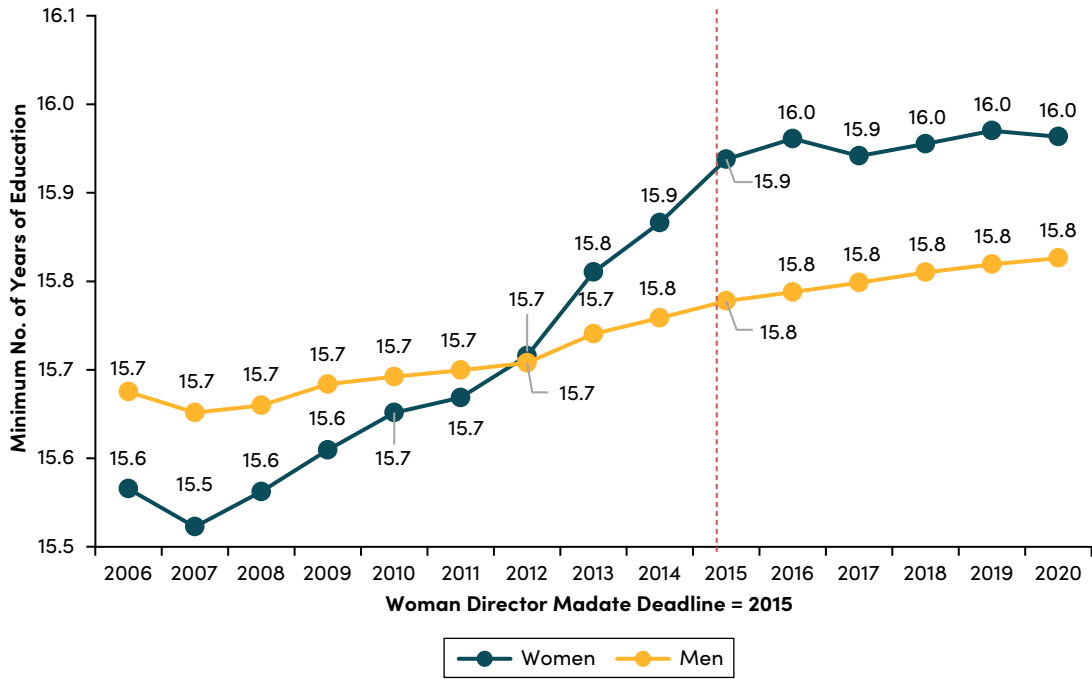


Notes: Age difference between women and men, conditional on year. The bars show the 95% confidence interval.
Source: PRIME Database.

Education level

Figure 5 shows the educational profile of both women and men being hired before and after the implementation of the mandate. The average (minimum) number of years of education for women caught up with the average for men around 2012, and became significantly higher (conditional on age) starting from 2015. The average education for women has also been consistently increasing at a faster rate compared to that of men, which remained comparatively flat throughout the period. In sum, following the enforcement of the woman director mandate, women on boards were significantly younger and more educated than their male counterparts.

FIGURE 5. Average minimum years of education, by gender



Notes: Education level difference between women and men, conditional on age and year. The bars show the 95% confidence interval.

Source: PRIME Database.

Number of other directorships held

Figure 6 shows that on average, women held fewer other directorships compared to men before the implementation of the mandate in 2014. There were also fewer unique women in the pool of directors compared to men before 2015 (around 928 unique women compared to around 15,541 unique men). Although the approximate number of unique women increased after the implementation of the mandate (to around 4,677 unique women after 2015), this increase was not enough to keep up with the mandate requirements of having at least one woman on board. Consequently, the same women were hired across multiple boards. Furthermore, the approximate number of unique men increased at a faster rate compared to women post-mandate (to around 28,000 after 2015), which likely contributed to a decrease in the average number of other directorships held by men. In general, although the mandate allowed multiple directorship of women on corporate boards, the pool of women did not expand fast enough to comply with the mandate. This could reflect supply (shortage of qualified women) or demand-side factors (conscious or unconscious bias in hiring) or both. The demand side factors seem more binding, given that women being hired were more educated than men.

FIGURE 6. Average number of other directorships held, by gender

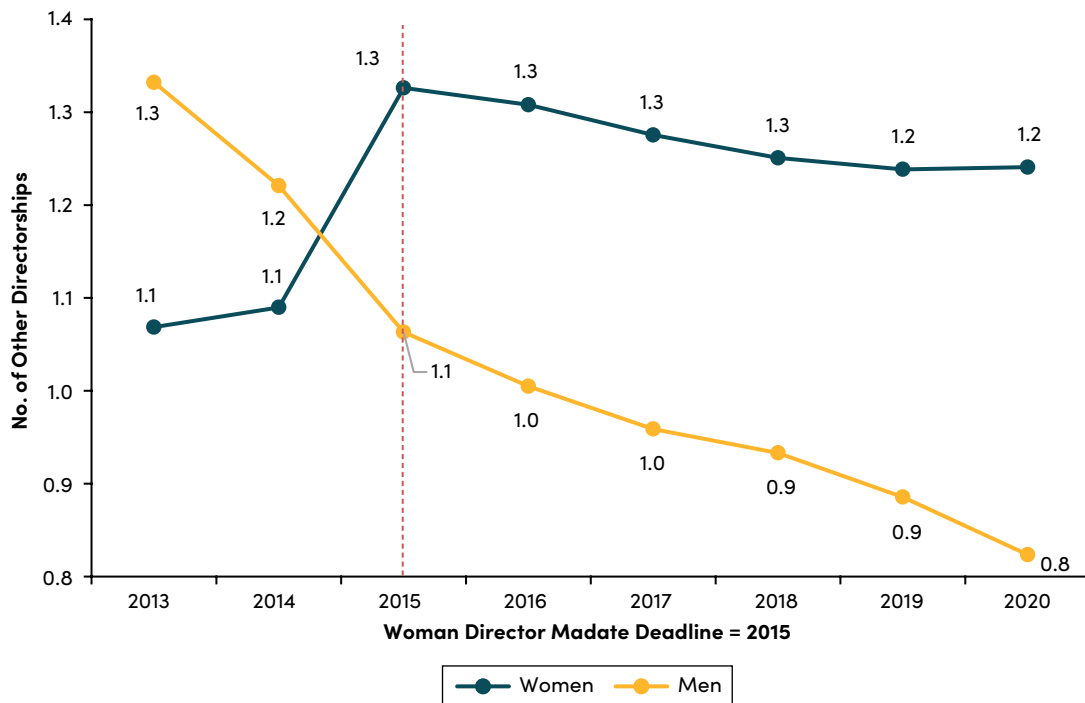
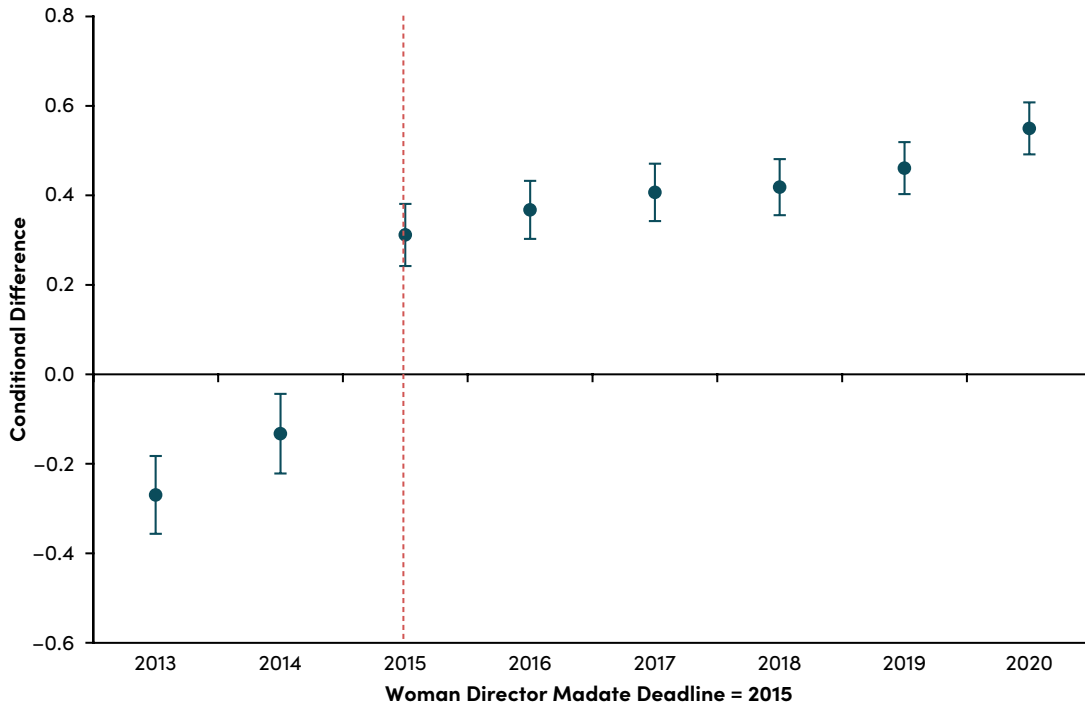


FIGURE 6. (Continued)



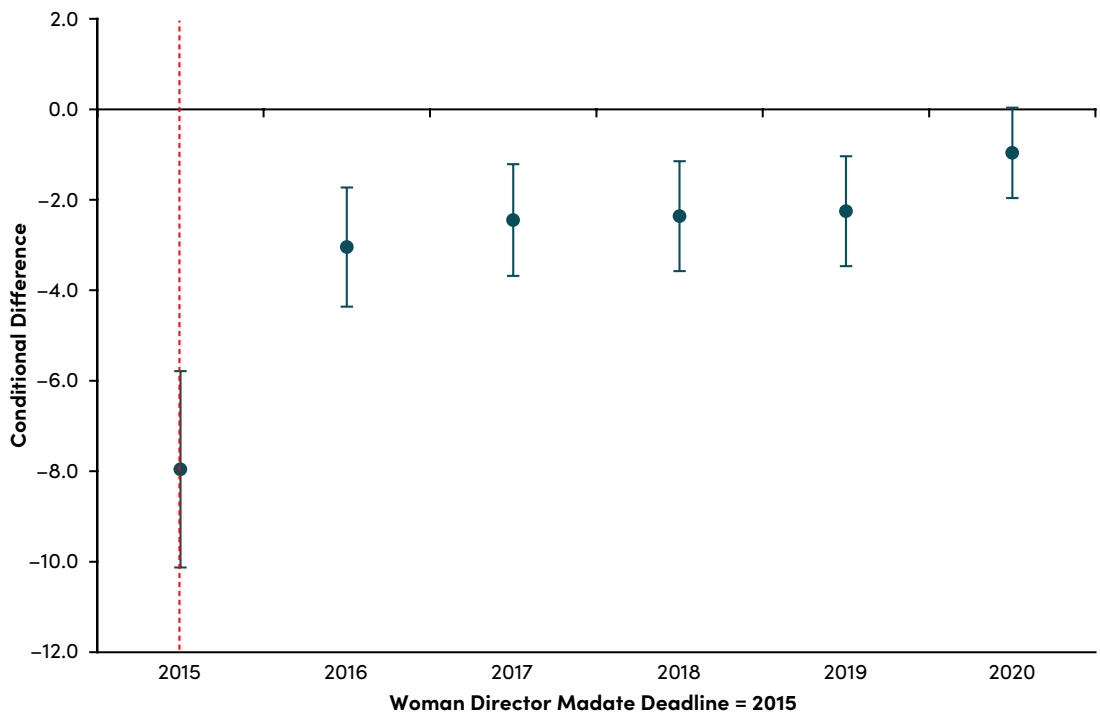
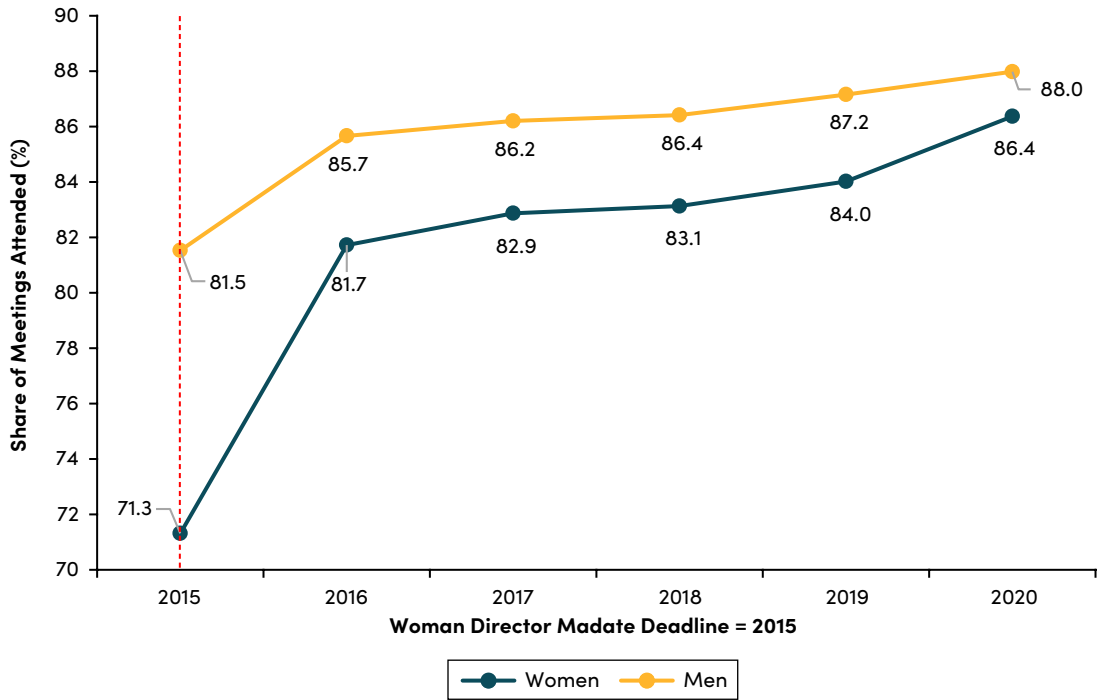
Notes: Difference in multiple directorship between women and men, conditioned on year, education, and age. The bars show the 95% confidence interval.

Source: PRIME Database.

Board meeting attendance

It is also interesting to note that the average share of board meetings attended by women (an indication of participation in decision-making) was significantly lower than that of men in the years following the implementation of the mandate (Figure 7). However, this gap has been slowly closing, as more firms hire more than one woman on their boards, leading to greater gender diversity. Despite this, there is still a gender gap in the meeting attendance, implying that women are still not able or willing to attend more meetings. This could reflect female discomfort with male-dominated boards or the disproportionate burden of unpaid care work on women. The absence of women in board meetings reduces the ability of women directors to participate fully in firms' decision-making processes.

FIGURE 7. Average share of board meetings attended, by gender

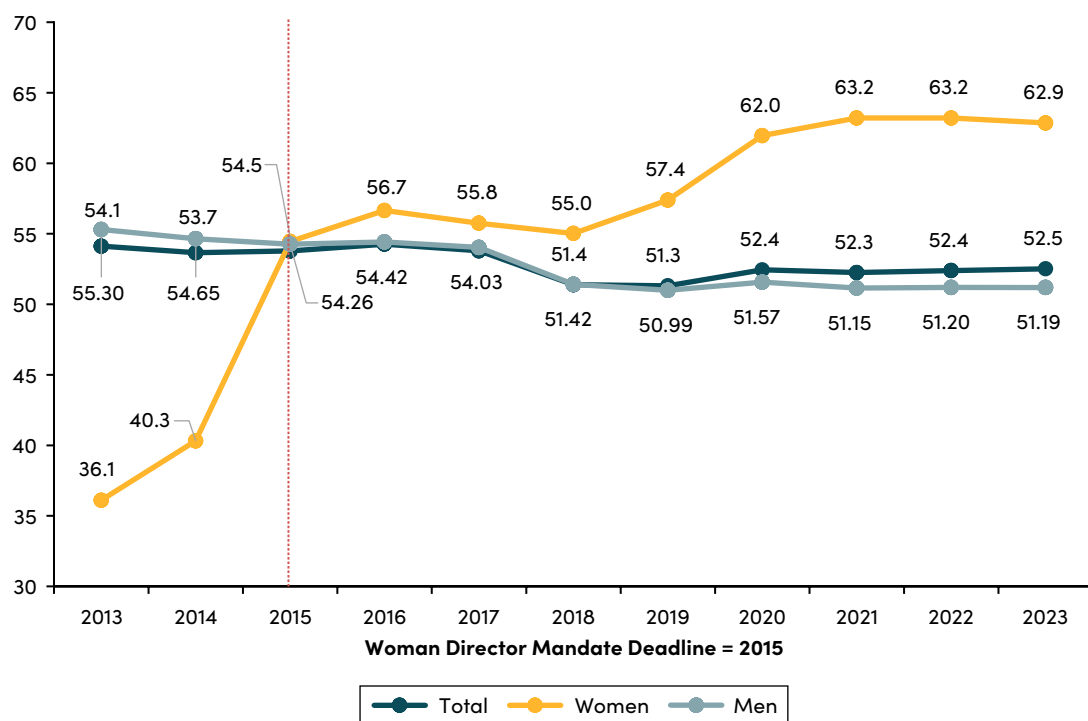


Notes: Board attendance difference between women and men, conditioned on year, education, and age. The bars show the 95% confidence interval.

Source: PRIME Database.

Board independence

FIGURE 8. Average share of board independence – total vs. Women vs. Men



Source: PRIME Database.

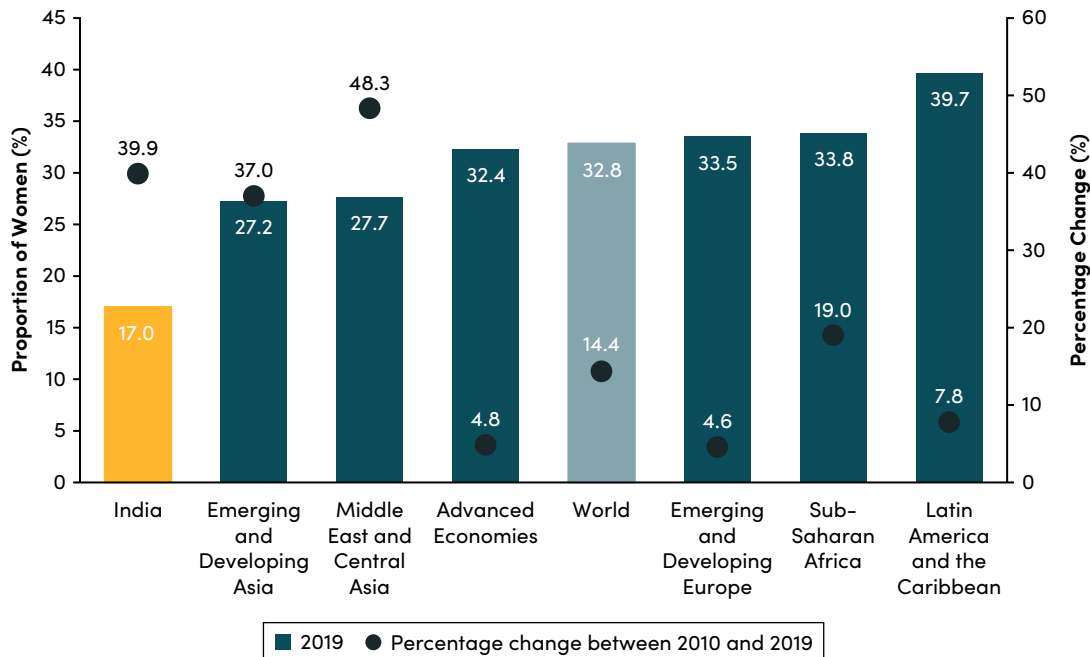
A key criticism of implementing a mandate to improve gender diversity on boards is that such mandates may lead to “tokenism”, where firms appoint insiders with connections to the owners or current board members simply to meet a quota. However, data on director independence paints a different picture. As it can be seen in Figure 8, the share of independent women on boards (out of total women) did not see a decrease following the mandate. In fact, the share of independent women directors surpassed the share of independent men directors, and remained higher throughout the post-mandate period. The total level of board independence remained flat throughout.

3.3 Did the effect of the Companies Act (2013) trickle down to C-suite and middle management positions?

We document gender gaps in management positions in India relative to other countries, as reported by the International Labor Organization. This is defined as the number of women employed in middle and senior management as a percentage of total employment in management. The data for this indicator is available for 69 countries in 2010 and for 96 countries in 2019. We calculate group averages using IMF’s definitions for country groups and track the progress for these groups relative to India over a 10-year period (2010–2019) for which comparative data are available.

Figure 9 shows that presence of women in top management position is the lowest for India relative to other regions and compared to the global average, even though the rate of increase is among the highest during 2010–19.

FIGURE 9. Share of women in management positions in a global context

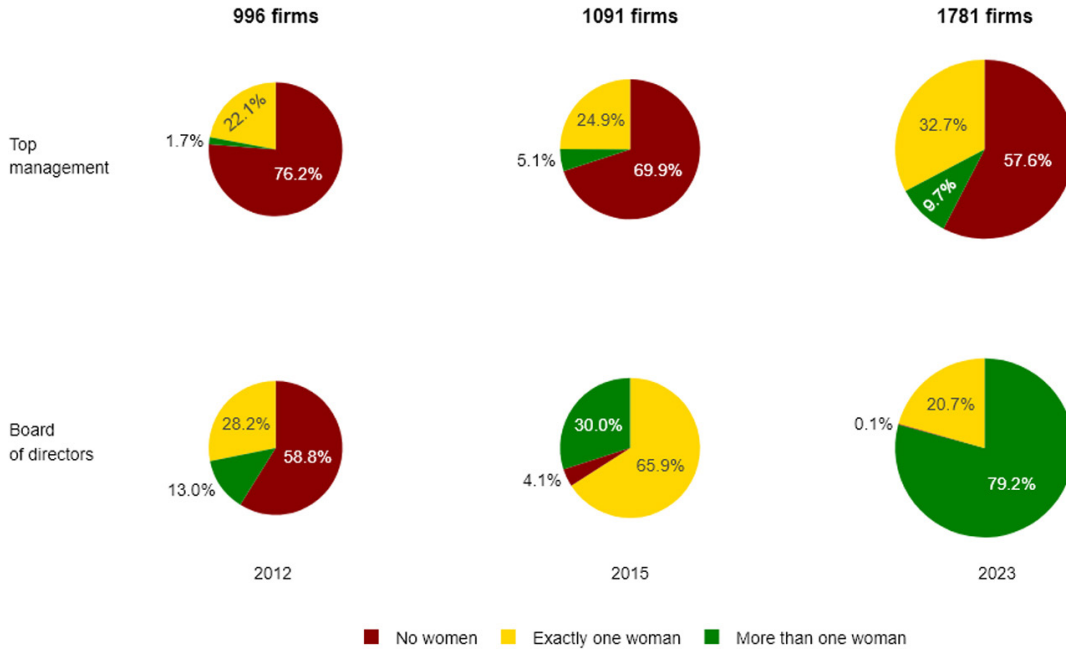


Source: ILOSTAT.

We next explore if there were positive spillovers from the female director mandate to management positions in India. The mandate has been successful in that the share of firms with no women on board dropped from 58.8 percent in 2012 to 4.1 percent in 2015, as observed in Figure 10. Furthermore, many firms went beyond the mandate and appointed additional women post-2015. The proportion of firms in the sample with two women or more increased from 13 percent in 2012 to 30 percent in 2015, and reached nearly 80 percent in 2023.

With regard to management positions, there is little evidence of positive spillovers. More than 50 percent of NSE-listed firms had no women in the top management team in 2023, 33 percent had only one woman, and less than 10 percent had more than one woman. This is concerning as Post et al. (2021) find that women’s integration in top management team is effective only when there is more than one woman in such teams.

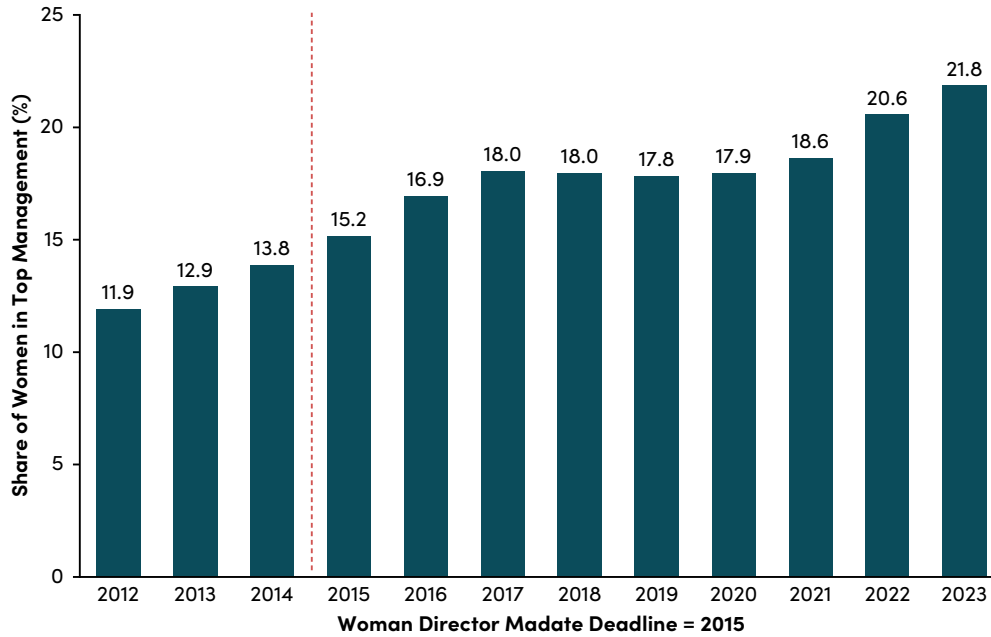
FIGURE 10. Share of firms in sample by number of women in leadership



Source: PRIME Database.

The absence of spillovers from the director mandate to management positions is confirmed in Figure 11 below, where no jump in the share of women in top management (C-suite) positions is observed following the implementation of the mandate.

FIGURE 11. Share of women in top management



Source: PRIME Database.

4. Gender composition of boards and firm performance

To establish a causal effect of female representation on boards on firms' financial performance, we use the external shock stemming from the implementation of the Companies Act (2013), and divide firms into policy "unaffected" and policy "responders" groups.

4.1 Sample design

A firm is in the "responders" group if it is an NSE-listed firm and has had no women board directors prior to the enforcement of the mandate in 2015, but subsequently appointed at least one woman to their board by the deadline. The "responders" group, therefore, contain only compliers for the purpose of our study. This led to the dropping of 11 non-complying firms from our original sample. The "unaffected" group has firms that already had women on their board before the mandate was implemented.

The year firms were affected by the mandate is defined as the later of the two years: the first year the firms were listed or 2015 (the year the Companies Act was enforced). 2015 is taken as the enforcement year because the Companies Act came into force in October 2013, and the deadline to meet the mandate was April 2015.

Firms that were listed on the NSE after 2015 had to be dropped for two main reasons. The first reason relates to a lack of relevant information on these firms. Our database starts recording board information for firms either from 2006 or from the year they were listed on the National Stock Exchange (NSE). Therefore, if firms were listed after the mandate deadline (2015) and they had at least one woman on their board in the first year of observation, we do not have any information on whether the woman was appointed before the firm's mandate deadline (classifying the firm as "unaffected"), or after the deadline (classifying the firm as a "responder"). Second, even if we knew the year when the first woman was appointed to the board, if they were not listed by 2015, they could have still been affected by the changes in hiring environment and the general move towards equitable gender representation in boards. Including these firms in the "unaffected" group rather than the "responders" group could therefore bias our empirical estimates downwards, and vice versa if they were not affected by the changing environment. By dropping the firms that were listed after 2015, the treatment year for all firms included in the sample is 2015.

We begin our sample with 2580 firms for which data on both financial performance and board-related composition and characteristics are available. We exclude 684 firms that were listed after 2015 for reasons noted in the previous paragraph. We then drop an additional 424 firms for which either pre- or post-treatment observations were not available. Finally, we remove 59 firms that were unlisted after the mandate was implemented. The final sample size for estimation purposes, therefore, includes 1413 firms, of which 707 firms are in the "unaffected" group, and 706 are in the

“responders” group. Of the 706 “responders”, 11 firms are non-compliers, and 695 firms are compliers. After dropping these 11 firms, we finally have 707 “unaffected” firms and 695 “responder” firms.

4.2 Empirical model

To find the impact of hiring at least one female board member on financial performance of firms, we exploit the exogenous policy shock of the Companies Act (2013), and implement a difference-in-differences (DiD) in reverse strategy a la Kim and Lee (2018). Since all firms in our sample either have to or already comply with the mandate, we do not have treatment and control groups. Instead, we have an “always treated” (unaffected) group and a “switched” (responder) group. The always treated group had women on their board even before the Act was implemented, and therefore did not need to change their hiring behavior. The switched group did not have any women on their board after the act was implemented, and therefore had to change their behavior.³

The following DiD in reverse model is estimated:

$$Y_{it} = \alpha + \delta D_{it} + \beta_1 size_{it} + \beta_2 traded_{it} + \gamma_i + \theta_t + \epsilon_{it} \quad (1)$$

where Y_{it} is the outcome (financial indicators) for firm i at time t , $size_{it}$ is a dummy fixed effects variable for the three categories of firms—large, medium, and small cap, $traded_{it}$ is a dummy variable indicating whether firm i was traded on the stock market (either NSE or BSE) at time t , D_{it} is a treatment dummy as explained below, and γ_i and θ_t are firm and time-fixed effects, respectively.

The dummy D_{it} gives the treatment status of firm i at time t . Since we have responders (switched firms) and unaffected firms (always treated firms), D_{it} is calculated in the following way:

$$D_{it} = 1 - Q_i + Q_i I_{[t \geq 2015]} \quad (2)$$

where Q_i is equal to 0 if firm i is a “policy unaffected” firm and equals 1 if the firm is a “policy-responder.” The term $I_{[t \geq 2015]}$ is equal to 1 if the year is equal to or greater than 2015, and 0 if not. This means that D_{it} for a “policy unaffected” firm is equal to 1 throughout the sample period. On the other hand, D_{it} for a “policy-responder” is 0 before 2015 and 1 thereafter.

Here, we can interpret “treatment” as a firm’s willingness to hire at least one woman on board, either at their own volition or due to the mandate (thus reflecting hiring behavior that can be interpreted as more gender diverse at the director level). Intuitively, the treatment dummy D_{it} reflects this, and takes the value 1 for unaffected firms throughout the time period (given their willingness to hire at least one woman without the need for a mandate). Similarly, it takes the value of 1 for responder group only after 2015, given that their willingness to hire at least one woman switched following the mandate. Since the DiD in reverse model is simply a traditional DiD model which has been linearly

3 Only 5 listed firms had no women on their board during the sample period. We assume that all women who were appointed in FY 2014–15 was in response to the mandate.

transformed by the term $\delta(1-Q_t)$, our coefficient estimate δ will be equal for both the DiD and the DiD in reverse model. However, by implementing the DiD in reverse model, we are able to account for the fact that the average impact of having at least one woman on board (following the willingness to appoint at least one woman) would be driving financial performance of the unaffected firms throughout the time period, while for responder firms, this impact would kick in only after the implementation of the mandate.

For the DiD in reverse model to yield unbiased results, a key assumption that needs to be made is that in the absence of the mandate, the financial outcomes of the two groups would have followed the same trend over time, even if there are systematic differences in the value of the financial outcomes. Given that this assumption is plausible, we can take the behavior of the unaffected firms in the post-period as the counterfactual.⁴ We then estimate the “catch up” by responder firms over the years following the implementation of the mandate, which gives us an estimate of the post-period effects of the mandate on responder firms.

We use event study plots to visualize the similarity or difference in trends between unaffected and responder firms, taking 2014 as the base year. This also helps us to visualize the effect of the implementation of the mandate at each point in time starting in 2015.

For this, we run the following regression:

$$Y_{it} = \alpha + \lambda_t (Q_i * year_t) + \beta_1 size_{it} + \beta_2 traded_{it} + \gamma_i + \theta_t + \epsilon_{it} \quad (3)$$

where λ_t represents the systematic difference in value of the average financial outcomes between unaffected and responder firms at time t . We take 2014 as the base year, when the difference in the value of the financial indicators between the two groups is normalized to zero. Our hypothesis is that λ_t should not be significantly different from zero before the year of treatment (2015) for the parallel trends assumption to hold.

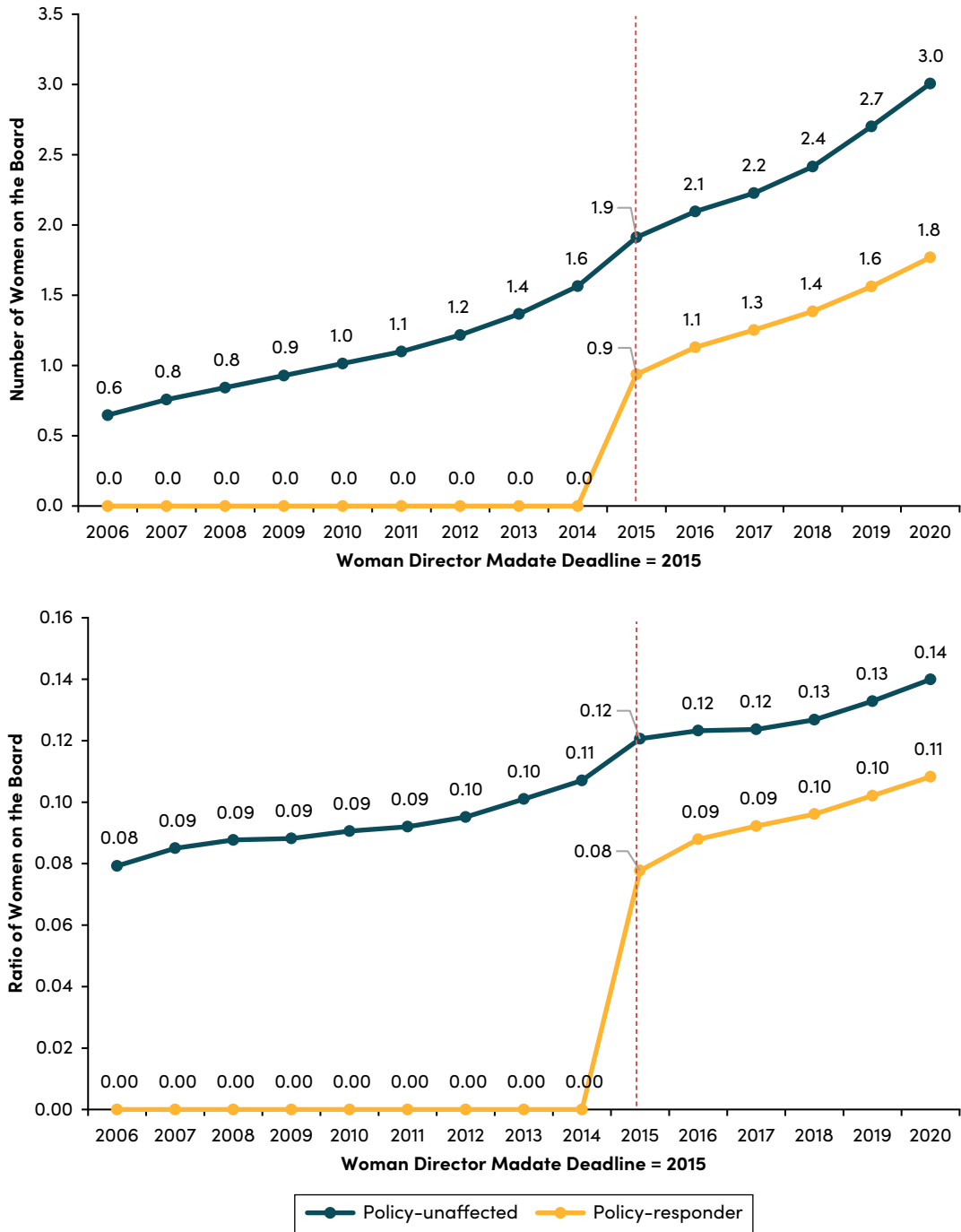
Event study plots for profits after tax, returns on net worth, and debt-to-equity ratio are presented in and discussed further in the next section.

4.3 Trends by treatment group and common time trends

Since the policy was implemented on 12th September 2013, and the deadline for compliance was eventually set for 1st April 2015 (end of FY 2014–15, represented as 2015 in our dataset), we assume that most of the women being hired as a response to this policy were appointed during 2015. We can observe the jump in the average share of women on boards for responder firms in Figure 12, while the trend for unaffected firms remains relatively flat. The dotted red line shows the deadline for the mandate (end of FY 2014–15, represented by 2015 in our dataset).

.....
 4 Following Kim and Lee (2018), this is a plausible counterfactual if the condition of common trends in the pre-treatment periods between the two groups is met.

FIGURE 12. Number and ratio of women on board by treatment group



Source: PRIME Database.

Appendix I Table A1 provides a detailed description of firm characteristics by treatment group—the unaffected and responder groups.

Figure 13 shows event study plots for three firm outcomes: profit after tax, return on net worth, and debt-to-equity ratio.⁵ These graphs plot the coefficients λ_t (as described in equation 3) for all years except for 2014, which is taken as the base year and normalized to zero. Therefore, the coefficients for each year show the conditional differences between responder and unaffected firms.

For all three event studies, the λ_t coefficients are not significantly different from zero in the pre-mandate period, confirming the plausibility of the parallel trends.

For profit after tax, the average difference between outcomes for responder and unaffected firms with respect to 2014 is insignificant and very close to zero in the pre-mandate period. There is a jump in the year after mandate enforcement (2016), and the conditional differences in the post-mandate years shows that on average, there is a positive catch-up (indicated by the positive mean), leading to a lower conditional difference between the two groups. Similar trends can be seen for returns on net worth and the opposite can be seen for debt-to-equity ratio. However, the jump (and the corresponding “catch up” for policy responders) following mandate enforcement is not as significant for returns on net worth, and the effect of the mandate seemingly diminishes in the following years, reaching pre-mandate difference in 2020.⁶

For debt-to-equity ratio, unaffected firms on average have consistently had higher debt-to-equity ratios, both before and after the mandate’s enforcement. However, this difference seems to be widening in the years following mandate enforcement, as the average debt-to-equity ratio for policy responders is pushed downwards. However, conditional on firm fixed effects, size, and trading status, the event study plot shows that this change in the debt-to-equity ratio for responders with respect to unaffected firms is small and insignificant.

5 Profit after tax (given in Rs. million) has been adjusted for inflation using FY 2011–12 as the base year. Additionally, all measures of financial performance have been transformed using the inverse hyperbolic sine function in order to reduce bias introduced by outliers in the data.

6 Furthermore, most of the difference between average post- and pre-mandate conditional difference between policy-unaffected and policy-responders seems to be driven by the fact that the financial crisis in FY 2008–09 seemingly hit responders harder, widening the difference between the two groups. This is plausible, since policy-responders are, on average, smaller, and by association, less likely to be able to absorb external shocks.

FIGURE 13. Unconditional means and conditional differences

Profit After Tax (2011-12p)

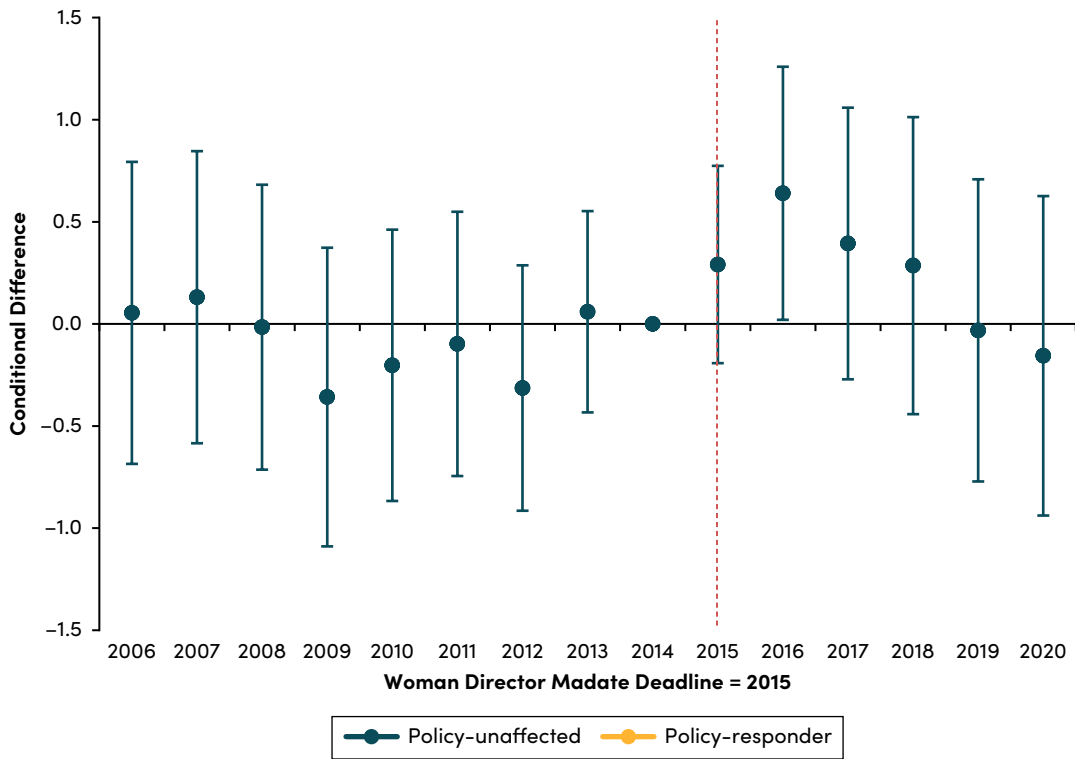
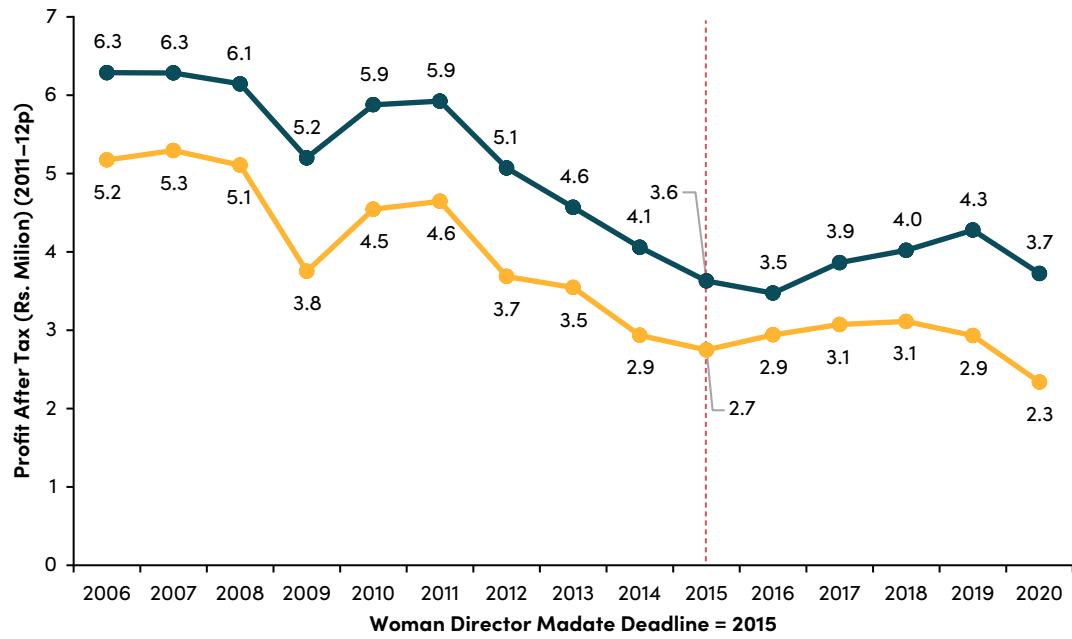
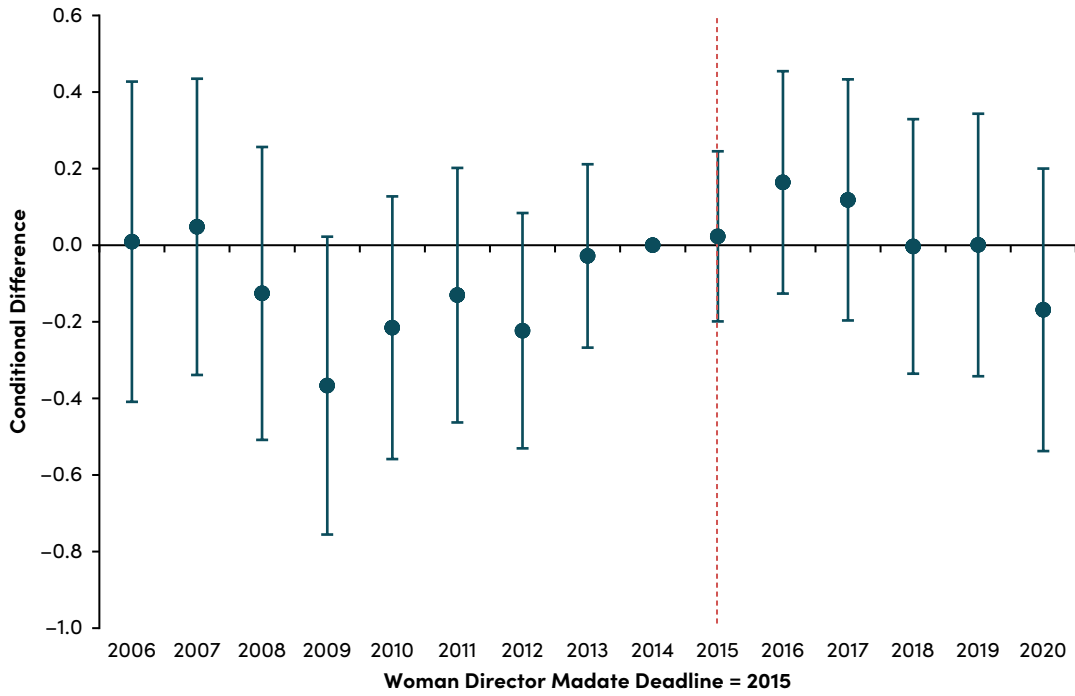
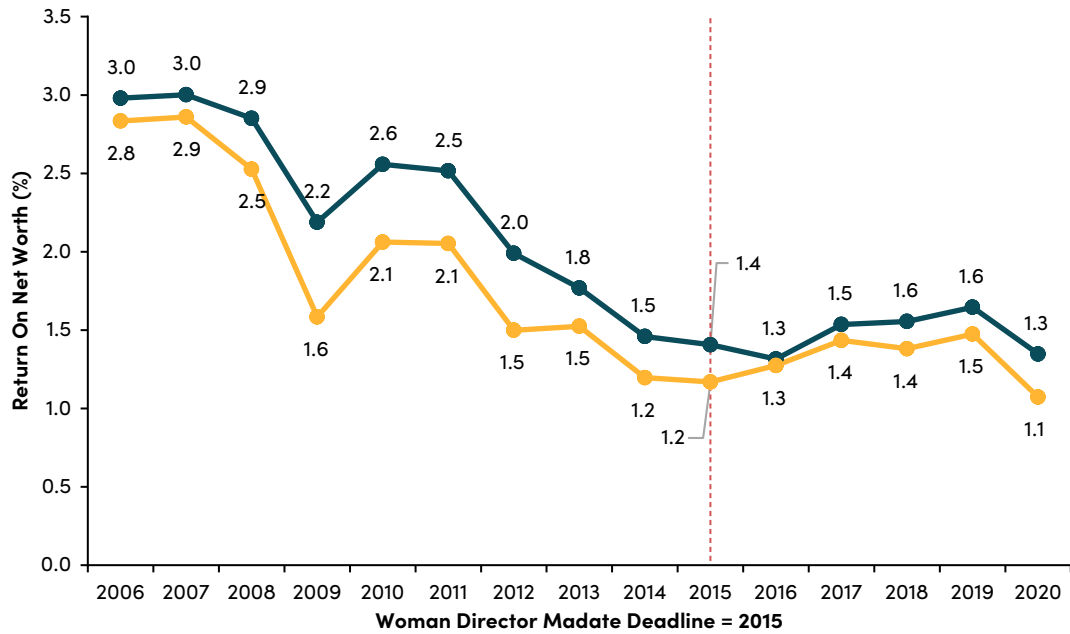


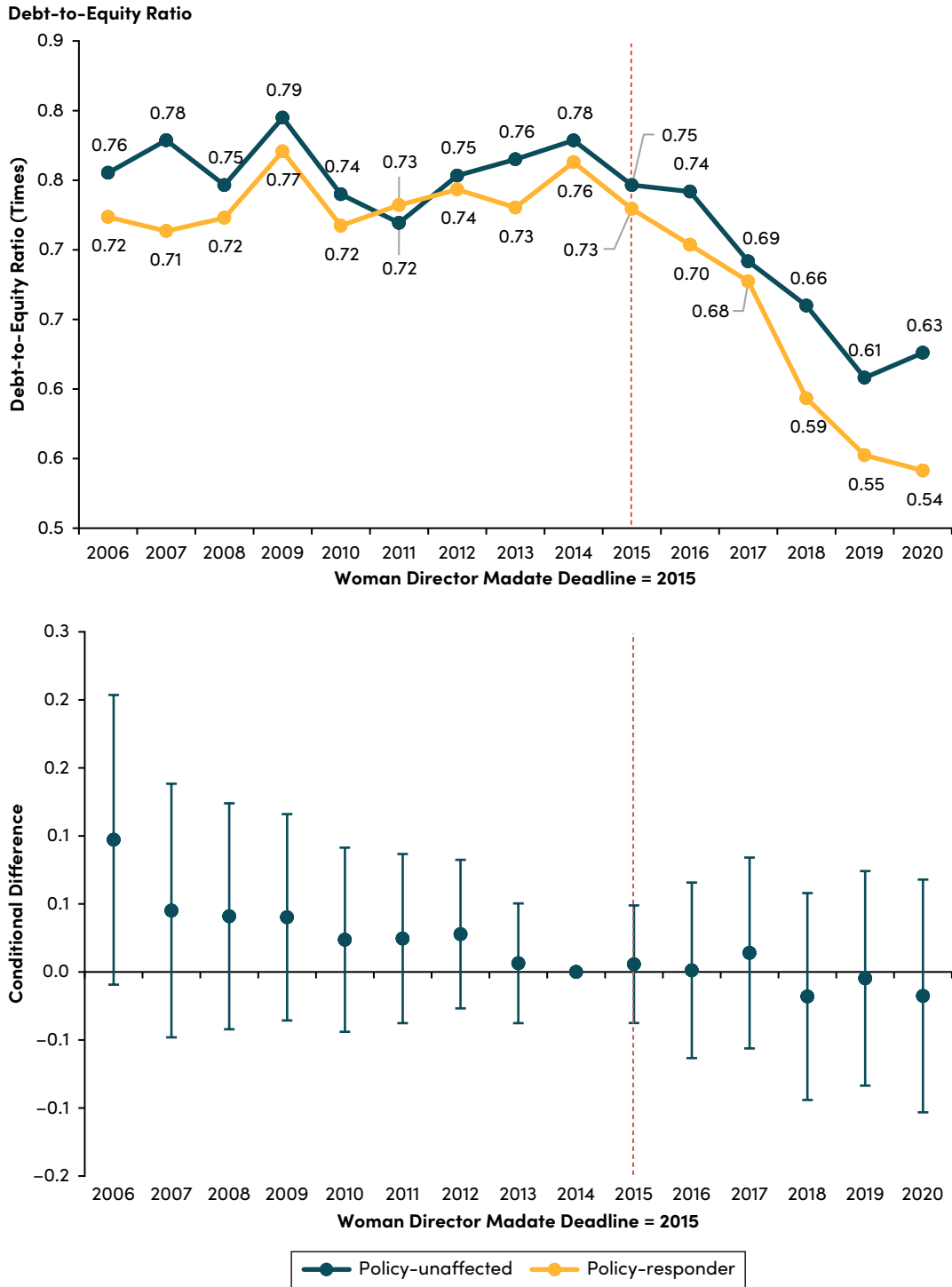
FIGURE 13. (Continued)

Return On Net Worth



● Policy-unaffected ● Policy-responder

FIGURE 13. (Continued)



Notes: All indicators have been transformed using the inverse hyperbolic sine (I.H.S.) function, to reduce the effect of outliers. The bars show the 95% confidence interval.

Source: PRIME and CMIE Database.

4.4 Regression results

Table 1 shows the result of the difference-in-difference (DiD) in reverse regression, controlling for firm size, trading status, and firm and year fixed effects. Following the mandate's enforcement, firms that did not have any women on board and therefore had to appoint at least one woman experienced 34 percent higher profits, 14.6 percent higher returns on net worth, and 3.1 percent lower debt-to-equity ratio. However, these are not statistically significant.

Following our observations from the event study plots (Figure 13), it is possible that the insignificant results are driven by the fact that the jump following the mandate did not result in consistently lower differences between responder and unaffected firms. For profit after tax, the difference between the two groups reverted to pre-mandate difference around 2018, while for returns on net worth, the mandate effects seemingly diminished in 2017.⁷

TABLE 1. DiD in reverse regression results

	Profit After Tax (Rs. Million) (2011–12p)	Return on Net Worth (%)	Debt to Equity Ratio (Times)
[1 – Responder + (Responder * Post)]	0.340 (0.243)	0.146 (0.116)	–0.0313 (0.0289)
Traded dummy	Yes	Yes	Yes
Size FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	17587	16647	16591
Mean of Dep. Variable	4.160	1.803	0.712

Notes: Standard errors (in parentheses) are clustered at the firm level. Dependent variables are transformed by the inverse hyperbolic sine function. *p < 0.10, **p < 0.05, ***p < 0.01.

Source: Authors' Calculations.

The coefficient refers to the DiD-in-reverse treatment dummy, which is equal to 0 for responder firms and 1 for unaffected firms before policy implementation (before 2015) and 1 for all firms after policy implementation (2015 onwards). The coefficient represents the difference between the average difference in financial performance between unaffected and responder firms after policy implementation (when both groups have the same treatment state) and the average difference between unaffected and responder firms before policy implementation (when responder firms are “not treated”). Therefore, the coefficient shows average “catch up” in financial performance indicators for responder firms, with respect to the unaffected firms following the enforcement of the mandate.

7 It is also important to note the impact of the financial crisis of 2008–09 (represented as 2009 in our data) on our final estimate. Policy-unaffected firms were seemingly less affected by the financial crisis, and there might be an upward bias in our final treatment effect because of this.

We expect the effect of hiring at least one woman on boards where there were previously none on firm performance to differ across different types of firms. Our hypothesis is that larger firms with more resources and better benefits (in all positions) to attract and retain more women on boards show better results. This is tested in the next section.

4.5 Heterogeneity by size

We run separate regressions on sub-samples of two groups: (i) small-cap firms, and (ii) mid- and large-cap firms. The sample is divided based on the average size group of firms throughout the period of observation, rather than the size group of the firms in a particular year. We do this to reduce the effect of large spikes in firm performance (resulting in changes in a firm's market capitalization, and by association, current size group) on the sample selected.

We divide the sample into the two size groups to allow for changes in the coefficients because there may be structural difference in the relationship between firm performance and the presence of female directors.

The event studies for only the sample of mid- and large-cap firms are given in Figure 14. For larger responder firms, the change in conditional differences following mandate enforcement did not revert to pre-mandate differences as quickly as it did for small-cap firms. This ability to maintain the jump in performance in the years following the mandate led to a more consistent shift in firm performance for these firms. In other words, there was a significant positive effect of the mandate on these firms.

FIGURE 14. Unconditional means and conditional differences – subset of mid- and large-cap firms

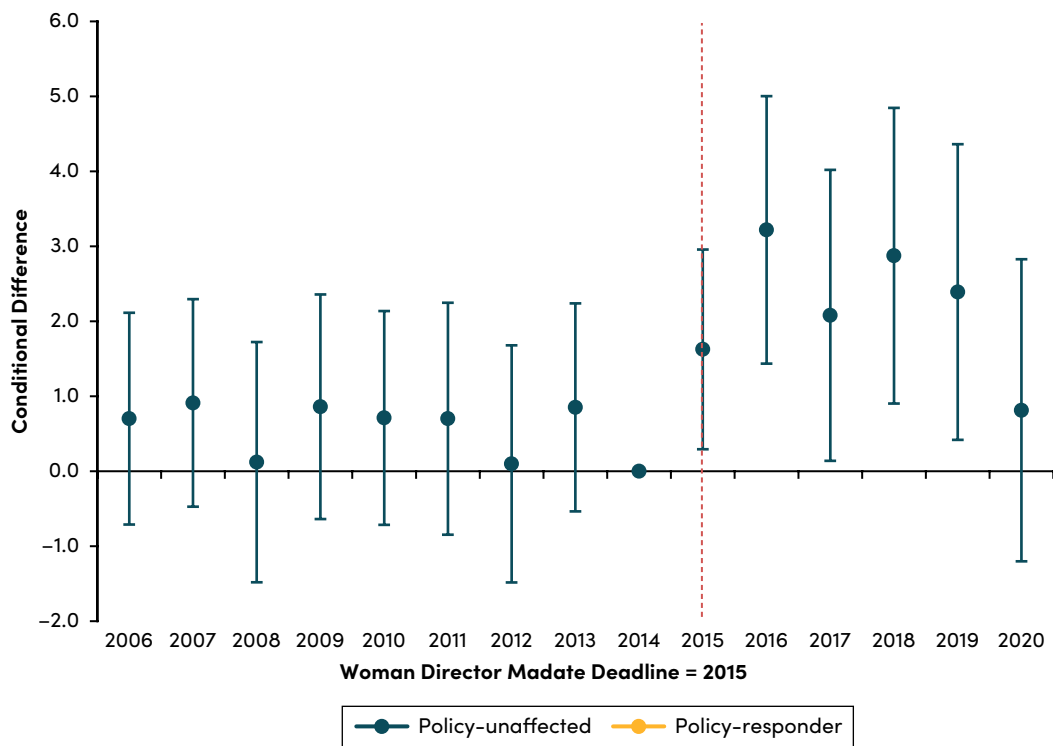
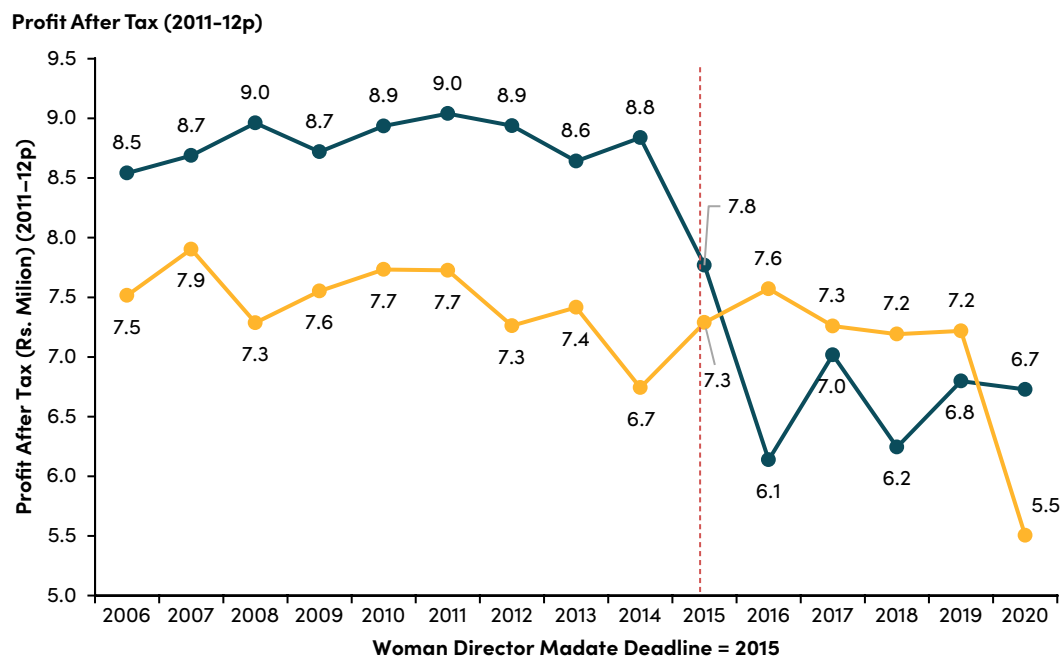


FIGURE 14. (Continued)

Return On Net Worth

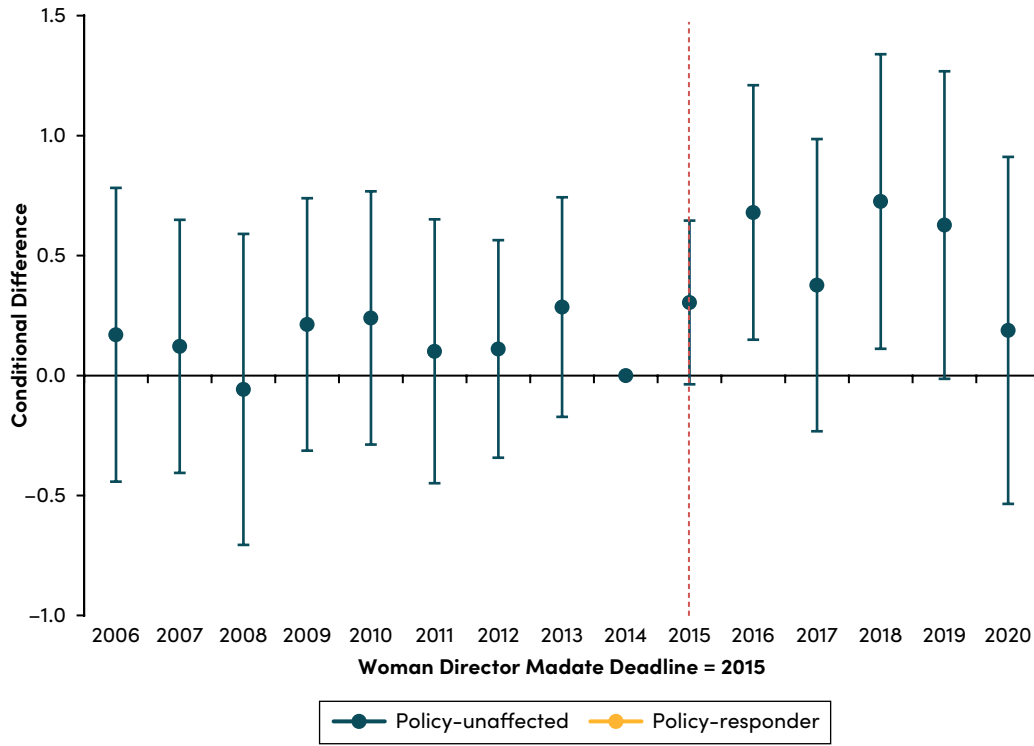
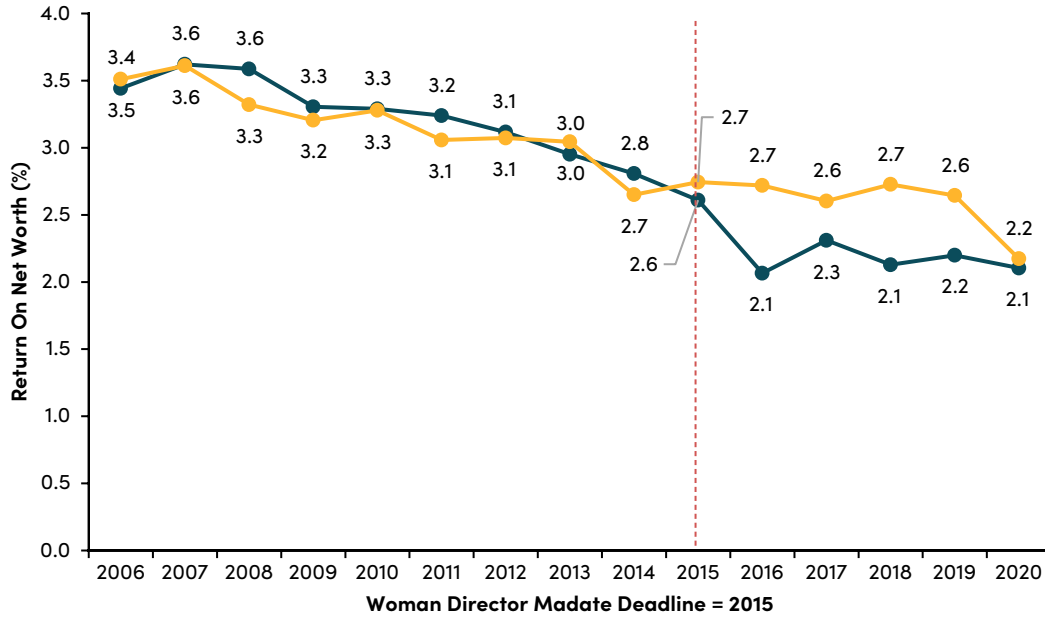
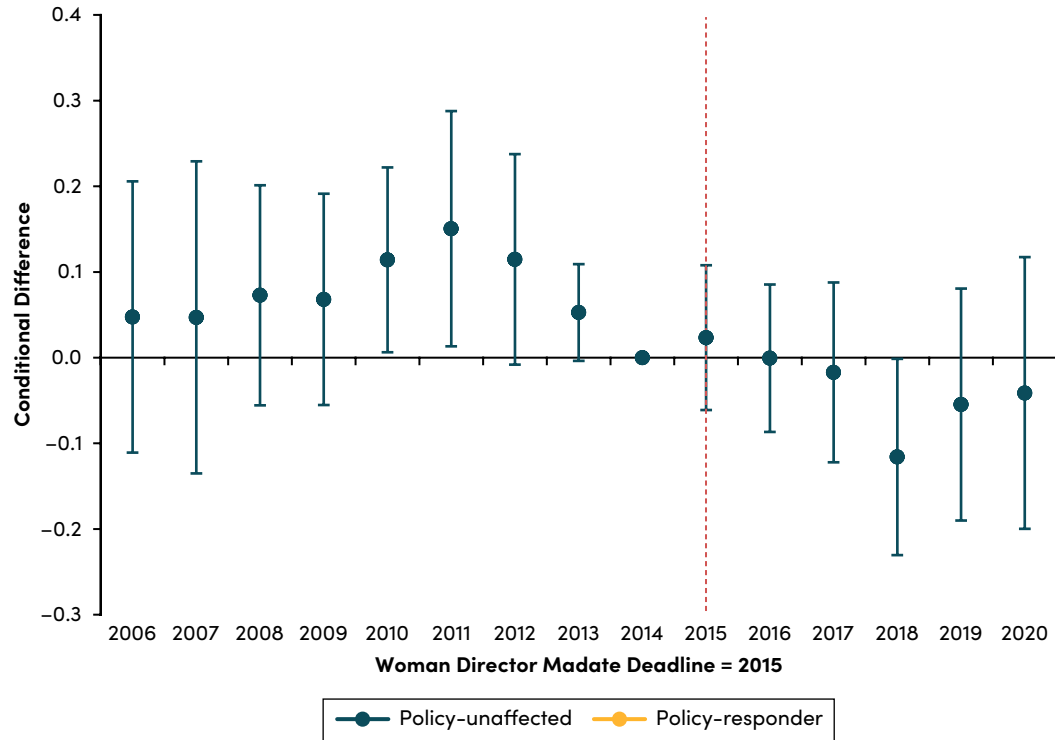
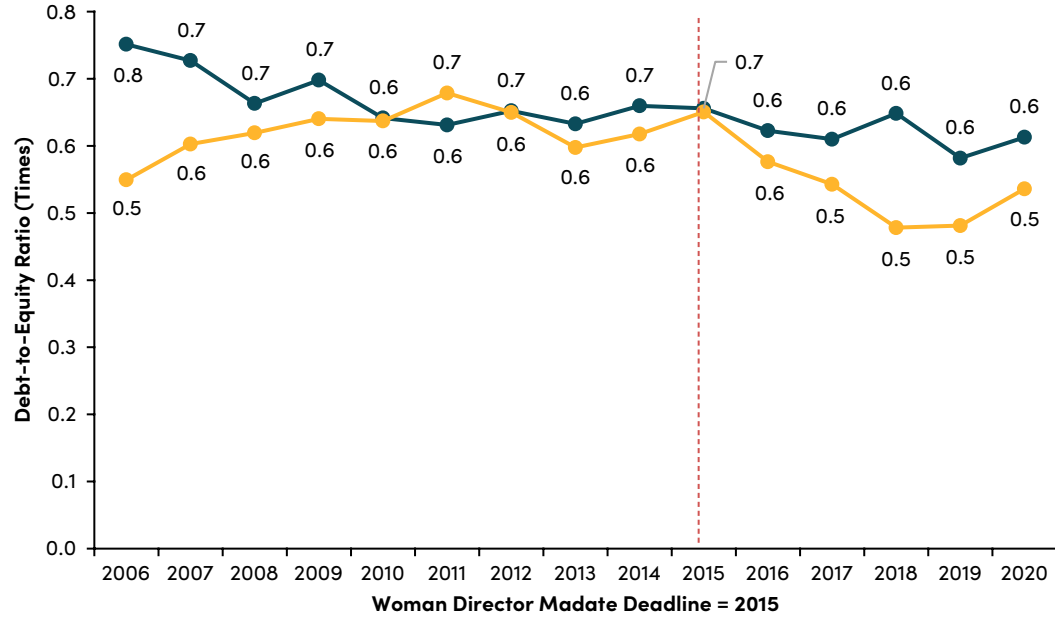


FIGURE 14. (Continued)

Debt-to-Equity Ratio



Notes: All indicators have been transformed using the inverse hyperbolic sine (I.H.S.) function, to reduce the effect of outliers. The bars show the 95% confidence interval.

Source: PRIME and CMIE Database.

As can be seen in Table 2, mid- and large-cap responder firms experienced 163.8 percent higher profits, 35.3 percent higher returns on net worth, and 11 percent lower debt-to-equity ratio. While there are still positive effects (negative for debt-to-equity ratio) for the sample of small-cap firms, these are not statistically significant.⁸

TABLE 2. DDR regression results – sub-sample by firm size

	Profit After Tax (Rs. Million) (2011–12p)		Return on Net Worth (%)		Debt to Equity Ratio (Times)	
	Small- cap	Mid- or Large-cap	Small- cap	Mid- or Large-cap	Small- cap	Mid- or Large-cap
[1 – Responder + (Responder * Post)]	0.0943 (0.267)	1.638*** (0.538)	0.108 (0.137)	0.353* (0.184)	-0.0240 (0.0341)	-0.110** (0.0508)
Traded dummy	Yes	Yes	Yes	Yes	Yes	Yes
Size FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14380	3207	13482	3165	13430	3161
Mean of Dep. Variable	3.354	7.775	1.556	2.857	0.730	0.634

Notes: Standard errors (in parentheses) are clustered at the firm level. Dependent variables are transformed by the inverse hyperbolic sine function. *p < 0.10, **p < 0.05, ***p < 0.01.

Source: Authors' Calculations.

The coefficient refers to the DiD-in-reverse treatment dummy, which is equal to 0 for responder firms and 1 for unaffected firms before policy implementation (before 2015) and 1 for all firms after policy implementation (2015 onwards). The coefficient represents the difference between the average difference in financial performance between unaffected and responder firms after policy implementation (when both groups have the same treatment state) and the average difference between unaffected and responder firms before policy implementation (when responder firms are “not treated”). Therefore, the coefficient shows average “catch up” in financial performance indicators for responder firms, with respect to the unaffected firms following the enforcement of the mandate.

8 We also test if treatment effects differ based on whether firms appoint more than one woman at some point in the post-mandate period, as opposed to consistently having only one woman on their boards to meet mandate requirements. Taking only mid- and large-cap firms in our sample, we find that the treatment effect on profits after tax is stronger for firms that appointed more than one woman. However, we do not find a large difference in the treatment effect on returns on net worth.

4.6 Robustness check – consistent sample of firms

To check the sensitivity of the effect of appointing women on boards to changes in the sample of firms across time, we take a fixed sample of firms for which data is consistently available for all 15 years taken for our analysis (2006 to 2020). This gives us a sample of 567 firms, out of which 306 are unaffected and 261 are responders. The results for this are shown in Table 3.

TABLE 3. DDR regression results – consistent sample

	Profit After Tax (Rs. Million) (2011–12p)	Return on Net Worth (%)	Debt to Equity Ratio (Times)
[1 – Responder + (Responder * Post)]	0.590* (0.336)	0.180 (0.163)	–0.0525 (0.0374)
Traded dummy	Yes	Yes	Yes
Size FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	8490	8189	8182
Mean of Dep. Variable	5.114	2.081	0.692

Notes: Standard errors (in parentheses) are clustered at the firm level. Dependent variables are transformed by the inverse hyperbolic sine function. *p < 0.10, **p < 0.05, ***p < 0.01.

Source: Authors' Calculations.

The coefficient refers to the DiD-in-reverse treatment dummy, which is equal to 0 for responder firms and 1 for unaffected firms before policy implementation (before 2015) and 1 for all firms after policy implementation (2015 onwards). The coefficient represents the difference between the average difference in financial performance between unaffected and responder firms after policy implementation (when both groups have the same treatment state) and the average difference between unaffected and responder firms before policy implementation (when responder firms are “not treated”). Therefore, the coefficient shows average “catch up” in financial performance indicators for responder firms, with respect to the unaffected firms following the enforcement of the mandate.

Within the consistent sample of 567 firms, 142 firms are, on average, not in the small-cap category. Out of these, 108 firms are unaffected and 34 firms are responders. 424 firms are, on average, in the small-cap category, out of which, 198 firms are unaffected and 226 firms are responders. We rerun DDR using a consistent sample of firms, divided by their average size group (either small-cap, or mid- to large-cap). The results for this are shown in Table 4. These results indicate that the qualitative results are the same for the sub-sample of firms for which we have data for all 15 years.

TABLE 4. DDR regression results – consistent sample, sub-sample by firm size

	Profit After Tax (Rs. Million) (2011–12p)		Return on Net Worth (%)		Debt to Equity Ratio (Times)	
	Small- cap	Mid- or Large-cap	Small- cap	Mid- or Large-cap	Small- cap	Mid- or Large-cap
[1 – Responder + (Responder * Post)]	0.0205 (0.369)	2.004*** (0.651)	0.0190 (0.197)	0.463* (0.238)	–0.0332 (0.0467)	–0.116** (0.0569)
Traded dummy	Yes	Yes	Yes	Yes	Yes	Yes
Size FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6360	2130	6091	2098	6088	2094
Mean of Dep. Variable	4.147	8.002	1.800	2.897	0.702	0.663

Notes: Standard errors (in parentheses) are clustered at the firm level. Dependent variables are transformed by the inverse hyperbolic sine function. *p < 0.10, **p < 0.05, ***p < 0.01.

Source: Authors' Calculations.

The coefficient refers to the DiD-in-reverse treatment dummy, which is equal to 0 for responder firms and 1 for unaffected firms before policy implementation (before 2015) and 1 for all firms after policy implementation (2015 onwards). The coefficient represents the difference between the average difference in financial performance between unaffected and responder firms after policy implementation (when both groups have the same treatment state) and the average difference between unaffected and responder firms before policy implementation (when responder firms are “not treated”). Therefore, the coefficient shows average “catch up” in financial performance indicators for responder firms, with respect to the unaffected firms following the enforcement of the mandate.

4.7 Interpretation of results and caveats

While we do not have the data to rigorously test the mechanisms explaining these results, there are a few plausible mechanisms identified in the literature that could explain the positive relationship between women’s representation on board and firm performance.

First, gender balanced boards can partially substitute weak corporate governance (Gul et al., 2011). Adams and Ferreira (2009) find that having female directors on board can improve monitoring and oversight management, thereby strengthening corporate governance. Using descriptive data on attendance of board members in our context, we find suggestive evidence that the gender gaps in board meeting attendance has been going down over time in conjunction with increased presence of women on boards. Moreover, adding women to a previously all-male board has the potential to drastically change culture within the boardroom, leading to better attendance and governance by the male counterparts as well.

Second, if there are discriminatory hiring practices, women of higher quality might get hired, leading to better outcomes. We find that women hired as board members have more years of education as compared to the male board members, although there is a very strong pre-trends in this increase in education.

Third, women may bring different experiences, perspective and network (Biswas et al., 2023) access. This multiplicity of views and better risk management by having balanced decision making may improve the quality of board decisions and lead to better firm practices (Hillman et al., 2007).

There are some limitations to interpreting our results as causal. Although the results suggest a causal impact of the presence of women on boards on firm performance, and previous studies support this evidence, data availability and the methodology used in this paper may introduce some biases to our final estimates. It could be that the policy responder and policy unaffected groups are not randomly selected. We find that policy unaffected firms are more likely to be either mid or large cap, which is also supported by the finding that women are more concentrated in larger firms, possibly due to higher benefits and better resources they offer, which aid women's participation and retention in the labor market. Although we account for firm size, certain unobservable factors, like the ability to weather, economic, or industrial shocks, might bias our estimates.

Another source of bias could stem from the fact that the Companies Act (2013) introduced several new caveats apart from the woman director mandate. Although these affect all firms, they might affect firms differently based on certain characteristics like size. Given that treatment group allocation is not random, there may be certain changes in trends independent of the woman director mandate that may be driving our results.

Finally, some firms may have appointed one woman to their board in anticipation of the Act in either FY 2012–13 or FY 2013–14 (given that a version of the Act was first introduced in FY 2012–13, and the final version was passed in the third quarter of FY 2013–14). This would group them with policy unaffected firms, even though they were responders to the anticipated change in the Company's Act. Furthermore, it is difficult to confidently conclude that the firms that appointed a woman in the post-mandate period would not have done so regardless of the mandate. Since "willingness to appoint a woman" is unobservable, we can only proxy this by the firms' actions in terms of hiring women directors. This could possibly bias our estimates.

5. Women in leadership positions and firm culture

In this section, we focus on the association between the share of women on boards and firm culture, and the circumstances under which this association holds. Previous studies on this topic suggest that firms with greater gender equity in leadership positions are more likely to be more productive, inclusive, and collaborative, and inspire more organizational loyalty. In this context, it is important to consider the prevalent culture of firms before the mandate—if firms are required by law to appoint women on their boards, they may not necessarily possess the culture of inclusivity that allows women to meaningfully participate in decision-making.

We test two main hypotheses. First, we study the association between ratio of women on boards and firm culture and hypothesize that this relationship is positive (i.e. we expect higher ratios of women to be associated with better firm culture). Second, we hypothesize that the association between ratio of women on board and firm culture is stronger if there is evidence that the firm also has women in senior management positions.

5.1 Data description and methodology

We quantify firm culture using employee ratings scraped from AmbitionBox, which is an online platform used by employees to find and rate companies. All the reviews posted are from employees working in offices based in India. Since AmbitionBox was established in 2017, data is only available from 2017 onwards.

We scraped more than 1 million employee reviews posted between 2017 and 2023 (the year 2023 also includes reviews posted in the early months of 2024, until March), covering 2526 firms. Figure 15 shows an example review from AmbitionBox. For each review, we collected the overall rating, and ratings given under individual categories (namely career growth, skill development, company culture, work satisfaction, salary & benefits, job security, and work-life balance). These ratings range between 1 and 5. We also collected the review text under “Likes”, “Dislikes”, and “Work details”. Finally, we collect information on the employee’s job title and the year the review was posted.

FIGURE 15. Example of employee review from ambitionbox

Process Associate in Kolkata
Full Time · Finance Department
★ 4.0 posted on 24 Apr 2024

Likes
There is a good work culture and supportive team as well as great brand value world wide.

Dislikes
Appraisal and benefits are so minimal and there is very few growing opportunity.

Work Details
Work policy: 3 days/week from office
Work days: Monday to Friday (Flexible Timings)
Work related travel: This is a desk job.

Process Associate in Kolkata
Full Time · Finance Department
★ 4.0 posted on 24 Apr 2024

Overall Rating
★ 4.0

Category Ratings

★ 1.0 Career Growth	★ 2.0 Salary & Benefits
★ 4.0 Skill Development	★ 4.0 Job Security
★ 3.0 Company Culture	★ 3.0 Work-Life Balance
★ 3.0 Work Satisfaction	

brand value world wide.
g opportunity.

Source: AmbitionBox.

We combine some groups to calculate work culture ratings (simple average of company culture, work satisfaction, and work-life balance), growth ratings (simple average of career growth and skill development ratings), and security ratings (simple average of salary & benefits and job security ratings).

Using the processed⁹ rich text data collected under likes, dislikes, and overall review, we calculate sentiment polarity scores, which range from -1 to 1.¹⁰ The score is negative if the overall sentiment of the text is negative, positive if the sentiment is positive, and 0 if the sentiment is neutral.

Throughout the analysis, these scores have been weighted by the word length of their respective cleaned texts. The text are “cleaned” to eliminate “stop words” (see footnote 8 below) to prevent bias caused by long texts but with very few substantive words, which tends to increase the occurrence of zeros and results in unreliable average scores.

The correlation between overall weighted sentiment polarity scores for the review texts and the ratings left by employees is positive and significant. This correlation is stronger for sentiment polarity scores calculated for likes more than dislikes. This is because employees who leave low ratings are more likely to describe the negative aspects of their workplaces’ cultures using comparatively neutral language. On the other hand, employees who leave positive ratings are more likely to use language with higher positive sentiment in their reviews.

We study four different measures of employee ratings (average ratings, work culture ratings, growth ratings, and work security ratings), and three different measures for employee sentiment (compound sentiment scores for likes, dislikes, and total review text), giving us seven different measures of firm culture.

Firm culture is more likely to be affected by the ratio of women on board if this ratio has been consistently high. To account for this, and to avoid introducing bias to our estimates by using outliers, we take the average of the share of women on board in the current and last year as the main independent variable. Introducing lag terms in our analysis allows us to account for the possible lasting effects of having more women on board on firm culture.

The average number of reviews per firm rose substantially from 14 in 2017 to 169 in 2023. Since the number of reviews posted per firm was the highest in 2023, and more than 90 percent of firms were

9 We process the review texts by excluding words that can be considered “redundant” in terms of influencing overall sentiment of the text. We call these “stop words”. Natural Language Processing toolkit (NLTK), which is a Python library for Natural Language Processing, considers a list of 179 words “stop words”, which we exclude from our text data. Both the sentiment polarity scores and word length of reviews have been calculated using text that excludes these “stop words”.

10 For this, use the VADER SentimentAnalyzer function, which is included in the Natural Language Toolkit library on Python. This function works with a sentiment lexicon, which is a dictionary containing words or phrases and their respective sentiment ratings, depending on whether they are positive or negative. For our analysis, the cleaned text for each review is first “tokenized”, or broken into individual words. These individual words are then checked against their respective sentiment scores, based on which the overall compound sentiment score of the text is calculated.

covered in 2023, we use 2023 as our year of analysis. This is also done to make sure that we can use lagged averages for gender composition in board while minimizing the effect of COVID-19 on our data. Since the main dependent variable for 2023 will be the average share of women on board in FY 2022–23 and FY 2021–22, we minimize the influence of COVID-19 (FY 2020–21). Therefore, our final sample includes around 400,000 employee reviews.

Each employee review is taken as one observation for the purposes of our study to be able to identify input from managers and other employees separately. As has been observed in surveys worldwide, the seniority of the employees likely changes their perspective on firm culture.

Finally, we control for firm-level characteristics including firm size, industry, and age groups. Instead of size based on market capitalization, we find that size based on the number of employees in the firm explain heterogeneity within ratings and sentiment polarity better. The size is web-scraped from the company profile page on AmbitionBox. The size categories used are: 1–10, 11–50, 51–200, 201–500, 501–1k, 1k–5k, 5k–10k, 10k–50k, 50k–100k, and 100k+ employees. The industry groups are: banking, non-banking finance, construction & real estate, diversified, electricity, manufacturing, mining, and services (other than financial). The firms are divided into age groups based on the year of establishment. The categories used for this are before 1950, between 1951 and 1971, between 1972 and 1985, between 1986 and 1990, and after 1991.

We run simple OLS regressions (including weights for sentiment polarity scores) to quantify the association between firm culture and share of women on board. Since the share of women in top management positions is heavily concentrated at 0, we are unable to separately study the effect of gender inclusive leadership in top management teams. However, we study the simultaneous impact of having women in boards and at least one woman in the top management team, as our second hypothesis.

5.2 Association between ratio of women in boards and firm culture

To check if the association between ratio of women on board and firm culture is positive, we run the following regression (for review r given for firm i , for year 2023):

$$Y_{ir} = \alpha + \delta ratio_i + \gamma manager_{ir} + \beta X_i + \epsilon_{ir} \quad (4)$$

Where Y_{ir} refers to the rating or sentiment score given under review r for firm i , $ratio_i$ refers to the average ratio of women on board in 2022 and 2023 for firm i , $manager_{ir}$ is a dummy variable equal to 1 if review r posted for firm i is from an employee in a managerial position, and X_i refers to firm-level controls (industry, age, and size).

TABLE 5. OLS with firm and review-level characteristics, for 2023

	Average Rating (out of 5)	Average Work Culture Ratings	Average Growth Ratings	Average Work Security Ratings	Compounded Sentiment Score for Likes
Average ratio of women on board over current and last year	0.311 (0.205)	0.230 (0.247)	0.301 (0.223)	0.282 (0.220)	0.0903* (0.0485)
Manager flag	-0.0995*** (0.0165)	-0.164*** (0.0210)	-0.0687*** (0.0217)	0.00659 (0.0181)	-0.0133*** (0.00454)
Size FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Age FE	Yes	Yes	Yes	Yes	Yes
Observations	344681	298016	298016	298016	295789
Mean of Dep. Variable	3.905	3.636	3.452	3.677	0.416

Notes: Standard errors (in parentheses) are clustered at the firm level. Sentiment scores are weighted by the corresponding word length. Since scores for dislikes are largely concentrated on zero (implying neutral sentiment polarity), we have not included results for compounded dislikes and total sentiment scores (which are also affected by the scores for dislikes) in this table. Results for these outcomes are in Appendix II, Table A2. *p < 0.10, **p < 0.05, ***p < 0.01.

Source: Authors' Calculations.

Table 5 shows that the ratio of women on board is positively associated with firm culture, however, this association is only significant at the 10% level for only one of the variables—the sentiment polarity scores for likes. The low significance of this association is not surprising, given that board members do not directly manage a company.

We run the regression described in equation (4) on sub-samples of firms based on whether they have at least one woman in top management. Table 6 shows that across all measures of firm culture, the association between ratio of women on boards and firm culture is higher and significant for firms that currently have at least one woman in their top management team.

TABLE 6. OLS with firm and review-level characteristics, for 2023 – sub-sample based on presence of women in top management

	Average Rating (out of 5)		Average Work Culture Ratings		Average Growth Ratings		Average Work Security Ratings		Compounded Sentiment Score for Likes	
	No Women	At Least One Woman	No Women	At Least One Woman	No Women	At Least One Woman	No Women	At Least One Woman	No Women	At Least One Woman
Average ratio of women on board over current and last year	0.223 (0.298)	0.769** (0.308)	0.190 (0.376)	0.570* (0.328)	0.257 (0.293)	0.934** (0.379)	0.388 (0.311)	0.596* (0.335)	0.139** (0.0697)	0.169** (0.0713)
Manager flag	-0.099*** (0.0196)	-0.082*** (0.0188)	-0.160*** (0.0250)	-0.143*** (0.0215)	-0.071*** (0.0231)	-0.039* (0.0215)	0.014 (0.0176)	0.026 (0.0202)	-0.012*** (0.0042)	-0.006 (0.0059)
Size FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	182514	123679	155608	110066	155608	110066	155608	110066	154506	109155
Mean of Dep. Variable	3.912	3.857	3.628	3.606	3.450	3.405	3.680	3.635	0.413	0.413

Notes: Standard errors (in parentheses) are clustered at the firm level. Sentiment scores are weighted by the corresponding word length. Since scores for dislikes are largely concentrated on zero (implying neutral sentiment polarity), we have not included results for compounded dislikes and total sentiment scores (which are also affected by the scores for dislikes) in this table. Results for these outcomes are in Appendix II, Table A3. *p < 0.10, **p < 0.05, ***p < 0.01.

Source: Authors' Calculations.

6. Conclusion

In this paper we document the status of gender-inclusive corporate leadership and use the woman director mandate in the Companies Act (2013) to study its relationship with firm outcomes, including financial performance and corporate culture in India.

We find that firms, on average, were appointing more women than mandated by the Companies Act (2013). At the same time, newly appointed women were younger, more educated, and independent than their male counterparts and their average number of directorships, the “stretch factor,” increased significantly compared to men. Furthermore, board meeting participation increased for both men and women in the years following the enforcement of the mandate, and consequently the gender gap in meeting attendance decreased. Despite these large changes in both the share of women on boards and average director characteristics, we do not see the positive trends replicated for top management teams (C-Suite). In FY 2022–23, more than half of the NSE-listed firms in our sample did not have even one woman in their top management teams, and less than 10 percent of firms had exactly one woman.

Regarding the impact of the presence of women on boards on financial performance, we find that having at least one woman on board is associated with higher economic performance and financial stability for the larger firms. We observe that although all firms see some impact on financial performance after hiring at least one woman following the mandate, mid-cap and large-cap firms see a more consistent impact for a longer period post-mandate.

We use quantitative measures for firm culture across four different dimensions to study the impact of higher representation of women in leadership on firm culture and employee satisfaction. We find that higher shares of women in board positions are positively associated with employee ratings and sentiment scores, but the relationship is significant only when there is at least one woman in top management (C-suite) positions. These results help us understand possible channels through which gender-equitable boards and top management teams could positively impact firm culture.

7. Policy recommendations

The analysis presented in this paper has several policy implications.

First, the positive impact on firm’s financial performance due to the presence of women in corporate boards, as well as the positive finding on firm culture of hiring more women in top management positions, confirm that there is a clear business case for appointing more women in top positions in the corporate sector.

Second, we find that the Companies Act (2013) was instrumental in increasing the representation of women in boards. By 2023, almost 80 percent of all firms in our sample had more than one woman. Moreover, companies tended to go beyond the mandate, suggesting the favorable impact of the current government's priority to foster women-led development and the positive experience gained by firms. This means that sustained efforts from top policymakers to promote women in leadership positions and in implementing the quota mandate were highly successful and should continue.

Third, the positive spillovers from or the "demonstration effect" of the directorship mandate to hire more women in top management positions did not materialize. In other words, the expectation that adding women to boards would improve gender diversity in other levels of leadership cannot be taken for granted. Given our finding that there is a positive association between the presence of senior women managers and firm culture, there is a lesson for the corporate sector to hire more women in top management positions. Mandating quotas for women in management teams could be considered by policymakers. Alternatively, the government and the business community could promote several human resources practices in the private sector that have been successful in other countries. These include annual gender-bias training for companies, ensuring that there is a gender balance in the interviewing panel, systematically including and seeking out the views of women in management meetings, allowing for flexible working arrangements, and mentorship or sponsorship programs for women.

Fourth, if the problem is on the supply side, we believe it is unlikely due to the absence of highly qualified women, given the rising and substantial number of women graduating in India in higher education, at levels similar to their male counterparts in most fields. If that is the case, it worth exploring why highly educated women do not join the work force or drop out of the work force after a few years. A major factor could be the disproportionate burden that women carry for unpaid care work and household chores. A recent nationwide time-use study from India found that women aged 15–29 allocate 7.4 hours per day to household chores and care work, while similarly aged men only allocate 2.8 hours to these activities (Vikram et al., 2024). This calls for more child and elder care facilities, which could be provided at work or established by the government and private sector. The government could also consider providing subsidies for care facilities to companies that hire and retain more women, and incentivize paternal involvement in child care duties.

Fifth, data on director-level characteristics indicate that women hired on boards have consistently been significantly younger and more educated than their male counterparts. This is good news to the extent that it shatters the myth that the firms have had to compromise on quality because of the enforcement of the Companies Act (2013). At the same time, it points to exploring deeper if there are conscious or unconscious biases against women. Some studies (for example, Ng and Wiesner, 2007) indicate that women must be more qualified than their male counterparts to be considered for the same positions.

Sixth, the finding in our paper that the number of other directorships held by women skyrocketed in the years following the mandate points to whether a serious attempt has been made by companies to expand the pool of potential women directors. If women serve on many boards, it could constrain their capacity to attend multiple board meetings and contribute more productively to board discussions and decisions. Business organizations that represent and advocate the interests of industry could create a roster of qualified women directors and C-Suite managers, which is periodically shared with their member firms.

Finally, empowering women begins at home. The cultural environment at home that fosters an equal treatment of boys and girls has a significant bearing on the attitudes of women themselves when they enter the work force. The influence and views of spouses and in-laws after marriage is also critical. Policies to address cultural and social factors are complex, but there is increasing evidence that signal and support of top policymakers, business leaders, and religious/spiritual leaders can make a significant difference.

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Appendix I

Data sources and sample – gender composition of boards and firm performance

Our firm-level analysis includes firms listed on the National Stock Exchange (NSE), and covers indicators under four broad topics: firm identification, financial performance, leadership, and culture. Indicators for firm-level corporate leadership has been collected from PRIME for 2707 firms. This has been combined with financial performance indicators and market capitalization collected from CMIE to get a firm-year unbalanced panel dataset covering 2580 firms over 18 years (from FY 2005–06 to FY 2022–23). To avoid biasing our results due to COVID-19, we only include the 15-year period in our analysis, until FY 2019–20. Indicators on firm culture have been calculated using employee reviews scraped from AmbitionBox.

Firm leadership indicators include data on directors and top managerial personnel. Details about company directors, including gender, age, education, board meeting attendance, and number of other directorships held (indicating director stretch factor) has been collected for around 33,547 unique directors, for 2707 NSE-listed firms between 2006 and 2023. Data on gender, age, and education is available starting from 2006, while data on number of other directorships held is available from 2013 and share of meetings attended is available from 2015. These indicators have been averaged to create a firm-year unbalanced panel dataset. We have also calculated averages disaggregated by gender to explore if director characteristics differed by gender, and how they differed both before and after the implementation of the Companies Act (2013). Gender composition of top management teams have also been collected for a total of 2332 firms (including both firms listed on the NSE, and some unlisted financial sector firms). This data is available between FY 2011–12 and FY 2023–24. Top management positions include positions C-suite positions like CEO, CFO, COO, etc., and a few other positions including Company Secretary, Compliance Officer etc. Gender composition data within leadership (board and top management) positions are used as the main dependent variable in our analysis.

Firm identification indicators include industry, age of the firm, firm size, and listing information. We use broad the CMIE industry classification, which gives us eight industry groups: Banking, Non-banking finance, Construction & real estate, Diversified, Electricity, Manufacturing, Mining, and Non-financial services. The firms are also divided into five age groups, depending on the business and economic environment of the country at the time of incorporation. The five groups are firms incorporated before 1950, incorporated between 1951 and 1971, incorporated between 1972 and 1985, incorporated between 1986 and 1990, and incorporated after 1991. Firm size is based on its market capitalization value given on the stock exchange where it is listed (or averaged across multiple stock exchange values, if the firm is listed on multiple stock exchanges). These firms are then divided into small-cap, mid-cap, and large-cap based on the rules defined by SEBI (Securities and Exchange Board of India). Two firm-level dummies have also been calculated, indicating whether the firm

is listed on at least one stock exchange, and whether the firm's shares are being actively traded on at least one stock exchange. If a firm is listed on at least one stock exchange, and has not been suspended from this stock exchange, then we classify the firm as "traded".

Financial performance indicators have been collected from CMIE for 2580 NSE-listed firms between FY 2005–06 and FY 2022–23, and include measures for profits after tax, returns on net worth, and debt-to-equity ratio. We focus on these indicators to analyze a firm's profitability (using the profits and returns indicators), and financial stability (using debt-to-equity ratio, which is an indicator for liquidity). Since profits after tax is a currency value, we have adjusted it for inflation using the GDP deflator, indexing on the year FY 2011–12.

The financial performance dataset, merged with board and identification data, forms our final unbalanced panel dataset, including information for 2580 NSE-listed firms between FY 2005–06 and FY 2022–23. This final sample of firms covers a wide range of economic activities. The sample includes 2215 listed firms, and 365 unlisted firms (as of FY 2022–23). There are 2190 non-financial firms, 325 financial non-banking firms, and 65 banking firms. Most (~53.1%) of these firms have been established after liberalization (1991). Within this sample, 191 firms (around 7.4% of the final sample) only have one year available for financial performance. Therefore, these firms are dropped during the econometric analysis. It is also important to note that throughout the rest of this paper, financial years have been used for analyzing the effect of board gender composition on firm outcomes, and the ending year are used to refer to them. Therefore, FY 2014–15 is referred to as 2015 in both the text and figures.

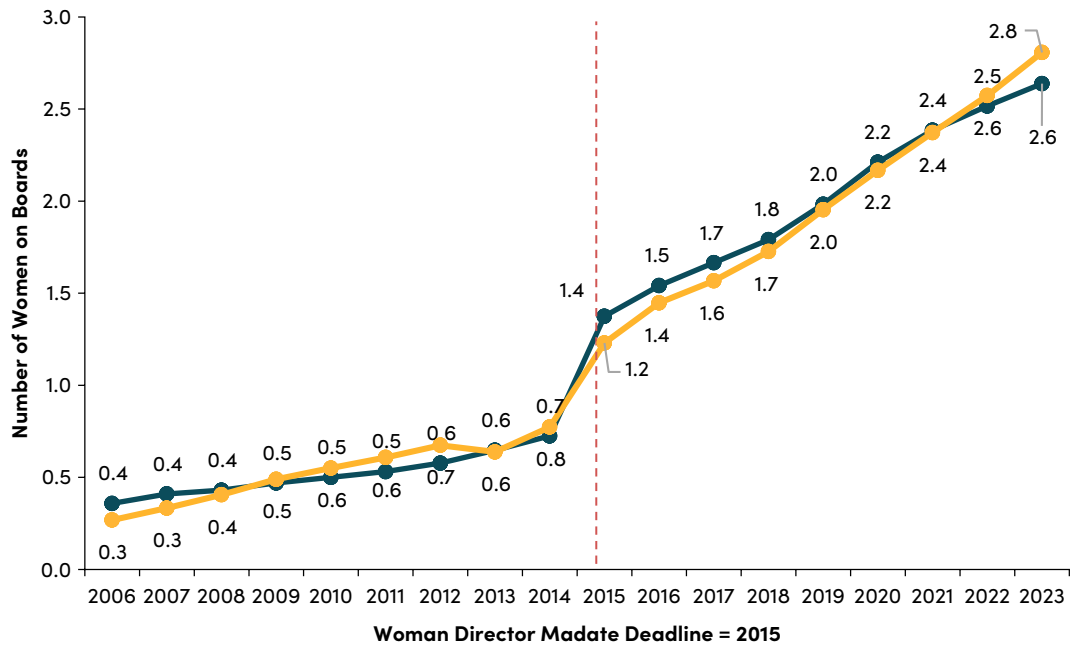
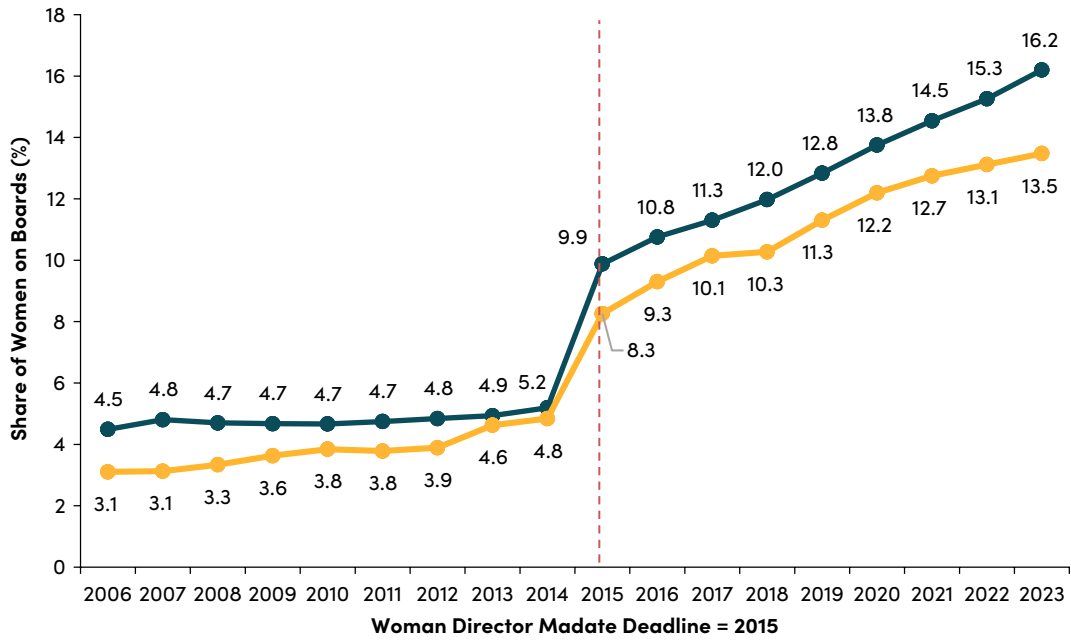
TABLE A1. Firm characteristics by treatment group

	Policy Unaffected	Policy Responders	Total
All firms	707	695	1402
Industry			
Banking	32	6	38
Non-banking finance	79	78	157
Construction & real estate	55	55	110
Diversified	10	22	32
Electricity	10	8	18
Manufacturing	352	385	737
Mining	11	4	15
Services (other than financial)	158	137	295
Age group			
Before 1950	104	68	172
Between 1951 and 1971	88	80	168
Between 1972 and 1985	155	157	312
Between 1986 and 1990	100	127	227
After 1991	260	263	523
Size groups in 2020			
Small-cap	439	547	986
Mid-cap	69	47	116
Large-cap	70	16	86
Missing size group	24	6	30
Total firms in 2020	602	616	1218

Source: PRIME and CMIE Databases.

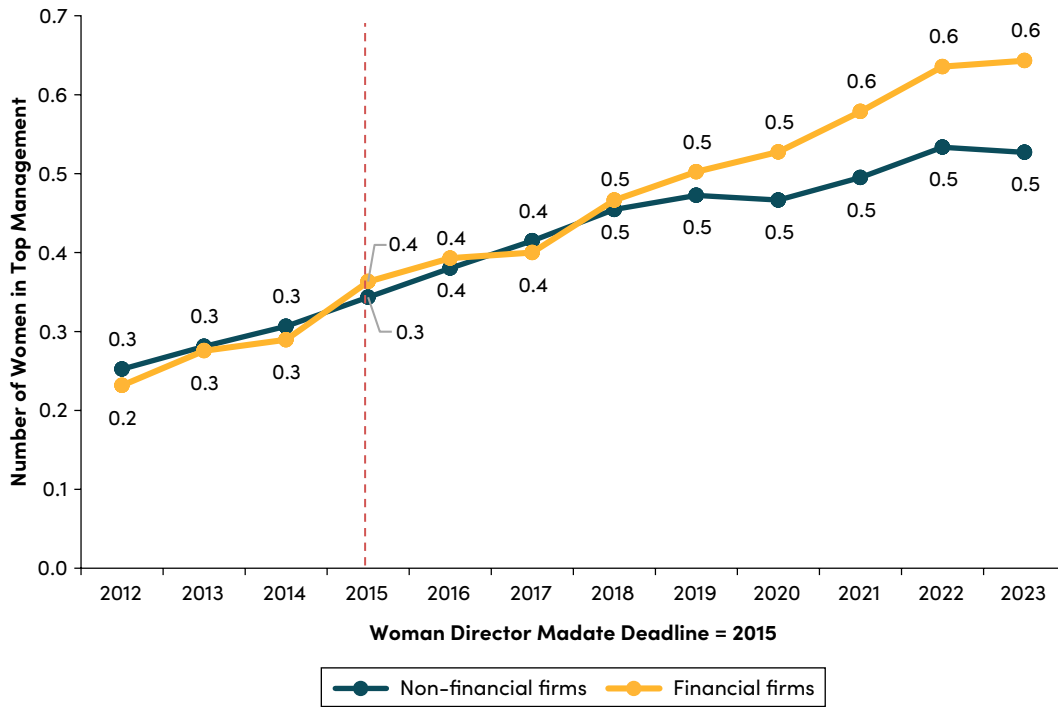
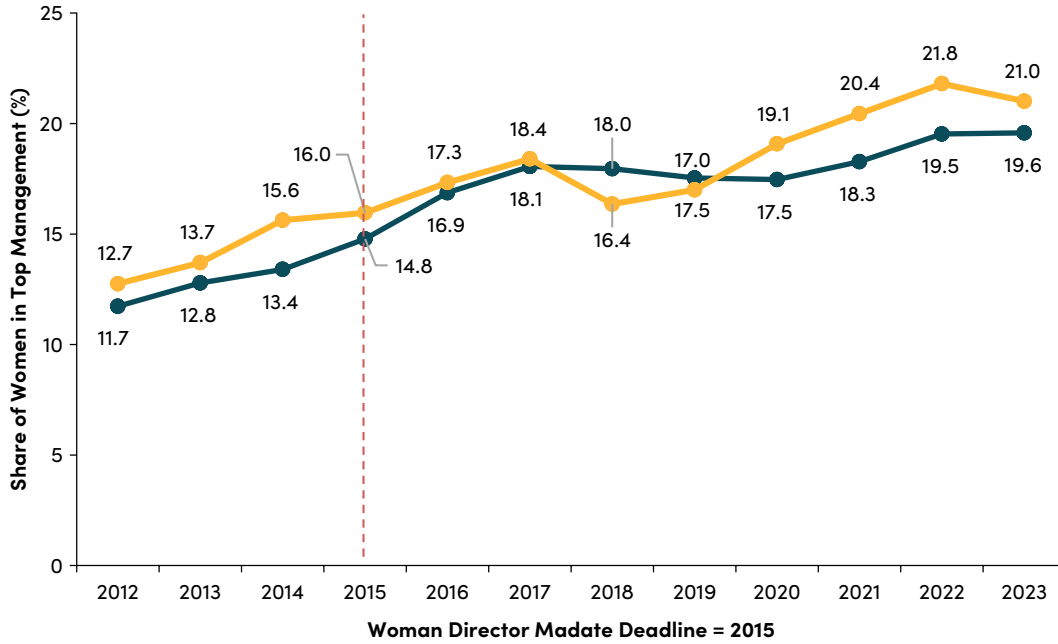
Appendix II

FIGURE A1. Average share and number of women in leadership by industry



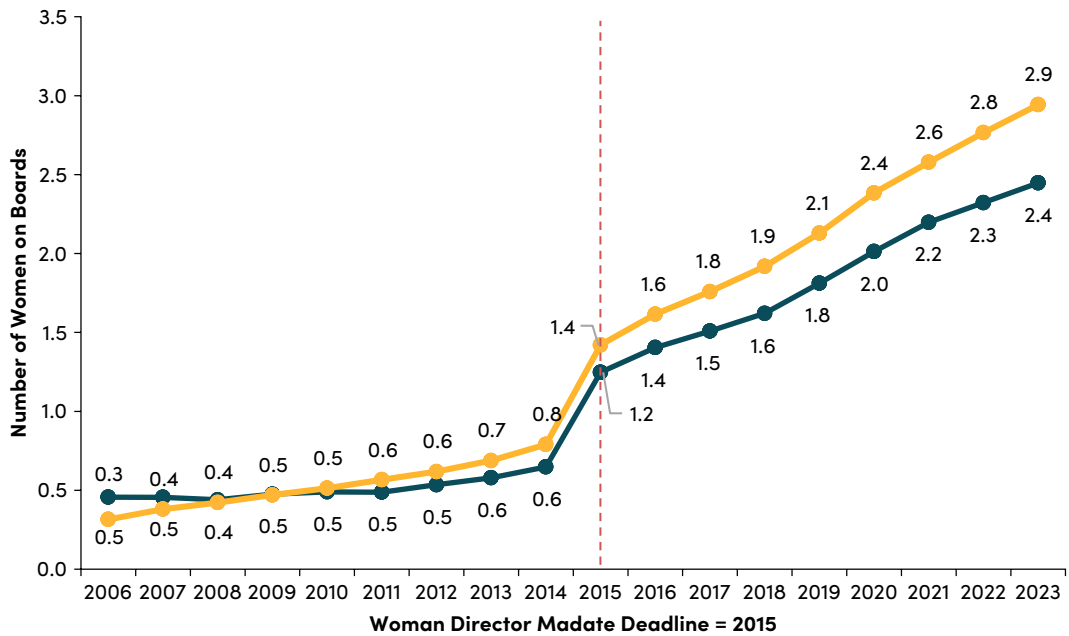
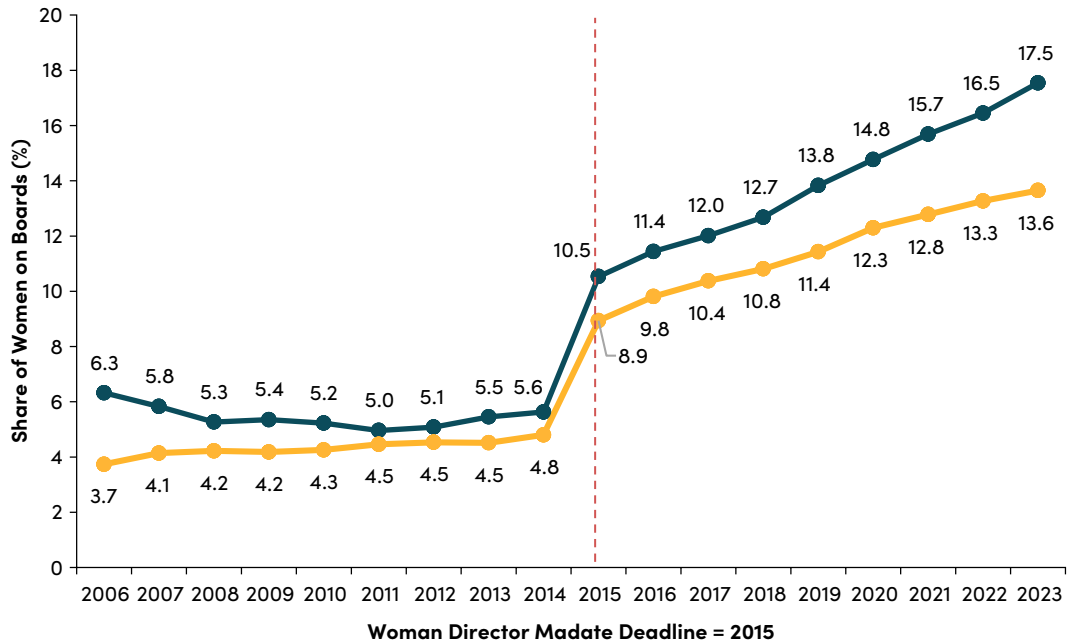
● Non-financial firms ● Financial firms

FIGURE A1. (Continued)



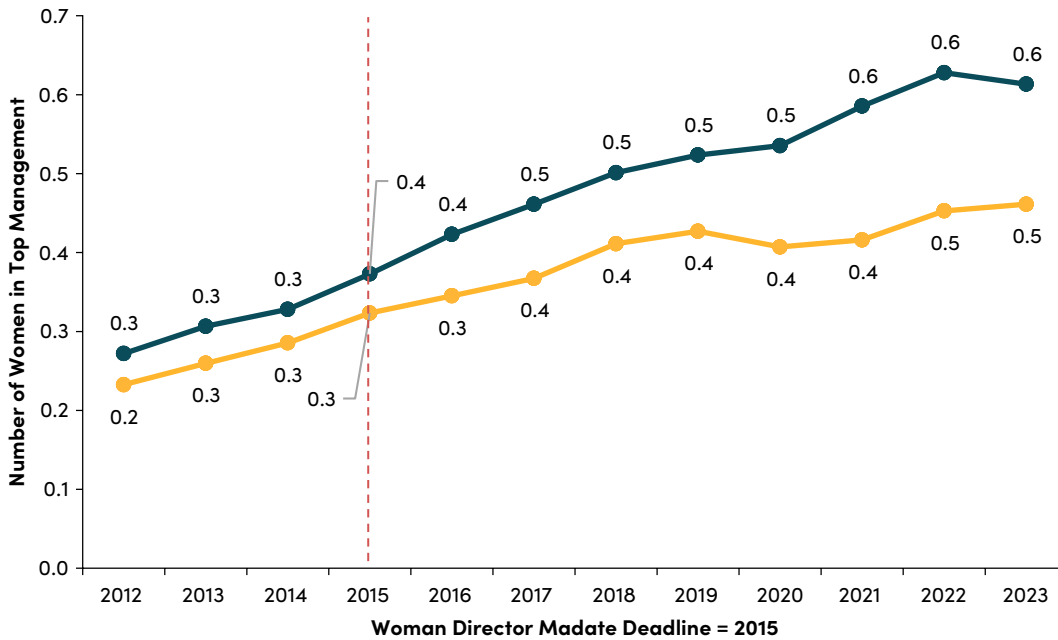
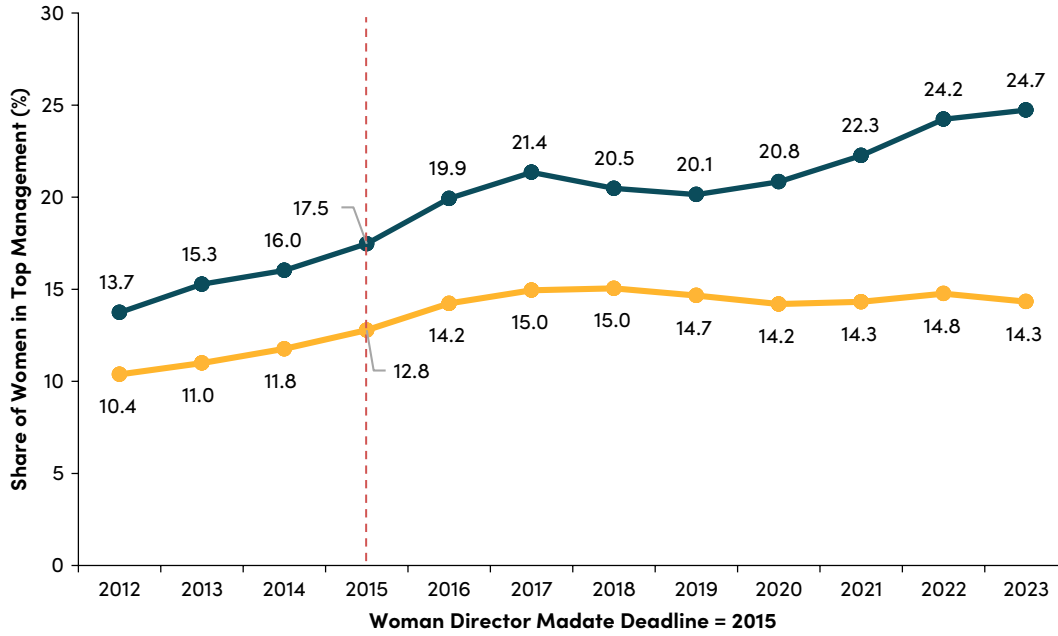
Source: PRIME and CMIE Databases.

FIGURE A2. Average share and number of women in leadership by firm age



● Firm established after 1991
 ● Firm established before 1991

FIGURE A2. (Continued)



● Firm established after 1991 ● Firm established before 1991

Source: PRIME and CMIE Databases.

TABLE A2. OLS with firm and review-level characteristics, for 2023

	Compounded Sentiment Score	Compounded Sentiment Score for Dislikes
Average ratio of women on board over current and last year	0.0734 (0.0636)	0.00260 (0.0406)
Manager flag	-0.0184*** (0.00501)	-0.00550 (0.00337)
Size FE	Yes	Yes
Industry FE	Yes	Yes
Age FE	Yes	Yes
Observations	344681	298016
Mean of Dep. Variable	3.905	3.636

Notes: Standard errors (in parentheses) are clustered at the firm level. Sentiment scores are weighted by the corresponding word length. *p < 0.10, **p < 0.05, ***p < 0.01.

Source: Authors' Calculations.

TABLE A3. OLS with firm and review-level characteristics, for 2023 – sub-sample based on presence of women in top management

	Compounded Sentiment Score		Compounded Sentiment Score for Dislikes	
	No Women	At Least One Woman	No Women	At Least One Woman
Average ratio of women on board over current and last year	0.0854 (0.0973)	0.150* (0.0809)	-0.0246 (0.0629)	-0.0113 (0.0571)
Manager flag	-0.0140*** (0.00484)	-0.0163** (0.00734)	-0.000541 (0.00405)	-0.00840 (0.00607)
Size FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Age FE	Yes	Yes	Yes	Yes
Observations	155570	110038	148566	105416
Mean of Dep. Variable	0.355	0.351	0.0305	0.0284

Notes: Standard errors (in parentheses) are clustered at the firm level. Sentiment scores are weighted by the corresponding word length. *p < 0.10, **p < 0.05, ***p < 0.01.

Source: Authors' Calculations.