

Do gender quotas change attitudes towards female directors?*

S. Lakshmi Naaraayanan
London Business School
lnaaraayanan@london.edu

Kasper Meisner Nielsen
Copenhagen Business School
kmm.fi@cbs.dk

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Abstract :

This study examines whether gender quotas change attitudes towards female directors in India, the largest emerging market to introduce a gender quota. Mandated appointments of female directors lead to a lower firm value resulting from firms expanding their board size. After the reform, firms are 19 percentage points more likely to appoint female independent directors voluntarily. Such appointments are associated with positive stock price reactions. The gender gap in director remuneration decreases from 20% to 5% around the reform. Overall, our results suggest that gender quotas can change the attitude towards female directors, allowing firms to tap into a larger talent pool.

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Underrepresentation of women on corporate boards remains one of the most debated topics in corporate governance in the 21st Century. The debate has intensified with the introduction of gender quotas that address gender disparity on corporate boards. Most notably, the introduction of a 40% gender quota in Norway in 2003 paved the way for recent introductions of gender quotas in Germany, France, Italy, and the United States (i.e., California). Gender quotas have also gained political traction in emerging markets with India mandating at least one female director on corporate boards. Despite a rich literature on gender disparity on corporate boards, evidence on the effect of gender quotas in emerging markets remains scant.

From a corporate governance perspective, the effect of gender quotas in emerging markets remains an open empirical question. In theory, quotas can be an effective tool to deepen and diversify the talent pool of corporate directors by creating opportunities for women. This might be particularly true for emerging markets, where lower corporate governance standards often impede board composition and director quality. However, the supply of high-quality female directors might be limited in emerging markets due to more significant gender disparities in the labor market participation, questioning whether the benefit of gender quotas will materialize.

In this study, we evaluate the introduction of gender quota in India, the largest (emerging) market, to mandate female directors on corporate boards. We ask the question of whether these quotas change attitudes towards female directors. We find that the introduction of the gender quota is associated with an increase of 13 percentage points in the fraction of female directors to total appointments with independent directors driving this increase. After the reform, firms appoint 19 percentage points more women as independent directors. The positive attitude towards women is also reflected in an increase in the appointment rate to important board committees. Female directors are around 6 percentage points more likely to serve on the audit and remuneration committees, although the incidence of subcommittee chairs increase by less than 1 percentage point.

The significant increase in voluntary appointments of female independent directors is driven by firms with greater monitoring and advising needs. We find that opaque firms and firms with complex

operations are more likely to voluntarily appoint females as independent directors. These results are consistent with the perception that female directors are better monitors and advisors. We also find that firms that identify and appoint high-quality female directors, measured by the stock price reaction to past director appointments, are more likely to voluntarily appoint female directors. This evidence suggests that past positive experiences with female candidates are an important driver of the changing attitude towards female directors in India.

Consistent with a change in the attitude towards female directors, we find that the gender pay gap narrows around the reform. Before the reform, female independent directors earn 18% less than male independent directors serving on the same company's board. After the reform, the gap *within* the board declines to 5%. The 13 percentage points reduction in the gender gap in remuneration is significant, both statistically and economically. In further analysis, we document that voluntary appointments of high-quality female directors who receive equal pay after the reform drive the reduction in the gender gap in director remuneration.

Our study contributes to the literature on the effect of gender quotas on corporate boards. Much of the evidence focuses on Norway, the first country to introduce binding gender quotas, and how the stock market reacted to the announcement of the quota (Nygaard, 2011; Ahern and Ditmar, 2012; Matsa and Miller, 2013; and Eckbo, Nygaard, and Thornburn, 2019). Other studies have analysed the effect of gender quotas on firm value in other countries (Comi, Grasseni, Origo, and Pagani, 2016; Ferrari, Ferraro, Profeta, Pronzato, 2016; Hinnerich and Jansson, 2017) and California (Hwang, Shivdasani and Simintzi, 2020; von Meyerinck, Niessen-Ruenzi, Schmid, and Davidoff, 2020).¹ In comparison to these studies, we study the introduction of gender quotas in an emerging market where lower corporate governance standards impede board composition and director quality on boards. We show that the stock market reacts negatively to the mandated appointment of female directors, but that the negative reaction is driven by firms that opt to comply by expanding their board size. We further find that the marginal female director appointed in

¹ Comi, Grasseni, Origo, and Pagani (2016) analyze gender quotas in Belgium, France, Italy, and Spain. Ferrari, Ferraro, Profeta, Pronzato (2016) analyzes gender quota in Italy. Hinnerich and Jansson (2017) analyze gender quotas in Sweden.

response to India's gender quota is of a similar quality as the marginal male director appointed on the same board. This result suggests that the gender quotas in emerging markets potentially have unintended consequences for corporate governance as firms choose to comply with the quota by expanding their board size. Moreover, the positive stock price reaction to the law contrasts evidence from developed economies where supply-side constraints imposed by the mandate have been attributed to the negative stock price reactions among firms that appoint a female director.

Our second contribution is to evaluate the long-term effect of gender quotas on the labour market for corporate directors. We document that firms are 19 percentage points more likely to (voluntarily) appoint females as independent directors after the reform, and female independent directors are around 6 percentage points more likely to serve on key corporate governance committees. The positive attitude towards female directors is also reflected in their remuneration. The gender pay gap within the average board fell from 18% before the reform to 5% after the reform. These findings are consistent with Bertrand, Black, Lleras-Muney, and Jensen (2019), who find a positive effect of the reform in Norway, on the quality of female directors and a subsequent reduction in the gender gap in earnings.² Relative to Bertrand, Black, Lleras-Muney, and Jensen (2019), our contribution is to provide evidence on the long-term effect of gender quotas in an emerging market, where social norms and attitudes towards female directors are substantially different from a developed economy like Norway.

Our study also relates to the emerging literature highlighting the importance of corporate culture and gender equality (Guiso, Sapienza, and Zingales, 2014; Grennan, 2017; Graham, Grennan, Harvey, and Rajgopal, 2017; 2019). Recent evidence by Tate and Yang (2015) find an important externality of female corporate leadership on workplace conditions for women. Specifically, they show that female manager run plants have smaller gender wage gaps suggesting that female leadership cultivates a more female-friendly culture. Duchin, Simutin, and Sosyura (2020) show that managerial preferences and cultural traits affect women's outcomes at firms. Wang and Giannetti (2020) and Lins, Roth, Servaes, and Tamayo (2020) show

² Bertrand, Black, Lleras-Muney, and Jensen (2019) also examine the effect of gender quotas beyond corporate boards but find limited evidence to suggest that the reform had an impact on the career prospects of young women in Norway.

that culture affects how firms react to public attention to gender equality and have implications for firm value. In comparison, our findings provide novel evidence suggesting that policies aimed at gender equality in emerging markets can have a positive long-run impact in shaping corporate boards.

Lastly, our study is related to the broader literature examining the impact of policies aimed at gender equality in emerging markets. Several studies provide evidence that gender quotas have been effective in encouraging female participation in politics (Chattopadhyay and Duflo, 2004) and entrepreneurship (Naaraayanan, 2020). Related, exposure to female leaders in politics improves voter attitudes towards females and that such policies have a role model effect influencing adolescent girls' career aspirations and educational attainment (Beaman, Chattopadhyay, Duflo, Pande, and Topalova (2009); Beaman, Duflo, Pande, and Topalova (2012)). In comparison to these studies, we evaluate the effect of such policies on corporate boards and show that the quota is effective in changing the attitudes towards female directors.

Collectively, our study is the first to evaluate the effect of gender quotas on corporate boards in an emerging market. The first wave of gender quotas was primarily introduced in advanced economies, and much of the empirical evidence points towards substantial costs due to supply constraints in the labor market for directors. As emerging markets generally have lower corporate governance standards, it is crucial to understand the effect of gender quotas in this context. To this end, our study provides the first evidence that is informative for the policymakers and market participants in emerging markets.

The remainder of the paper is organized as follows: Section 1 provides an overview of the gender quota and recent corporate governance reforms in India. Section 2 describes the data and provides summary statistics. Section 3 examines the stock market response to the introduction of the gender quotas and subsequent appointment of female directors. Section 4 focuses on the effect of the reform on female directors' appointment and their subsequent assignment to important governance-related subcommittees. Section 5 examines whether the quota affected the gender gap in director remuneration. Section 6 offers concluding remarks. An Internet Appendix provides many supporting details.

1. Gender quotas and corporate governance reforms in India

In an effort to improve corporate governance standards in India, the Ministry of Corporate Affairs and the securities market regulator, Securities and Exchange Board of India (SEBI), introduced significant reforms. Among others, the regulatory push aimed to improve board diversity and made it mandatory for companies to have at least one female director on board.

Starting in 1999, SEBI appointed the Birla Committee to promote and raise the standards of corporate governance. SEBI introduced recommendations made by the committee through Clause 49 of the Listing Agreement in 2000. Clause 49 focused on the structure of boards and internal controls (e.g. audit committee and disclosure to shareholders) and became effective for all firms on January 1, 2006.³ Alongside these regulatory initiatives, the government proposed three Bills to amend the corporate governance sections of the Companies Act of 1956, but failed to gain support in the Parliament. None of these Bills included a gender quota.

This led to the introduction of a gender quota in the Companies Bill of 2011, which was enacted as the Companies Act, 2013 in August 2013.⁴ All companies were given one year from April 1, 2014 to comply with the Act. Following the enactment of the Companies Act in 2013, SEBI aligned the corporate governance provisions in Clause 49 with the new law. The revised Clause 49 mandated at least one female director, introduced restrictions on director eligibility and remuneration, and mandatory annual performance reviews for independent directors. Moreover, the law introduced stringent personal liability which deterred individuals from serving as independent directors (Naaraayanan and Nielsen, 2020). Except for the appointment of woman directors, all the other changes were effective from October 1, 2014, while the provision regarding appointment of woman director was effective from April 1, 2015.

Moreover, to further improve the corporate governance standards of listed firms in India, SEBI instituted the Kotak Committee on Corporate Governance in June 2017. Based on the recommendations

³ Appendix Figure A1 shows the timeline of corporate governance reforms in India. See Black and Khanna (2007) and Dharmapala and Khanna (2012) for studies of the valuation consequences of the introduction of Clause 49.

⁴ Section 149 of Companies Act, 2013 states that “Provided further that such class or classes of companies as may be prescribed, shall have at least one woman director.”

by the committee and comments from stakeholders, SEBI set out to implement the recommendations. These changes include a reduction in the maximum number of directorships to 7, expanding the eligibility criteria for independent directors, and requiring the largest 500 (2,000) listed firm by market capitalization to have at least one female independent director by April 1, 2019 (April 1, 2020).

In summary, the gender quota is introduced at an active time for corporate governance changes. In the next draft we aim to address whether our findings capture everything happening in the arena of corporate governance during this time period.

2. Data and summary statistics

To analyse whether gender quotas affect the attitude towards female directors we obtain data on the board composition and firm financial for firms listed on the National Stock Exchange (NSE) in India for the period from 2010 to 2020.⁵

Data on board composition are from Indian Boards, a database maintained by Prime database group. This dataset is equivalent to BoardEx for the United States. The data contain information on director characteristics such as age, gender, nationality, education, experience, director type, date of appointment, cessation date, reason for cessations, and director remuneration. For each director, we extract information on educational qualifications and occupation based on their work profile.

Accounting data and financial information are from Prowess, which is the Indian equivalent of CRSP/Compustat. Prowess is maintained by the Center for Monitoring Indian Economy (CMIE), and has been used in a number of prior studies on Indian firms, including Bertrand, Mehta and Mullainathan (2002); Gopalan, Nanda and Seru (2007; 2014); Siegel and Choudhary (2012); Chakrabarti and Subramanian (2016). We use the latest version of Prowess, which is free from survivorship bias, as highlighted by Siegel and Choudhary (2012). The dataset contains information from the income statement and balance sheet, and daily stock prices.

⁵ National Stock Exchange of India Limited (NSE) is the leading stock exchange of India. It is the world's 11th largest stock exchange with a market capitalization of more than US\$2.27 trillion (as of April, 2018).

Prowess also contains information on boards, number of board meetings held, number of board meetings attended by each director. To ensure consistency, we augment Indian Boards' dataset with board information and other variables such as independent/non-independent status, and executive/non-executive status (where available) from Prowess.⁶ We merge the two datasets using NSE ticker symbols.

Our final sample consists of a panel of firms listed on the NSE from 2013 to 2019. This sample corresponds to 6,433 firm-year observations and 60,907 director-year observations. In our analysis "year" refers to financial year as opposed to the calendar year because the financial year in India runs from April 1 to March 31. Thus, we refer to the financial year starting on April 1, 2014 and ending on March 31, 2015 as year 2014-15. All dates are adjusted to reflect financial year rather than the calendar year.

Table 2 presents the descriptive statistics of board characteristics. Panel A reports the number of firms with and without a female director as well as the average number of female directors. In 2013-14 the majority of firms did not have a female director. Interestingly, Panel A also shows that the number of female directors increased to 1.6 by the end of our sample, increasing from 0.5 before the reform.

The introduction of the gender quota in 2014-15 increased the number of unique female directors significantly as shown in Panel B of Table 2. In 2013-14, boards of firms listed on NSE has 394 unique female directors, increasing to more than 1,000 after the reform. This increase occurred at the expense of unique male directors, which decreases from over 6,000 to 5,388 in 2019-20. Most of the increase in female directorships can be attributed to appointments of independent directors.

The overall effect of the introduction of the gender quota is illustrated in Figure 1, which shows the fraction of female directors on Indian boards. The top panel shows that around 5% of directors were female before the reform, increasing to 12% as a result of the reform. Interestingly, Figure 1 also shows a positive time-trend after the reform with the fraction of female directors increasing from 12% to 16%. The increase of 4 percentage points is driven by independent directors as shown in the bottom panel of Figure 1. The fraction of female independent directors has over the sample period increased from by more

⁶ To merge the information across datasets, we perform a time intensive fuzzy matching of director names in both datasets and then retrieve relevant information for each director in any given financial year.

than 15 percentage points, where about half can be attributed to the direct effect of the reform, while the other half is voluntary appointments after the reform. The effect of the reform is starker if one looks at the fraction of females among director appointments in Figure 2. In the year of the reform almost half of all appointments were females. After the reform around 20% of the appointments have been female directors, more than twice the fraction prior to the reform. Again, the bottom panel shows that these changes are driven by independent directors. By the end of the sample close to 1 out of 3 appointments of independent directors were female, compared to less than 1 out of 10 before the reform.

The observed changes to board composition and appointments motivate our research question of whether gender quotas change the attitudes towards female directors, a question that remains unanswered in the context of emerging markets with strong social norms making it difficult for females to join corporate boards.

3. Gender quota and firm value

A natural first question is whether firm values improve or decline due to the gender quotas mandated by the law. Understanding the effect is important as this evidence sheds light that boards affect firm value. First, firms can choose their board structures to maximize firm value, and constraining firms to hire an additional female might lead to a decline in values (Demsetz and Lehn 1985, Ahern and Dittmar, 2012). Moreover, in emerging markets, strong social norms make it difficult for high-quality females to join corporate boards, thus leading to boards engaging in window-dressing by appointing female directors related to board members. Such appointments will exacerbate agency issues and result in lower firm value after the reform. Second, gender quotas may increase the firm value if female directors reduce agency costs of entrenched boards that choose board structures to maximize management's private benefits (Bebchuk and Fried 2005). Additionally, forced diversity itself could increase firm value (Page 2007).⁷ Lastly, if boards are merely window-dressing, such changes will not affect firm value (Helland and Sykuta 2004).

⁷ Alternatively, diverse boards may increase CEO entrenchment, especially if the directors' biases are significant, leading to policy deadlocks more often, resulting in a decline in firm value (Donaldson, Malenko, and Piacentino, 2020). Besides, differences between female and male directors affect firm-value through differences in decision making styles (Matsa and Miller, 2011; Adams and Funk, 2012).

3.1 Stock price reactions to the enactment of the law and other surrounding events

To estimate the impact of the gender quota on firm value, we analyze how the stock market reacts to enacting the law as well as administrative announcements related to the quota. We adopt an event study approach and calculate stock price reactions on the three days around the law and other events surrounding the final compliance date. We report the results of this exercise in panels A to B of Table 3.

In panel A of Table 3, we examine stock price reactions for firms in our sample around the enactment of the law on August 30, 2013. To measure the stock price reaction, we access daily returns from PROWESS for a 3-trading-day period around the enactment. We remove firms without trading volume in estimation window. To calculate the abnormal return, we assume a single-factor model, where beta is estimated using the data from the pre-event window.

In column 1 of Panel A, we find that the stock prices decline by 0.49 percent around the enactment date. This decline is statistically significant at the 1 percent level. To examine whether the negative stock price reaction is related to the gender quota or other contemporaneous corporate governance reform, we split the sample by whether the firm had a female director at the time of the announcement (column 2) or not (column 3). Across both the columns, we find that the same stock price reaction for firms that comply and for firms that do not comply. These results suggest that the introduction of gender quotas in India is not costly for shareholders, and contrasts the evidence from Norway (Ahern and Dittmar, 2012) and the United States (Hwang, Shivdasani, and Simintzi, 2019).

Next, in panel B of Table 3, we examine stock price reactions to the SEBI circular that extended the date to comply with the gender quotas for listed firms. We find that the average firm suffers a loss of 1.5% in value, and this loss in value is similar for both types of firms, with the difference being indistinguishable from zero. Thus, Table 3 shows no difference between firms that comply and firms that are forced to appoint a female director under the quota.

Overall, these results are consistent with the view that the introduction of gender quotas is a non-event, perhaps, because the average male director is of low-quality, and the reform allows firms to tap into a larger talent pool. Note that these results are at odds with studies from the developed economies that

find evidence of a negative stock price reaction to the announcement of the law driven by firms facing a limited director pool.

3.2 Stock price reactions to director appointments

In Table 4, we examine the stock price reactions to director appointments. We focus on firm-specific director appointments because it is likely that the difference between a marginal male director and a marginal female director is small.⁸ To measure the stock price reactions, we follow the same procedure as in the above analysis and estimate the cumulative abnormal returns in a three-day event window around the firm-specific dates of the director appointments' announcements.⁹

Table 4 presents the average stock price reaction to director appointments broken down by gender and director type. Panel A shows that the average stock price reaction to director announcements is negative, but statistically insignificant. This contrasts evidence from the United States where director appointments on average are associated with positive stock returns (Rosenstein and Wyatt, 1990; 1997), for all director types, but is statistically insignificant at the conventional levels. Interestingly, we find almost identical stock price reactions to the appointment of male and female directors, except for independent directors. The difference in the average stock price reaction across male and female director appointments is statistically insignificant across all director types.

Next, in panel B of Table 4, we examine differences in stock price reactions to female directors by their appointment type. We hypothesize that mandated female directors are more likely to lack experience and skills compared to female directors appointed voluntarily by firms outside the regulation (Boyallian, Dasgupta, Homroy, 2019). If this is the case, we expect the stock price reactions to mandatory directors to be negative, while stock price reactions to voluntary directors to be positive. Across all the columns, we find suggestive and consistent evidence with this explanation. Announcements of voluntary appointments

⁸ This approach is similar to Adams, Gray, and Nowland (2012) that studies changes in stock prices around mandatory new director announcements in the context of Australia.

⁹ Throughout the analysis, event windows will refer to trading days around the announcement date, where day 0 is the announcement date or the first trading day after the announcement. Market index is proxied by NIFTY 50 index which is the National Stock Exchange of India's broad-based stock market index for the Indian equity market.

of female directors are associated with positive stock price reactions, while announcements of mandatory appointments are associated with negative stock price reactions. Moreover, we find that the difference is statistically significant across appointment types for the average female director and the average inside female director.

In Appendix Table A3, comparing appointments by financial year, we see a significant increase in appointments after the reform, especially for female directors, which is hardly surprising given that the reform requires firms to have at least one female director on the board. Panels A and B show that the average firm in our sample appointed slightly younger female directors with less prior board experience in response to the reform. In terms of director expertise, we find that half of the directors have an accounting, finance, or law degree in an average firm, with more than 60% of directors having a post-graduate degree. Additionally, in Appendix Table A4, we compare female director characteristics by appointment type and find that mandated female directors have significantly less leadership, lower education, and work experience compared to voluntarily appointed female directors. Overall, the female directors appointed in response to the gender quota are similar in terms of the male director appointments at the average firm.

Lastly, panel C examines investor reaction to the possibility that firms appointing just one female director to satisfy the law might simultaneously adjust their board size. Increasing board size is associated with lower firm value and financial performance (Yermack, 1996). If firms choose to comply with the gender quota by expanding the boards, the stock price reactions might reflect the investor response to this expansion rather than the appointed director. Hence, in panel C of Table 4, we examine stock price reactions to mandatory female director appointments by board size.

We find that the average firm expands its board size to comply with the gender quota, and investors react negatively to such director appointments. The estimates are statistically significant at the 10 percent level. In contrast, mandatory appointments in firms that do not adjust the board size are positive and statistically significant. Lastly, for firms that reduce their board size, investors respond negatively, with the estimates statistically insignificant.

Overall, results are consistent with the view that gender quotas expand the talent pool of directors. Firm value is adversely affected for firms that expand their board size to comply with the quota or appoint inside female directors related to the controlling shareholders. Firm value increases for firms that appoint independent female directors, and more importantly for firms that voluntarily appoint female directors after the reform. We conclude that gender quotas in India do not lead to unqualified directors' appointments, but that the quota has unintended consequences in that some firms respond to the quota by expanding their board size or appoint female directors that are related to controlling shareholders, which is detrimental to firm value.

4. The effect of the gender quota on female director appointments

In this section, we aim to present a comprehensive view of changes in boards' propensity to hire women beyond the requirement of the gender quota. We aim to shed light on whether the quota contributes to changing the attitudes towards female directors and understand which firms that respond to the intension of the reform by voluntarily appoint female directors.

4.1 Female director appointments around the reform

We begin by examining the effects of gender quota on the boards' propensity to appoint female directors. To formally test whether the appointment rates are higher after the reform, we use an Ordinary Least Squares (OLS) regression specification, where the dependent variable is an indicator for a female director.¹⁰ Our main specification focuses on the effect of gender quotas on appointments for post-reform years of 2015-16 and after. To ensure that we indeed capture the changing attitudes towards female directors, we drop the year of the reform, i.e., 2015, to remove the effect of the quota itself.

In keeping with prior literature, we control for firm characteristics (firm size, market to book value, return on assets, stock return, stock price volatility, and ownership of controlling shareholder) and include

¹⁰ Given that the dependent variable is an indicator, we should ideally be using a probit or a logistic regression model. However, we use an OLS model to avoid the incidental parameters problem associated with nonlinear fixed-effects estimation in a panel setting (Neyman and Scott (1948)).

firm fixed effects in the specification. The inclusion of firm fixed effects ensures that time-invariant firm characteristics that might be correlated with director appointments are not driving our results. Table 5 reports the results.

Column 1 of Table 5 shows that the female director appointment rate is 13.4 percentage points higher after introducing gender quotas. This effect is both economically and statistically significant, given the baseline appointment rate of 7.3% for female directors before the reform. Column 2 of Table 5 shows that this effect is stronger for the sample of independent directors. Appointments of female independent directors are 19.1 percentage points more likely after the reform.¹¹ Column 3 of Table 5 shows that the female director appointment rates for inside directors is 7.5 percentage points higher after the reform, and the effect is statistically significant at the 1% level. The increase in female representation on the boards suggests that the law affects attitude towards appointment female directors in general.

4.2 Female director appointments on committees

If gender quotas indeed change attitudes towards female directors, we expect women to become members of important board committees. Figure 3 shows the fraction of firms with female directors serving as chairs or members of audit and remuneration committees, respectively.¹² The top panel shows that around 4.5% of firms had female directors as members of the audit committee before the reform, which increases to 12.8% after the reform. Interestingly, it also shows a positive but modest time-trend after the reform with the fraction of firms where female directors serve as chairs increasing from 0.8% to 1.8%. The bottom panel of Figure 3 shows a similar pattern for the remuneration committee. 6.3% of firms had female directors as members of the remuneration committee before the reform, which increases to 13.5% after the reform. As before, there is a positive but modest time-trend after the reform with the

¹¹ In Appendix Table A2, we show that small firms, outside the top 500 in terms of their year-end market capitalization, respond more strongly in appointing female directors to their boards. These results are consistent with Link, Netter, and Yang (2009), who show that the Sarbanes-Oxley Act imposed higher costs on smaller firms as they increase director pay and overall director costs to comply with the new law.

¹² Note that we observe subcommittee assignments from 2012-13 onwards and hence begin our analyses starting this year.

fraction of firms where female directors serve as chairs increasing from 2.2% to 3%. Thus, Figure 3 offers compelling evidence in favour of changes in attitude towards female directors.

To formally test whether these rates are higher after the reform, we use an Ordinary Least Squares (OLS) regression specification. The dependent variable is the fraction of firms where independent female directors serve as either chair or member of either the audit committee or the remuneration committee.¹³ Table 6 reports the results. Columns 1 and 2 report the results for audit committee while columns 3 and 4 report the results for remuneration committee. As before, all regressions include firm fixed effects to control for time-invariant firm characteristics. In keeping with the prior literature, we also include firm-level time-varying covariates.

Column 1 (column 3) of Table 6 shows that the fraction of firms with female directors as members of audit (remuneration) committee is 5.6 (6.2) percentage points higher after the introduction of gender quotas. This effect is both economically and statistically significant given the baseline fraction of 4.1% (4.9%) before the reform. Column 2 (column 4) shows that the fraction of firms with female directors serving as chairs of audit (remuneration) committee is higher by 0.6 (1.2) percentage points higher post-reform. Thus, the positive attitude towards women is reflected in an increase in the appointment rate to important subcommittees. These findings are consistent with evidence from the US that women are more likely to join monitoring committees (Adams and Ferreira, 2009). Collectively, the evidence bolsters our conjecture that gender quota changed the attitude towards female directors.

4.3 Firm characteristics and changing attitudes to female directors

The increase in the likelihood of female directors' appointments begs the question of which types of firms are changing their attitudes towards female directors. To ascertain this, we relate the post-reform probability of a firm appointing a female director voluntarily to various firm attributes. Specifically, we focus on governance-related characteristics and whether firms have greater monitoring and advising needs.

¹³ Given that the dependent variable is a fraction, we should ideally be using a fractional outcome regression model. However, we use an OLS model to avoid the incidental parameters problem associated with nonlinear fixed-effects estimation in a panel setting (Neyman and Scott, 1948).

Table 7 reports the results. The dependent variable is an indicator variable for whether the firm appointed a female director voluntarily in the post-reform period. Panel A examines the corporate governance characteristics of the firm. Column 1 focuses on board independence and finds that firms with a higher fraction of independent directors on their boards are less likely to voluntarily appoint female directors. The lower likelihood of appointment is consistent with the idea that the demand for monitoring on such boards is limited and that female directors who are perceived to be better monitors and advisors may add little value in such firms.¹⁴ In column 2, we find a positive relationship between firms with attendance problems and the likelihood of voluntarily appointing female directors, consistent with female directors satisfying the greater need for monitoring and advising on such boards.

Interestingly, we do not find a relationship between regulatory non-compliance and appointment probability (column 3). We also find that profitable firms are more likely to appoint female directors voluntarily. Focusing on firms' past experiences with female directors, we find that firms with female directors on their boards before the reform are more likely to appoint female directors after the reform (column 5). Consistently, in column 6, we also find that firms that identify and appoint high-quality female directors, measured by the stock price reaction to past director appointments, are more likely to appoint female directors voluntarily.

Panel B of Table 7 correlates proxies for the demand for monitoring to the appointment likelihood. To identify firms in which independent directors are less likely to be able to detect irregularities, we focus on informationally opaque firms, because independent directors in such firms have inferior information relative to insiders (Raheja, 2005; Harris and Raviv, 2006; Coles, Daniel, and Naveen, 2008; Duchin, Matsusaka, and Ozbas, 2010; Nguyen and Nielsen, 2010). We use three proxies for monitoring costs due to information opacity: High research and development (*Industry R&D share*), high industry growth (*Industry sales growth*) at the two-digit National Industrial Classification (NIC) level, and a high ratio of intangible to total assets (*Asset intangibility*). Indicators for high monitoring costs takes the value one if

¹⁴ Board independence has a positive effect on firm value and operating performance (Knyazeva, Knyazeva, and Masulis, 2013).

R&D expenses, industry sales growth, and intangible assets are above the median, respectively. We also construct three indicators for high monitoring costs due to complexity in the scope of operation for firms with: *multiple plants*, operations in *multiple states*, and *multiple industries*. Consistent with panel A, we find that opaque firms and firms with complex operations are more likely to appoint females as independent directors.

Overall, we find that the significant increase in voluntary appointments of female independent directors is driven by firms with greater monitoring and advising needs. Specifically, we find that opaque firms and firms with complex operations are more likely to appoint females as independent directors. The higher likelihood among such firms is consistent with the perception that female directors are better monitors and advisors. Taken together, these results suggest that past positive experiences with female candidates are an important driver of the changing attitude towards female directors in India.

5. Effect of gender quotas on the gender gap in compensation

If gender quotas change attitudes toward female directors, we expect to see a reduction in the gender pay gap if firms reduce gender disparity. To ensure that we capture compensation for serving on the board, we focus the analysis on independent directors. Figure 5 shows the average remuneration of independent directors for male and female directors. We restrict the sample to firms with a female independent director to ensure that we compare compensation policies within the same firm, rather than across firms. This is important because only a few firms had a female director before the introduction of the gender quota in 2014-15.

Figure 5 shows that the remuneration of male and female directors follows parallel trends, but different levels before the introduction of the gender quota. After the reform, average compensation decreases because the sample expands to all firms, and smaller firms appoint female directors to comply with the gender quota. This pattern is starker for firms appointing female directors voluntarily while mandated female director appointments see a faster convergence. Interestingly, following the reform, the

gender gap in director remuneration narrows, suggesting that the reform did indeed change attitudes towards female directors.

More formally, to explore the effect of the quotas on the gender pay gap in director remuneration, we obtain residuals from the following regressions:

$$y_{ijt} = \alpha_{jt} + \varepsilon_{it} \quad (1)$$

where y_{ijt} is the logarithm of compensation of director i in firm j in year t , and α_{jt} are firm-year fixed effects. Thus, residuals from Equation (1) capture the fraction of compensation that is unexplained by differences in firm policies within a particular financial year. Directors with a positive residual are paid more than an average independent director of the same firm in a given year, while directors with a negative residual are paid less than the average independent director in the same firm in a given year.

Figure 6 plots the residuals on the gender gap in director remuneration with and without controls. Consistent with Figure 5, we find that the gender pay gap is quite stark before the introduction of the gender quota. After the reform, as the average compensation decreases, because more firms appoint female directors to comply with the gender quota, we see that the gender pay gap narrows significantly by the end of the sample. We see a quicker convergence in the gender pay gap once we control director characteristics such as tenure, age, and expertise. The faster convergence with increasing experience suggests that boards penalize female directors for their lack of experience, but once directors gain board experience, the pay gap diminishes. These patterns are starker for firms appointing female directors voluntarily. Table 9 tests whether these gender pay patterns are indeed statistically different.

In Table 9, we use the residuals from Equation (1) as our dependent variable in a specification where we include an indicator for whether the director is a female and an interaction term between the indicator for a female director and an indicator for post-reform years. The sample is restricted to firms with at least one female on their board for the period from 2013 to 2019. We drop the appointment year to avoid confounding the gender gap in compensation with tenure on boards. Besides, the specifications include year-fixed effects and some specifications includes firm-level and director-level controls: tenure, age, and expertise.

On average, females are paid 18 percent less than male directors, an effect that is significant at the 10 percent level. The interaction between the female director indicator and the post-reform indicator is positive but statistically insignificant. One immediate problem with the specification in columns 1 and 2 is that we can only test whether the reform narrowed the gender gap for directors that were appointed before the reform. Therefore, in columns 3 and 4, we restrict the sample to directors that were appointed before the introduction of the gender quota. Again, in this sample, we find that the female directors are paid 18 percent less than male directors of the same firm. Columns 3 and 4 also show that the gender pay gap narrowed after the introduction of the gender quota. The interaction between the post-reform indicator and the female director indicator is positive and statistically significant.

We also formally test whether the gender gap in director remuneration at the start of the sample i.e., 2013 is significantly different from the gender gap in director remuneration at the end of the sample i.e., 2019. We report the p -value of the F -test below each column in Table 9. Across the columns, we find that the gender pay gap is significantly different at conventional levels. Overall, the evidence suggests that the attitude towards female independent directors in India changed after the reform, with the gender pay gap narrowing significantly around the reform.

6. Conclusion

This study examines whether gender quotas affect the attitude towards female directors in an emerging market. We find that the introduction of the gender quota is associated with an increase in the fraction of female directors to total appointments with independent directors driving this increase. The positive attitude towards women is also reflected in an increase in the appointment rate to important subcommittees. Consistent with a change in the attitude towards female directors, we find that the gender pay gap narrows from 18% before the reform to 5% after the reform. Further analysis shows that voluntary appointments of high-quality female directors who receive equal pay after the reform drive the reduction in the gender gap in director remuneration.

These findings collectively advance our understanding of the effect of gender quotas on corporate boards in emerging markets. Our results contrast the evidence from the first wave of gender quotas introduced in advanced economies, which points towards substantial costs due to supply constraints in the directors' labor market. Instead, in emerging markets, we do not find evidence of supply constraints in the labor market affecting female director appointments, with the marginal female director being as qualified as the marginal male directors. Moreover, our results suggest that firms with past positive experiences with female directors are more likely to appoint female directors in the future, and such voluntary appointments are value increasing. To this end, our study provides the first evidence for emerging markets that is informative for the policymakers and market participants.

References

- Adams, R. B., and D. Ferreira. 2009. Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics* 94, 291–309.
- Adams, R.B., and Funk, P. 2012. Beyond the glass ceiling: Does gender matter?" *Management Science* 58, 219-235.
- Adams, R. B., Gray, S., and Newland, J. 2011. Does gender matter in the boardroom? Evidence from the market reaction to mandatory new director announcements. Working paper.
- Ahern, K. R., and Dittmar, A. 2012. The changing of the boards: The impact on firm valuation of mandated female board representation. *Quarterly Journal of Economics* 127, 137–197.
- Beaman, L., Chattopadhyay, R., Duflo, E., Pande, R. and Topalova, P., 2009. Powerful women: does exposure reduce bias?. *Quarterly Journal of Economics*, 124(4), pp.1497-1540.
- Beaman, L., Duflo, E., Pande, R. and Topalova, P., 2012. Female leadership raises aspirations and educational attainment for girls: A policy experiment in India. *Science*, 335(6068), pp.582-586.
- Boyallian, P., S. Dasgupta, and S. Homroy. 2019. Supply and demand side determinants of board gender imbalance: the U.S. evidence. Working Paper.
- Bebchuk, L.A. and Fried, J.M., 2005. Pay without performance: Overview of the issues. *Journal of Applied Corporate Finance*, 17(4), pp.8-23.
- Bertrand, M., Black, S. E., Jensen, S. and Lleras-Muney, A. 2018. Breaking the glass ceiling? The effect of board quotas on female labor market outcomes in Norway. *Review of Economic Studies* 86, 191-239.
- Chattopadhyay, R. and Duflo E. 2004. Women as policy makers: Evidence from a randomized policy experiment in India. *Econometrica* 72, 1409–1443.
- Coles, J., Daniel, N., and Naveen, L., 2008. Boards: does one size fit all? *Journal of Financial Economics* 87, 329–356.
- Coles, J., Daniel, N., and Naveen, L., 2014. Co-opted boards. *Review of Financial Studies* 27, 1751-1796.
- Coles, J., and Hoi, S., 2003. New evidence on the market for directors: Board membership and Pennsylvania Senate Bill1310. *Journal of Finance* 58, 197-230.
- Comi, S., Grasseni, M., Origo, F., and Pagani, L. 2019. Where women make a difference: Gender quotas and firms' performance in three European countries. *ILR Review* 73, 768-793.
- Demsetz, H. and Lehn, K., 1985. The structure of corporate ownership: Causes and consequences. *Journal of Political Economy*, 93(6), pp.1155-1177.
- Donaldson, J.R., Malenko, N. and Piacentino, G., 2020. Deadlock on the Board. *Review of Financial Studies*, Forthcoming
- Duchin, R., Matsusaka, J., and Ozbas, O., 2010. When are outside directors effective?. *Journal of Financial Economics* 96, 195-214.
- Duchin, R., Simutin, M. and Sosyura, D., 2020. The Origins and Real Effects of the Gender Gap: Evidence from CEOs' Formative Years. *Review of Financial Studies*, Forthcoming.
- Eckbo, B.E., Nygaard, K., and Thorburn K. 2019. Board gender-balancing and firm value. ECGI Working Paper.
- Ferrari G., Ferraro, V., Profeta, P., and Pronzato, C. 2016. Gender quotas: Challenging the boards, performance, and the stock market. Working Paper.
- Giannetti, M. and Wang, T., 2020. Public Attention to Gender Equality and the Demand for Female Directors. Working Paper.

- Graham, J.R., Harvey, C.R., Grennan, J. and Rajgopal, S., 2017. Corporate culture: Evidence from the field (No. w23255). National Bureau of Economic Research. Working Paper.
- Graham, J.R., Grennan, J., Harvey, C.R. and Rajgopal, S., 2016. Corporate culture: The interview evidence. Working Paper.
- Grennan, J., 2019. A corporate culture channel: How increased shareholder governance reduces firm value. Working Paper.
- Grundfest, J. 2018. Mandating Gender Diversity in the Corporate Boardroom: The Inevitable Failure of California's SB 826. Stanford Public Law Working Paper.
- Guiso, L., Sapienza, P. and Zingales, L., 2006. Does culture affect economic outcomes?. *Journal of Economic Perspectives*, 20(2), pp.23-48.
- Helland, E. and Sykuta, M., 2004. Regulation and the evolution of corporate boards: Monitoring, advising, or window dressing?. *Journal of Law and Economics*, 47(1), pp.167-193.
- Hinnerich, B.T. and Jansson, J. 2017. Gender quotas in the board room and firm performance: Evidence from a credible threat in Sweden. Working paper.
- Hwang, S., Shivdasani, A., and Simintzi, E., 2020. Mandating Women on Boards: Evidence from the United States. Working Paper.
- Knyazeva, A., D. Knyazeva, and R. W. Masulis. 2013. The supply of corporate directors and board independence. *Review of Financial Studies* 26, 1561–1605.
- Linck, J. S., J. M. Netter, and T. Yang. 2008. The effects and unintended consequences of the Sarbanes-Oxley Act on the supply and demand for directors. *Review of Financial Studies* 22, 3287–3328.
- Lins, K.V., Roth, L., Servaes, H. and Tamayo, A., 2020. Gender, Culture, and Firm Value: Evidence from the Harvey Weinstein Scandal and the# MeToo Movement. Working Paper.
- Matsa, D., and Miller, A. 2011. Chipping away at the glass ceiling: Gender spillovers in corporate leadership. *American Economic Review : Papers and Proceedings* 101, 635-639.
- Matsa, D. and Miller, A. 2013. A female style in corporate leadership? Evidence from quotas. *American Economic Journal: Applied Economics* 5, 136-169.
- von Meyerinck, F., Niessen-Ruenzi, A., Schmid, M., and Solomon, S.D. 2020. As California goes, so goes the nation? Board gender quotas and the legislation of non-economic values. Working paper.
- Naaraayanan, S., and Nielsen, K., 2020. Does personal liability deter individuals from serving as independent directors?. *Journal of Financial Economics*, Forthcoming.
- Neyman, J. and Scott, E.L., 1948. Consistent estimates based on partially consistent observations. *Econometrica*, pp.1-32.
- Nguyen, B., and Nielsen, K., 2010. The value of independent directors: Evidence from sudden deaths. *Journal of Financial Economics* 98, 550-567.
- Nygaard, K. 2011. Forced board changes: Evidence from Norway. Working paper, Norwegian School of Economics and Business Administration.
- Page, S.E., 2008. *The difference: How the power of diversity creates better groups, firms, schools, and societies-new edition*. Princeton University Press.
- Raheja, C., 2005. Determinants of board size and composition: A theory of corporate boards. *Journal of Financial and Quantitative Analysis* 40, 283-306.
- Rosenstein, S., and Wyatt, J., 1990. Outside directors, board independence, and shareholder wealth. *Journal of Financial Economics* 26, 175–191.

- Rosenstein, S., and Wyatt, J., 1997. Inside directors, board effectiveness, and shareholder wealth. *Journal of Financial Economics* 44, 229–250.
- Yermack, D. 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics* 40, 185-211.

Table 1: Gender quotas on corporate boards around the world

This table reports the chronology of legislation introducing gender quotas on corporate boards around the world. The table includes countries that have introduced regulation through legislation, rather than through recommendations in corporate governance codes. We report the year of compliance, whether the quota is binding, the quota and notes with specific details for the quota. Quotas either require a minimum number of directors of each gender or that minimum fraction of each gender is represented among the board of directors.

Country	Compliance year	Binding	Quota	Notes
Israel	1999	Yes	At least 1 woman	
Norway	2008	Yes	40%	
Kenya	2010	No	33%	
Iceland	2013	Yes	40%	
India	2014-15	Yes	At least 1 woman	
Italy	2015	Yes	33%	
Netherlands	2015	No	30%	Expired in 2016. Continued as soft law
Spain	2015	No	40%	
Germany	2016	Yes	30%	
Belgium	2017	Yes	33%	
France	2017	Yes	40%	
Austria	2018	Yes	30%	
Pakistan	2018	Yes	At least 1 woman	Not later than expiry of its current term or within the next one year from the effective date of the 2017 code
India	2019-20	Yes	At least 1 female independent director	Applicable to Top 500 firms by market capitalization in 2019-20, and to Top 1000 firms by market capitalization in 2020-21.
Portugal	2020	Yes	33%	
United States				
- California	2020	Yes	At least 1 woman	After 1 year: 2 women on boards with 5 directors. 3 women on boards with 6 or more directors.
- Illinois	2021		At least 1 woman	After 2 years: 2 women on boards with 5 directors. 3 women on boards with 6 or more directors.
- Massachusetts	2021	Yes	At least 1 woman	After 1 year: 2 women on boards with 5 directors. 3 women on boards with 6 or more directors.
- New Jersey	2021		At least 1 woman	After 2 years: 2 women on boards with 5 directors. 3 women on boards with 6 or more directors.
- Washington	2021		At least 1 woman	After 2 years: 3 women on boards with 10 to 19 directors. 30% women on boards with 20+ directors.

Table 2: Firm and director characteristics by year

We report descriptive statistics: mean and standard deviation for our sample of NSE-listed firms from April 1, 2009 to March 31, 2020. Panel A reports the following firm characteristics: *Number of firms*, *Number of firms with a female*, *Number of firms without a female*, and *Fraction of female directors*. Panel B reports the following director characteristics: *Number of unique directors*, *Number of unique female directors*, *Number of unique male directors*, *Number of female directors*, *Number of female independent directors*, and *Number of female inside directors*.

	Financial year											
	All	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<i>Panel A: Firm characteristics</i>												
Number of firms	10,084	919	919	919	919	919	919	919	919	919	919	894
Number of firms with a female	7,035	302	319	333	340	378	857	903	905	908	908	882
Number of firms without a female	3,049	617	600	586	579	541	62	16	14	11	11	12
Fraction of female directors	0.9	0.4	0.4	0.5	0.5	0.5	1.1	1.2	1.3	1.3	1.4	1.6
<i>Panel B: Director characteristics</i>												
Number of unique directors	72,862	6,409	6,504	6,588	6,535	6,589	6,988	6,741	6,704	6,674	6,721	6,409
Number of unique female directors	7,373	316	327	347	351	394	805	876	932	973	1,031	1,021
Number of unique male directors	65,489	6,093	6,177	6,241	6,184	6,195	6,183	5,865	5,772	5,701	5,690	5,388
Number of female directors	9,389	382	396	423	442	495	1,019	1,117	1,172	1,227	1,324	1,392
Number of female independent directors	4,957	77	76	84	164	210	561	640	673	732	816	924
Number of female inside directors	4,116	212	222	222	277	284	456	476	499	495	507	466

Table 3: Stock price reactions to the events around the introduction of gender quotas

This table shows stock price reactions to the events around the introduction of gender quotas through the enactment of the Companies Act, 2013. Specifically, it reports the mean cumulative abnormal returns (CAR) using an event window from one day before to one day after the announcement. Panel A examines the CARs around the announcement of Companies Act, 2013 while panel B examines the CARs around the SEBI circular on extension. Across both panels, column 1 reports the average CAR for all firms and column 2 (column 3) report the average CAR for firms who had at least one female director on their board at the time of the announcement. The column titled, *Difference*, reports the difference in the average CARs for these two types of firms. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Announcement of the law	All	Female	No female	Difference
<i>Event date: 30 August, 2013</i>	(1)	(2)	(3)	(3) - (2)
	-0.494***	-0.489**	-0.498**	0.009
	(0.158)	(0.245)	(0.207)	(0.321)
N	727	309	418	727

Panel B: SEBI circular on extension	All	Female	No female	Difference
<i>Event date: 15 September, 2014</i>	(1)	(2)	(3)	(3) - (2)
	-1.469***	-1.510***	-1.406***	-0.104
	(0.184)	(0.215)	(0.331)	(0.394)
N	769	463	306	769

Table 4: Stock price reactions to director appointments

This table reports the mean cumulative abnormal returns (CAR) using an event window from one day before to one day after the announcement of a director appointment. Panel A reports the CARs by director gender, panel B reports CARs for female director appointments by the appointment type, and panel C reports CARs for female directors appointed to satisfy the gender quota mandate by whether the appointing firms alter their board size. Across the three panels, columns 1, 3, and 5 (columns 2, 4, and 6) report the average CAR (number of observations) for all directors, independent directors, and inside directors, respectively. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: By gender

	All		Independent		Inside	
	Average	N	Average	N	Average	N
	(1)	(2)	(3)	(4)	(5)	(6)
Female director	-0.036 (0.143)	1,362	-0.018 (0.179)	869	-0.067 (0.218)	493
Male director	-0.032 (0.076)	6,222	-0.250** (0.118)	2,650	0.129 (0.090)	3,572
Difference (Female-Male)	-0.004 (0.150)	7,584	0.232 (0.200)	3,519	-0.197 (0.224)	4,065

Panel B: Female by appointment type

	All		Independent		Inside	
	Average	N	Average	N	Average	N
	(1)	(2)	(3)	(4)	(5)	(6)
Voluntary	0.307 (0.220)	499	0.181 (0.316)	159	0.453 (0.282)	231
Mandatory	-0.234 (0.182)	863	-0.107 (0.216)	601	-0.526 (0.323)	262
Difference (Voluntary-Mandatory)	0.541* (0.283)	1,362	0.288 (0.381)	869	0.979** (0.429)	493

Panel C: Mandatory female by board size

	All		Independent		Inside	
	Average	N	Average	N	Average	N
	(1)	(2)	(3)	(4)	(5)	(6)
Expands board size	-0.427* (0.223)	590	-0.424* (0.254)	417	-0.436 (0.431)	173
Same board size	0.469 (0.418)	137	1.126** (0.503)	95	-1.018 (0.716)	42
Reduces board size	-0.106 (0.455)	136	0.060 (0.642)	89	-0.419 (0.605)	47

Table 5: Effect of the gender quotas on female director appointments

This table presents the impact of the reform requiring firms to have female director on the appointment rates of females for the period starting from 2010 to 2020. We drop the financial year 2015 to avoid the mechanical relationship between the reform and female director appointments. The dependent variable is an indicator for a female director. Column 1 includes all directors, column 2 focuses on independent directors, and column 3 focuses on inside directors. *Post reform* is an indicator equal to one for financial years 2014-15 and after as the gender quotas became effective in the financial year 2014-2015. All the regressions include the following control variables: *Firm size* is the log of book value of assets. *Market-to-book value* is the market-to-book ratio of assets, defined as market value of equity plus book value of debt over book value of assets. *Return on assets* is the ratio of profit after tax to book value of assets. *Stock return* is the annualized return and *Stock return volatility* is the annualized standard deviation of the firm's daily stock returns during the year. In addition, we also include the *Ownership* of the controlling shareholder as a control variable. All controls are lagged by one year. We use ordinary least squares (OLS) regression specification to estimate the coefficients. All regressions include firm fixed effects and standard errors are clustered at the firm-level. Standard errors are in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

	All	Independent	Inside
	(1)	(2)	(3)
Post reform	0.134*** (0.011)	0.191*** (0.022)	0.075*** (0.015)
Return on assets _{t-1}	-0.047 (0.041)	-0.119 (0.081)	-0.037 (0.044)
Firm size _{t-1}	-0.009 (0.006)	-0.008 (0.012)	-0.005 (0.009)
Market-to-book value _{t-1}	0.001 (0.004)	-0.002 (0.004)	0.007 (0.009)
Stock return _{t-1}	-0.001 (0.006)	-0.007 (0.012)	-0.005 (0.009)
Stock return volatility _{t-1}	-0.001 (0.003)	-0.012 (0.011)	0.014 (0.012)
Fraction of independent directors on the board _{t-1}	0.001 (0.025)	0.020 (0.051)	0.024 (0.040)
Proportion of shares held by promoters _{t-1}	0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Firm fixed effects	Yes	Yes	Yes
Adjusted R-squared	0.128	0.246	0.269
Observations	8,508	3,816	3,960

Table 6: Effect of the gender quotas on female committee appointments

This table presents the impact of gender quotas on female director appointments on audit and remuneration committee by the position held starting from 2013 to 2020. The dependent variable is the fraction of firms where female directors serve as either chair or member of either the audit committee (columns 1 and 2) or the remuneration committee (columns 3 and 4). *Post reform* is an indicator equal to one for financial years 2014-15 and after as the gender quotas became effective in the financial year 2014-2015. All the regressions include the following control variables: *Firm size* is the log of book value of assets. *Market-to-book value* is the market-to-book ratio of assets, defined as market value of equity plus book value of debt over book value of assets. *Return on assets* is the ratio of profit after tax to book value of assets. *Stock return* is the annualized return and *Stock return volatility* is the annualized standard deviation of the firm's daily stock returns during the year. In addition, we also include the *Ownership* of the controlling shareholder as a control variable. All controls are lagged by one year. We use ordinary least squares (OLS) regression specification to estimate the coefficients. All regressions include firm fixed effects and standard errors are clustered at the firm-level. Standard errors are in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

	Audit committee		Remuneration committee	
	Member (1)	Chair (2)	Member (3)	Chair (4)
Post reform	5.578*** (0.688)	0.607* (0.310)	6.232*** (0.817)	1.260*** (0.480)
Return on assets _{t-1}	-1.643 (2.049)	-1.119 (1.378)	-0.105 (2.465)	0.057 (1.500)
Firm size _{t-1}	1.061 (0.746)	0.004 (0.300)	1.124 (0.756)	0.375 (0.404)
Market-to-book value _{t-1}	0.016 (0.143)	-0.062 (0.092)	0.627** (0.279)	0.118 (0.089)
Stock return _{t-1}	0.515* (0.304)	-0.051 (0.122)	0.686* (0.380)	-0.165 (0.179)
Stock return volatility _{t-1}	-0.164 (0.420)	-0.160 (0.188)	-0.611 (0.524)	-0.226 (0.280)
Fraction of independent directors on the board _{t-1}	2.257 (2.203)	-0.103 (1.310)	-4.231 (2.684)	-1.265 (1.688)
Proportion of shares held by promoters _{t-1}	-0.085* (0.051)	-0.048 (0.030)	-0.068 (0.068)	-0.004 (0.040)
Firm fixed effects	Yes	Yes	Yes	Yes
Adjusted R-squared	0.587	0.548	0.617	0.570
Observations	5,103	5,103	4,629	4,629

Table 7: Gender quotas, voluntary female appointments, and firm characteristics

This table presents the examines the characteristics of firms that appoint female voluntarily outside the regulation. The dependent variable is an indicator variable for whether the firm appointed a female director voluntarily or not. Panel A examines corporate governance and other characteristics. Column 1 uses fraction of independent directors on the board, column 2 focuses on below-median firm-level attendance rates, and column 3 focuses on regulatory non-compliance with SEBI's listing agreement in any of the past 5 financial years before 2015. Column 4 uses return on assets as a measure of profitability. *Return on assets* is the ratio of profit after tax to book value of assets. Column 5 focuses on if the firm had a female director in the immediate year before the effective compliance date while column 6 examines the relation with stock price reaction to first female director appointment. Panel B examines the proxies for the demand for monitoring. Column 1 focuses on, *Industry R&D share*, which is an indicator equal to one if the firm's research and development (R&D) expenses are above the median compared to industry share of total research and development (R&D) expenses. Column 2 focuses on, *Industry sales growth*, which is an indicator equal to one if the two-digit NIC industry-level growth is above median. Column 3 focuses on, *Asset intangibility*, which is an indicator equal to one if the firm has above median ratio of intangible to total assets. Column 4 focuses on, *Multiple plants*, which is an indicator equal to one if the firm has above median number of operational plants within India. Column 5 focuses on, *Multiple states*, which is an indicator variable equal to one if the firm has operations in above median number of states. Column 6 focuses on, *Multiple industries*, which is an indicator variable equal to one if the firm has operations in above median number of industries measured at the two-digit NIC industry-level. All regressions include year fixed effects. The sample period starts from 2015 until 2020. We use ordinary least squares (OLS) regression specification to estimate the coefficients. All regressions include year fixed effects using standard errors clustered at the firm-level. Standard errors are in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Governance characteristics

Variable definitions	Governance characteristics			Others		
	Fraction of independent directors on the board	Low board attendance	Regulatory non-compliance	Profitability	Voluntary in 2014	First female stock price reaction (voluntary)
	(1)	(2)	(3)	(4)	(5)	(6)
Governance $t-1$	-0.272*** (0.075)	0.034** (0.016)	-0.011 (0.021)	0.154*** (0.041)	0.283*** (0.018)	0.699*** (0.014)
Constant	0.455*** (0.041)	0.294*** (0.014)	0.316*** (0.013)	0.309*** (0.010)	0.176*** (0.010)	0.274*** (0.010)
Observations	5,489	5,489	5,489	5,489	5,489	5,489
Adjusted R-squared	0.046	0.042	0.041	0.044	0.135	0.156
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Demand for monitoring

Monitoring costs Variable definitions	Information opacity			Complexity of operations		
	Industry R&D share (1)	Industry sales growth (2)	Asset intangibility (3)	Multiple plants (4)	Multiple industries (5)	Multiple states (6)
Monitoring cost $t-1$	0.050** (0.020)	0.042*** (0.016)	0.049** (0.020)	0.056*** (0.020)	0.019 (0.020)	0.057*** (0.021)
Constant	0.289*** (0.013)	0.291*** (0.013)	0.279*** (0.016)	0.285*** (0.014)	0.303*** (0.014)	0.286*** (0.013)
Observations	5,489	5,489	5,489	5,489	5,489	5,489
Adjusted R-squared	0.044	0.043	0.044	0.045	0.042	0.045
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 8: Gender Quotas and Gender Gap in Compensation for Independent Directors

This table presents the impact of gender quotas on the gender gap in compensation residuals. Residuals are obtained from a firm-year fixed effects where the dependent variable is the natural logarithm of compensation. The dependent variable is the residual obtained from this regression. *Post reform* is an indicator equal to one for financial years 2014-15 and after as the gender quotas became effective in the financial year 2014-2015. *Female director* is an indicator for female directors. The sample is restricted to firms with at least one female director on their board for the period from 2013 to 2019. We drop the appointment year to avoid confounding the gender gap in compensation with tenure on boards. All the regressions include the following control variables: *Firm size* is the log of book value of assets. *Market-to-book value* is the market-to-book ratio of assets, defined as market value of equity plus book value of debt over book value of assets. *Return on assets* is the ratio of profit after tax to book value of assets. *Stock return* is the annualized return and *Stock return volatility* is the annualized standard deviation of the firm's daily stock returns during the year. In addition, we also include the *Ownership* of the controlling shareholder as a control variable. All controls are lagged by one year. We use ordinary least squares (OLS) regression specification to estimate the coefficients. All specifications include year fixed effects and standard errors are clustered at the firm-level. We also report the *p*-value from an *F-test* that tests if the residuals at the end of the sample are statistically different in comparison to the start of the sample. Standard errors are in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

	All directors		Voluntary directors	
	(1)	(2)	(3)	(4)
Female director	-0.181* (0.092)	-0.163* (0.092)	-0.181* (0.092)	-0.171* (0.092)
Post reform x Female	0.052 (0.091)	0.080 (0.091)	0.172* (0.089)	0.185** (0.090)
Year fixed effects	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
<i>F-test</i> : Female*2013 = Female*2019 (<i>p</i> -value)	0.09	0.07	0.06	0.04
Observations	12,682	12,682	10,530	10,530
R-squared	0.0028	0.0079	0.00040	0.0039

Figure 1: Female directors by year

The top figure plots the average fraction of female directors in percentage by financial year. The bottom figure plots the average fraction of female directors in percentage by financial year for inside and independent directors. The white hollow bars in the plot represent independent directors, while the solid black bars represent inside directors. The solid red line represents the effective date for firms to comply with the gender quota of having at least one female on their boards.

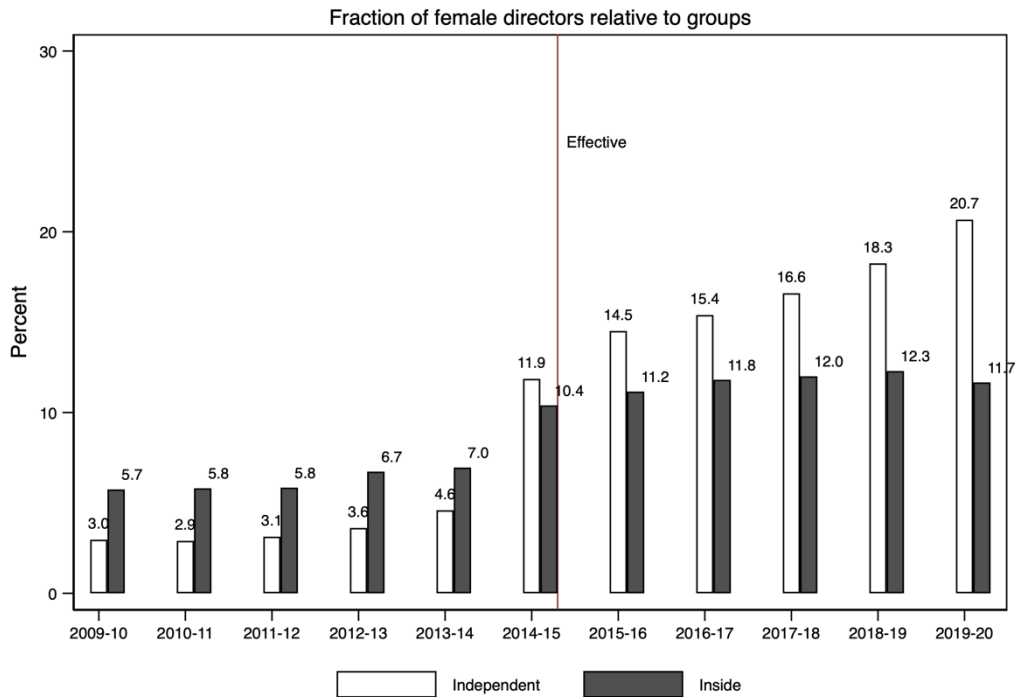
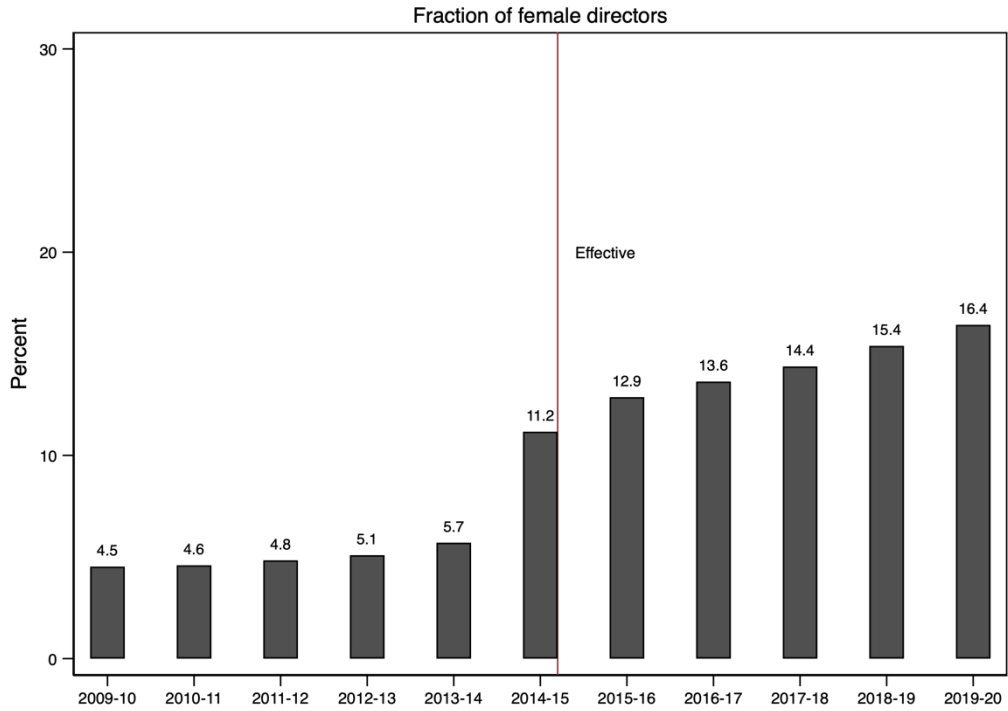


Figure 2: Female director appointments by year

The top figure plots the average fraction of female director appointments in percentage by financial year. The bottom figure plots the average fraction of female director appointments in percentage by financial year for inside and independent directors. The white hollow bars in the plot represent independent directors, while the solid black bars represent inside directors. The solid red line represents the effective date for firms to comply with the gender quota of having at least one female on their boards.

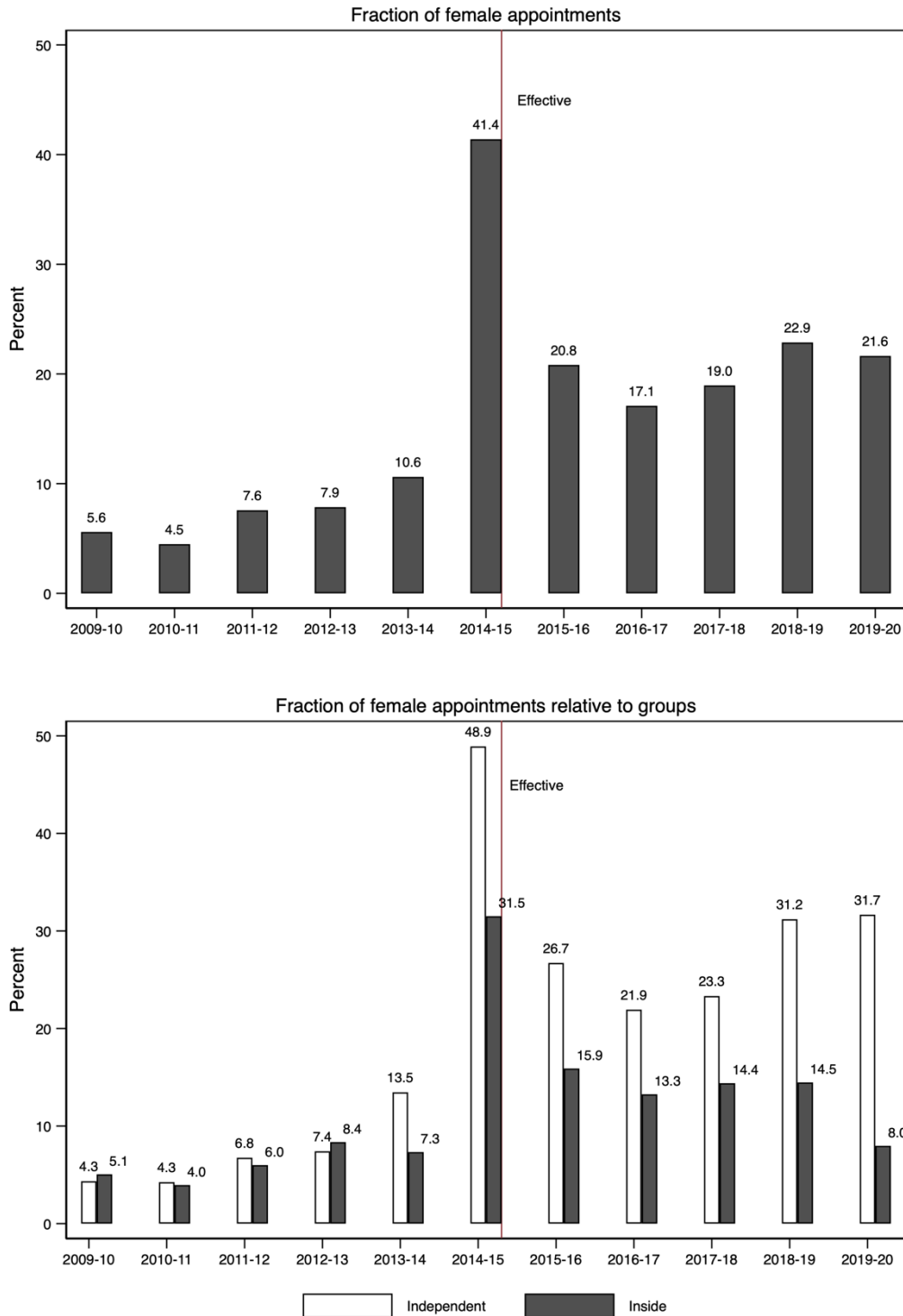


Figure 3: Female director appointments on committees by position

The top figure plots the average firm-level fraction of female directors on audit committees by position held in percentage by financial year. The bottom figure plots the average firm-level fraction of female directors on remuneration committees by position held in percentage by financial year. Across both panels, the white hollow bars represent committee members while the solid black bars represent committee chair. The solid red line represents the effective date for firms to comply with the gender quota of having at least one female on their boards.

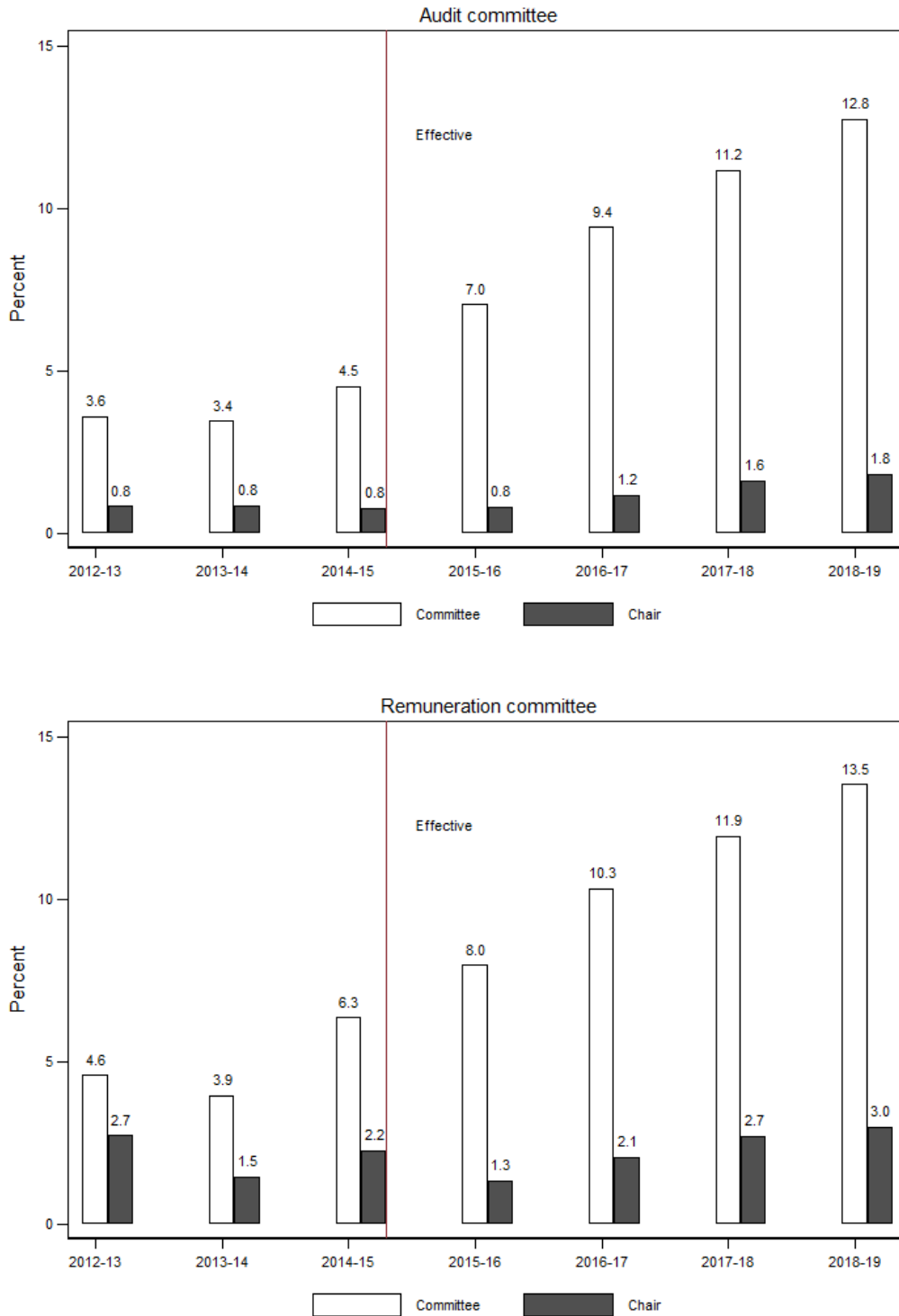


Figure 4: Female director appointments by appointment type

The top figure plots the average fraction of female independent directors appointed by appointment type in percentage by financial year. The bottom figure plots the average fraction of female inside directors appointed by appointment type in percentage by financial year. Across both panels, the white hollow bars represent directors appointed in the financial year 2015 to comply with the gender quota, while the solid black bars represent directors appointed voluntarily by firms outside of the regulation. The solid red line represents the effective date for firms to comply with the gender quota of having at least one female on their boards.

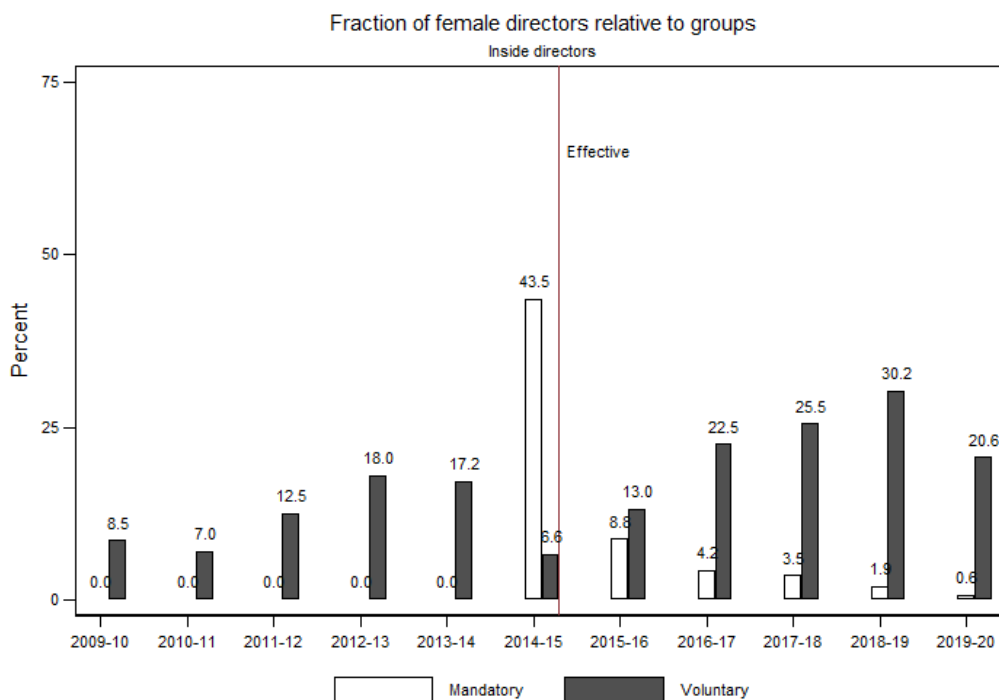
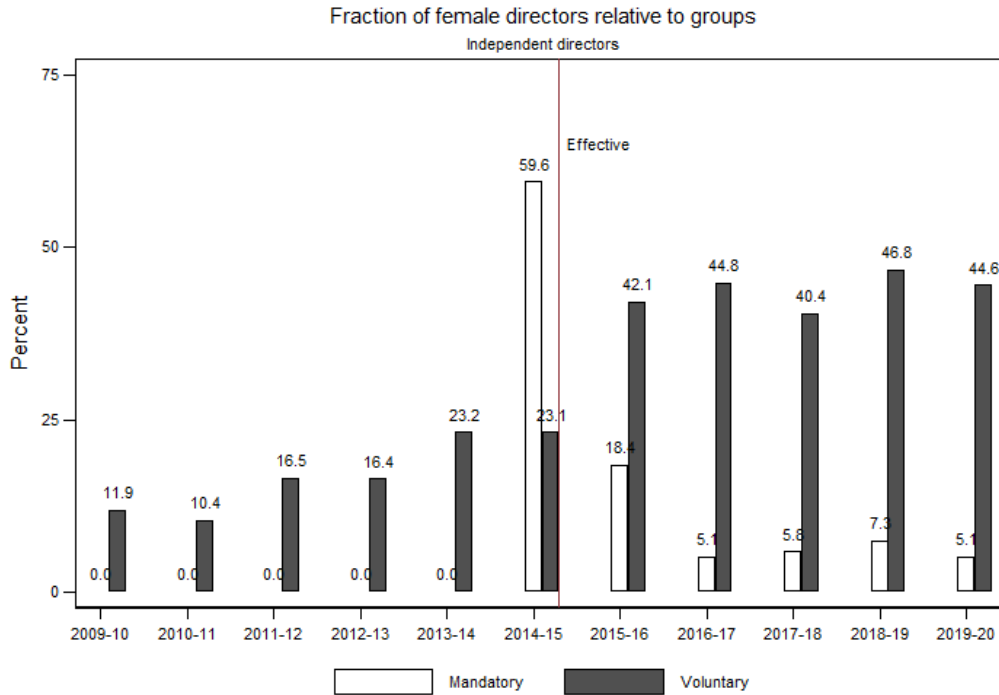
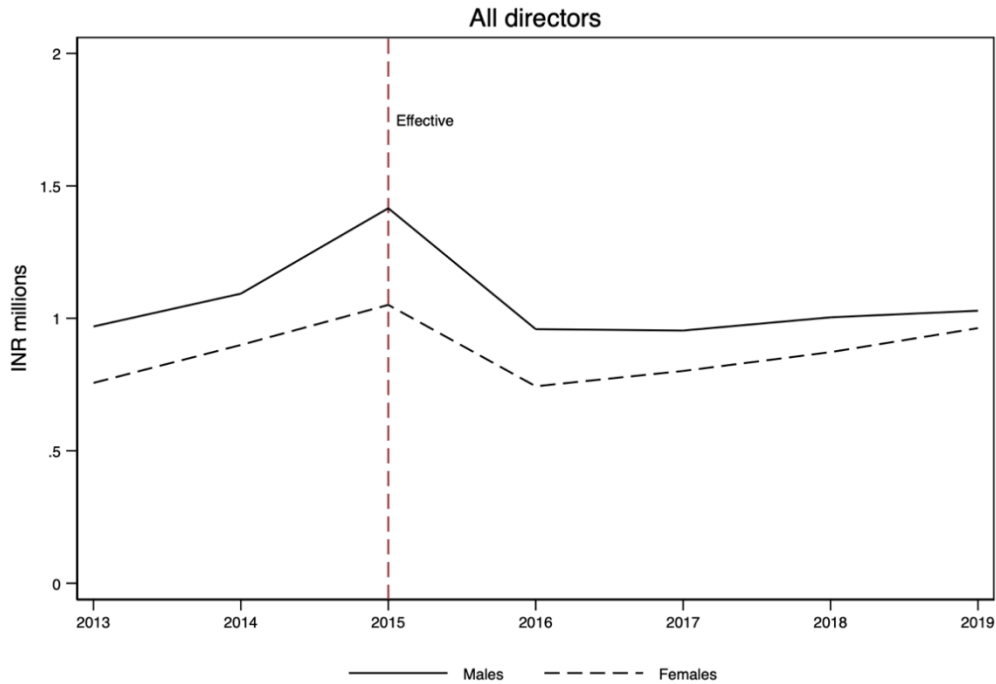


Figure 5: Gender quotas and the gender gap in compensation for independent directors

The top figure plots the average compensation in INR millions by financial year. The middle figure plots the average compensation in INR millions by financial year for directors appointed voluntarily outside the regulation. The bottom figure plots the average compensation in INR millions by financial year for directors appointed in 2015 to comply with the gender. Across both panels, the solid line represents male directors, while the dashed line represents female directors. The sample is restricted to firms with at least one female on their board for the period from 2013 to 2019. We drop the appointment year to avoid confounding the gender gap in compensation with tenure on boards. All compensation values are in INR 2015. The solid red line represents the effective date for firms to comply with the gender quota of having at least one female on their boards.



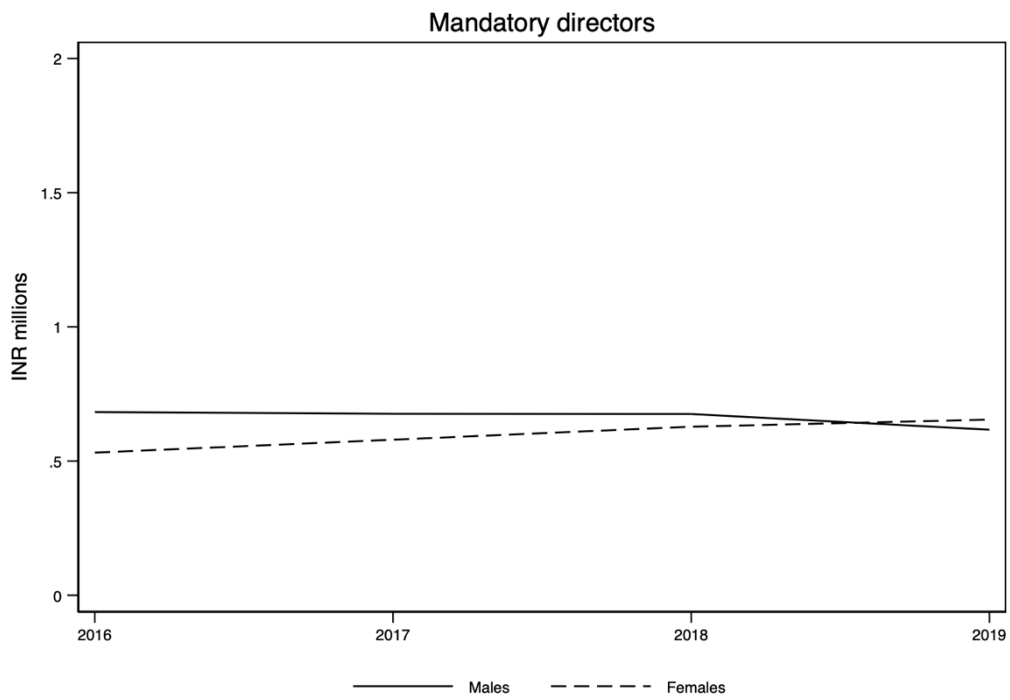
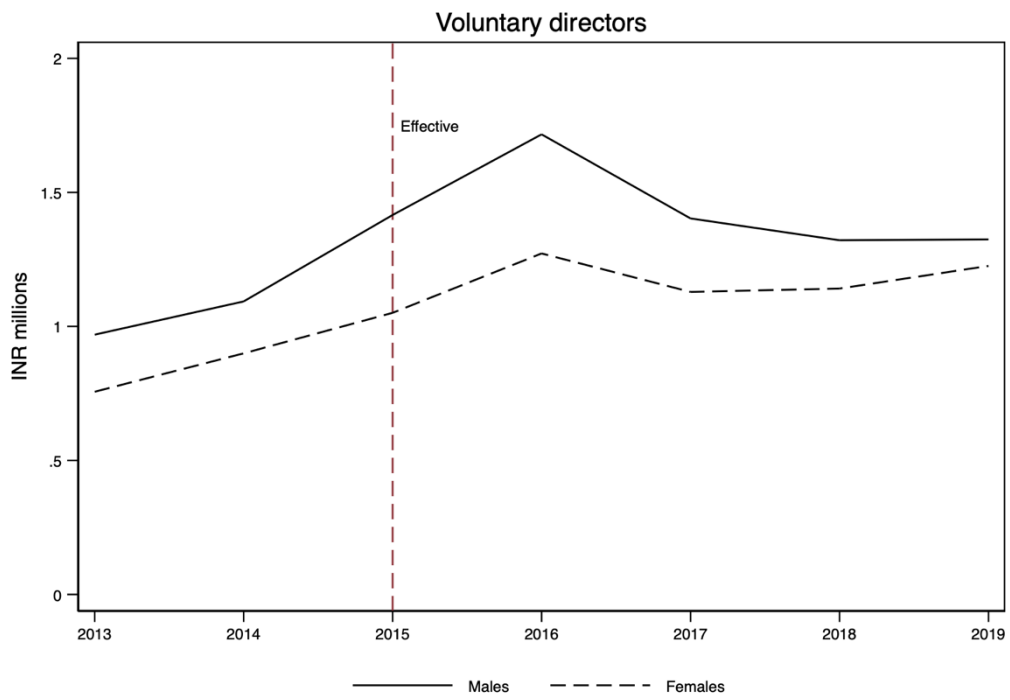
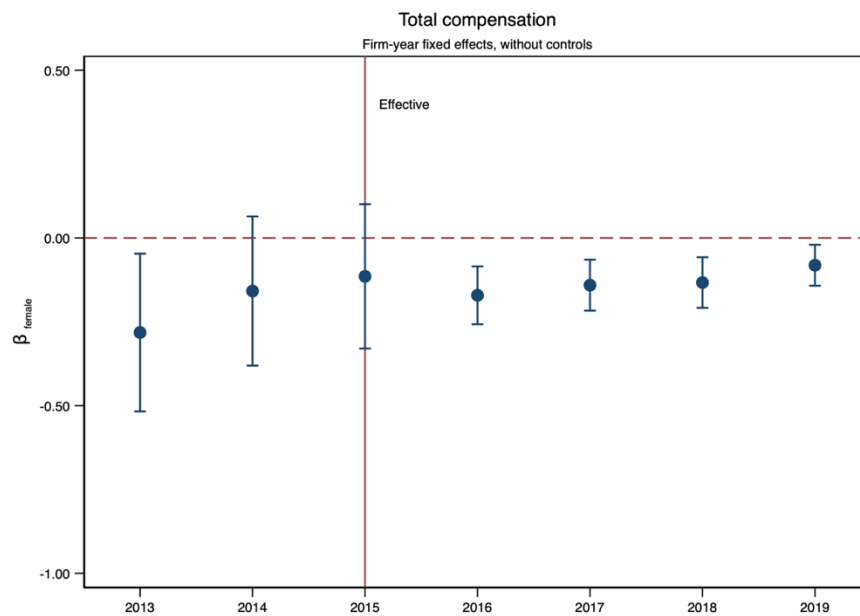
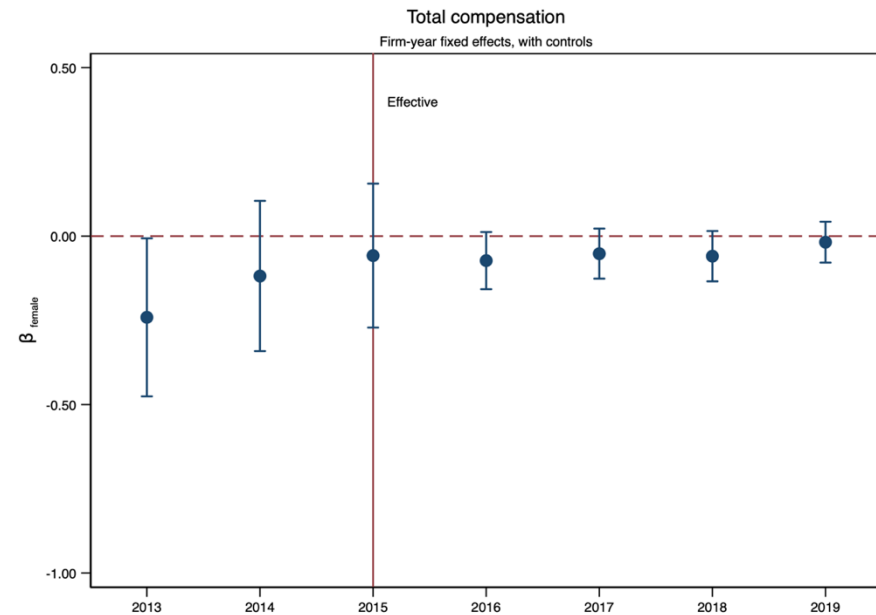


Figure 6: Gender gap in compensation for independent directors by year

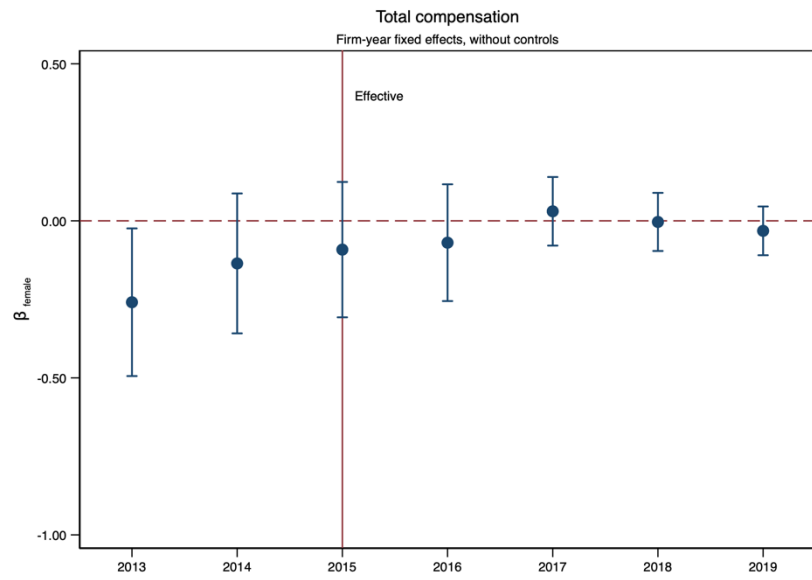
These figures plot the estimated coefficients and their corresponding 95% confidence intervals of the gender gap in compensation residuals by financial year. Residuals are obtained from a firm-year fixed effects where the dependent variable as the natural logarithm of compensation. The top panel plots the estimated coefficients on the gender gap for all directors, while the bottom panel plots the estimated coefficients for independent directors appointed voluntarily outside the regulation. Across both sets of figures, panel (a) does not control for firm or director characteristics while panel (b) controls these characteristics. The sample is restricted to firms with at least one female on their board for the period from 2013 to 2019. We drop the appointment year to avoid confounding the gender gap in compensation with tenure on boards. Standard errors are clustered at the firm-level. The solid red line represents the effective date for firms to comply with the gender quota of having at least one female on their boards.



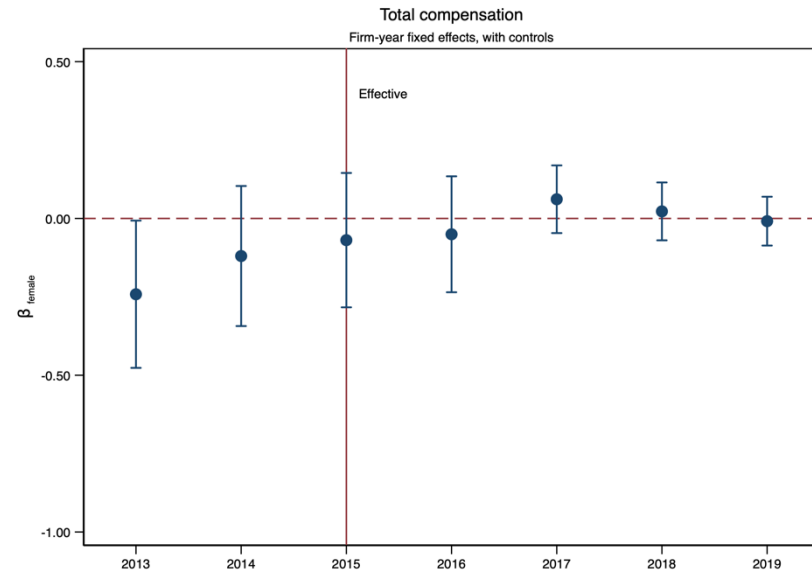
(a) All directors, without controls



(b) All directors, with controls



(c) Voluntary directors, without controls



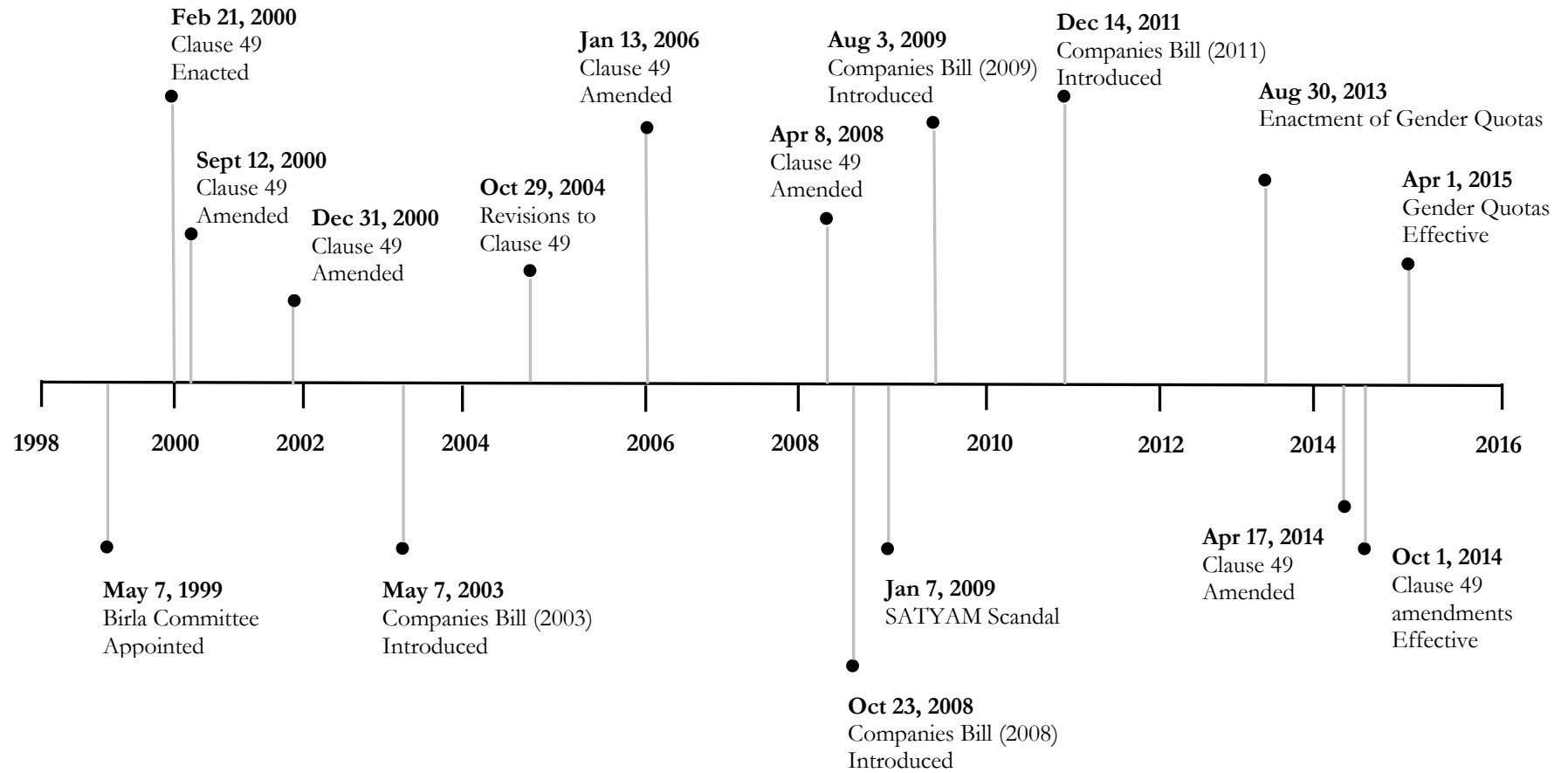
(d) Voluntary directors, with controls

Online Appendix

“Do gender quotas change attitudes towards female directors?”

S. Lakshmi Naaraayanan and Kasper Meisner Nielsen

Appendix Figure A1: Timeline of corporate governance reforms in India



Appendix Table A2: Effect on female director appointments by firm size

This table presents the impact of the gender quota reform requiring firms to have at least one female director on the appointment rates of females by firm size, for the period starting from 2010 to 2020. We drop the financial year 2015 to avoid the mechanical relationship between the reform and female director appointments. Panel A reports the estimates for the top 500 firms (by market capitalization) while panel B reports the estimates for remaining firms in our sample. Across both the panels, the dependent variable is an indicator for a female director. Column 1 includes all directors, column 2 focuses on independent directors, and column 3 focuses on inside directors. Post reform is an indicator equal to one for financial years 2014-15 and after as the gender quotas became effective in the financial year 2014-2015. All the regressions include the following control variables: Firm size is the log of book value of assets. Market-to-book value is the market-to-book ratio of assets, defined as market value of equity plus book value of debt over book value of assets. Return on assets is the ratio of profit after tax to book value of assets. Stock return is the annualized return and Stock return volatility is the annualized standard deviation of the firm's daily stock returns during the year. In addition, we also include the Ownership of the controlling shareholder as a control variable. All controls are lagged by one year. We use ordinary least squares (OLS) regression specification to estimate the coefficients. All regressions include firm fixed effects and standard errors are clustered at the firm-level. Standard errors are in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Large firms

	All	Independent	Inside
	(1)	(2)	(3)
Post reform	0.090*** (0.013)	0.141*** (0.027)	0.059*** (0.018)
Controls	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Adjusted R-squared	0.123	0.233	0.203
Observations	5,818	2,399	2,976

Panel B: Small firms

	All	Independent	Inside
	(1)	(2)	(3)
Post reform	0.197*** (0.023)	0.270*** (0.043)	0.093** (0.040)
Controls	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Adjusted R-squared	0.254	0.398	0.544
Observations	2,690	1,417	984

Appendix Table A3: Appointment characteristics

We report descriptive statistics: mean and standard deviation for our sample of NSE-listed firms from April 1, 2009 to March 31, 2020. Panel A reports director characteristics for female appointees while panel B reports director characteristics for male appointees.

	Financial year											
	All	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Overall (#)	9,897	822	758	832	802	857	1,389	831	772	823	962	1,049
Female (#)	1,780	46	34	63	63	91	575	173	132	156	220	227
Male (#)	8,117	776	724	769	739	766	814	658	640	667	742	822
Panel A: Female directors												
Age (years)	52.5	51.9	51.1	53.6	50.9	54.8	51.4	51.8	53.0	51.9	53.0	55.8
Boards per director (#)	0.19	0.43	0.32	0.35	0.16	0.33	0.08	0.14	0.11	0.14	0.26	0.37
At least one directorship (%)	0.12	0.26	0.12	0.17	0.14	0.14	0.06	0.09	0.10	0.10	0.19	0.22
Board tenure (years)	0.74	1.65	0.43	1.41	0.83	1.24	0.35	0.34	0.53	0.38	1.04	1.55
New director (%)	0.74	0.72	0.79	0.70	0.78	0.68	0.84	0.75	0.74	0.74	0.66	0.59
Independent director (%)	0.61	0.50	0.53	0.35	0.45	0.58	0.64	0.57	0.47	0.63	0.64	0.78
Related director (%)	0.23	0.39	0.26	0.18	0.27	0.19	0.23	0.24	0.28	0.22	0.21	0.16
<i>Specialization</i>												
Accounting, finance, & law	0.49	0.43	0.71	0.44	0.44	0.47	0.49	0.55	0.48	0.37	0.50	0.56
Academics	0.28	0.13	0.41	0.29	0.32	0.33	0.26	0.25	0.24	0.27	0.30	0.34
Business & MBA	0.61	0.48	0.68	0.62	0.70	0.57	0.59	0.58	0.55	0.58	0.60	0.71
<i>Highest degree attained</i>												
Graduate or below	-	-	-	-	-	-	-	0.01	0.01	0.01	-	-
Post-graduate	0.62	0.55	0.63	0.65	0.67	0.69	0.57	0.58	0.73	0.61	0.65	0.63
Doctorate	0.10	0.14	0.09	0.09	0.13	0.14	0.11	0.12	0.04	0.08	0.08	0.10
Panel B: Male directors												
Age (years)	56.4	55.9	55.4	54.8	55.8	56.4	56.6	57.1	56.4	57.2	57.6	58.7
Boards per director (#)	0.35	0.74	0.45	0.43	0.43	0.33	0.29	0.24	0.21	0.22	0.24	0.23
At least one directorship (%)	0.18	0.34	0.23	0.22	0.19	0.17	0.16	0.14	0.13	0.13	0.15	0.13
Board tenure (years)	1.29	1.68	1.29	1.29	1.42	1.10	1.38	1.22	1.14	1.16	1.24	1.18
New director (%)	0.68	0.62	0.69	0.67	0.67	0.68	0.69	0.70	0.70	0.71	0.65	0.68
Independent director (%)	0.41	0.48	0.45	0.38	0.39	0.48	0.41	0.35	0.36	0.43	0.38	0.43
<i>Specialization</i>												
Accounting, finance, & law	0.49	0.47	0.47	0.48	0.47	0.46	0.45	0.51	0.51	0.50	0.55	0.52
Academics	0.24	0.25	0.23	0.23	0.22	0.20	0.21	0.25	0.22	0.27	0.30	0.27
Business & MBA	0.59	0.53	0.54	0.60	0.56	0.50	0.55	0.64	0.60	0.64	0.68	0.64
<i>Highest degree attained</i>												
Graduate or below	-	0.01	-	-	-	-	0.01	-	-	-	-	-
Post-graduate	0.62	0.54	0.60	0.59	0.67	0.62	0.63	0.66	0.63	0.62	0.65	0.59
Doctorate	0.08	0.10	0.09	0.10	0.09	0.10	0.10	0.07	0.07	0.09	0.06	0.06

Appendix Table A4: Female director characteristics by appointment type

We report descriptive statistics: mean and standard deviation for our sample of directors of NSE-listed firms from April 1, 2009 to March 31, 2020. Panel A reports the following director characteristics: *Age* (measured in years), *gender* (indicator taking the value one if the director is female), and *tenure* (measured in years). We measure expertise for each director in two ways. Under *Specialization*, we classify each director based on his educational qualification as well as his occupation. We create an indicator for directors who possess an *accounting, finance & law degree* or is a chartered accountant, CPA, CFA, JD, LLB or LL.M. *Business management & MBA* is an indicator for general business degrees and MBAs. *Academics* is an indicator for professors. Under *Highest degree*, for each director we extract their highest educational qualification and classify them into “*Graduate or below*”, “*Post-graduate*”, and “*Doctorate*”. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

	All	Appointment type		Difference (2) - (1)	t-Stat.
		Voluntary (1)	Mandatory (2)		
Number of director-years	1,780	632	1,148		
Age (years)	52.5	52.8	52.3	-0.50	-0.76
Boards per director (#)	0.19	0.28	0.14	-0.14	-4.61***
At least one directorship (%)	0.12	0.16	0.10	-0.06	-3.45***
Board tenure (years)	0.74	1.12	0.53	-0.59	-4.06***
New director (%)	0.74	0.71	0.76	0.05	2.32**
Independent director (%)	0.66	0.61	0.69	0.08	3.32***
Related director (%)	0.20	0.19	0.21	0.02	0.76
<i>Specialization</i>					
Accounting, finance & law	0.49	0.51	0.49	-0.02	-0.94
Business & MBA	0.28	0.31	0.26	-0.05	-2.05**
Academics	0.61	0.61	0.60	-0.01	-0.53
<i>Highest degree attained</i>					
Graduate or below	0.00	0.00	0.00	0.00	-1.05
Post-graduate	0.62	0.64	0.61	-0.03	-1.57
Doctorate	0.10	0.10	0.10	0.00	-0.08