HOW DO FIRMS RESPOND TO GENDER QUOTAS? EVIDENCE FROM CALIFORNIA'S SENATE BILL 826

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Abstract

This study examines the impact of California's SB826, enacted in 2018 and requiring at least one female director on corporate boards by the end of 2019, on financial performance and corporate governance. The quota dramatically increased female representation on boards by 26 percentage points without negatively affecting financial performance from 2018 to 2021. Corporate governance measures remained stable during this period. These results are consistent with both the integration of qualified female candidates and the presence of tokenism. The former suggests that network barriers, rather than a lack of qualified female candidates, contribute to the persistence of all-male boards. *JEL Codes: G38, J16, J24, K38, M14*

1 Introduction

Even as the female fraction of MBA students in recent years hovers around 50%, it is nonetheless rare today for top corporate leadership positions in the U.S. to be occupied by women (Figure I). Gender quotas on the boardroom are often proposed as policy prescriptions to increase diversity, but it is unclear whether they should worsen, improve, or have no effect on financial performance and corporate governance. In a textbook argument, firms optimally choose the board of directors to maximize shareholder value (e.g. Ahern and Dittmar 2012). External factors that constrain the firm's ability to optimize, such as a government mandated gender quota, should then worsen outcome measures. It is frequently asserted that women are underrepresented in top corporate leadership positions because they possess less relevant work experience, such as prior board or executive leadership roles. If so, the quota may coerce firms to hire female directors with less top-level experience who, in turn, reduce measures of financial performance and disrupt corporate governance.

A competing view highlights that quotas may improve financial performance and corporate governance by encouraging companies to search for candidates with distinctive work experiences. These directors may improve outcomes by bringing new skills into the boardroom or monitoring corporate executives more closely (Kim and Starks 2016; Adams and Ferreira 2009). Firms may not have previously considered quota-appointees for board positions because these candidates do not belong to the typical hiring networks used for recruitment (Hallock 1997). Applicants without referrals may be perceived as lower-ability or more-risky, which would systematically disadvantage women if they do not have connections to corporate leadership. However, quota-appointed directors may also be token appointments, lacking the influence to shape the board of directors' collective decision making (e.g. Hwang, Shivdasani, and Simintzi 2018). This may be especially true when the quota-appointed director is the sole female on a large board.

To investigate these considerations, I study how firms responded to California's SB826, the first gender-based quota for corporate boards in the United States.[1] The legislation passed in late

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[1]For a list of gender quotas implemented outside the United States, see Table 1 of Terjesen, Aguilera, and Lorenz

2018, and mandates that listed companies headquartered in California have at least one female director by the end of 2019. As an enforcement mechanism, annual fines ranging from \$100,000 to \$300,000 are levied on companies that fail to comply. This study focuses on the medium-term effects of the quota, analyzing corporate responses over the three years following its implementation. In this paper, I ask the following questions: 1. How effective was the quota in increasing female representation on corporate boards? 2. What are the causal effects of the quota on financial performance and corporate governance measures? 3. How prevalent is tokenism in the integration of newly appointed female directors? 4. To what extent do professional networks contribute to the limited representation of women on corporate boards?

I link data between BoardEx, Compustat, and the Center for Research in Security Prices (CRSP) to investigate these questions. BoardEx provides comprehensive annual information on the gender composition of corporate boards, committee assignments, board size, and the share of non-executive directors, which are key measures of corporate governance. It also includes director characteristics and work histories, allowing me to assess the qualifications of new board members. Additionally, BoardEx contains the professional networks of directors, facilitating an analysis of how these networks contribute to persistence of all-male boards. I consider various annual measures of corporate performance constructed from Compustat's files, including Return on Assets, Return on Equity, Tobin's Q, Market to Book ratios, Cash Flows, and an overall index of financial outcomes. I use CRSP's daily security-level returns to calculate the abnormal returns from holding a portfolio of quota-affected companies. CRSP also provides data on outcomes influenced by board decisions, such as dividend issues, mergers and acquisitions, delistings, and changes in shares outstanding, which are further measures of corporate governance.

To identify the causal effects of the quota, I track firm-level outcomes of all domestic and listed companies that had no female board representation in 2017, the year prior to the reform. Among these companies, only the firms based in CA as of 2017 ("treated or quota-affected firms") had

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(2015). For a comparison of gender quotas across Europe, see Table 1 of Mensi-Klarbach and Seierstad (2020). SB826 does have additional requirements. By the end of 2021, companies with 5 directors are mandated to have at least 2 female directors and companies with 6 or more directors are required to have at least 3 female directors. I study how companies responded to the first stage of SB826.

to change board composition or corporate form to abide with SB826's requirements. These firms represent the companies that would face fines if they did not comply with SB826. While the quota might discourage firms with gender-diverse boards from becoming all-male, such transitions are rare. Therefore, I consider firms with all-male boards and California headquarters prior to SB826 as the quota-affected group. I use the firms based outside of California and with all-male boards in 2017 as my control group and verify that the conditional independence assumption is likely to hold.[2] I consider specifications where the quota's effect may vary year over year (Event Study), but also those where the effect is presumed to be immediate and constant (Difference in Differences). Statistical precision is enhanced in the latter specification, though it is unable to recover whether the quota has time-varying effects. To address concerns about California-specific trends unrelated to the quota, I also estimate a triple-difference specification that incorporates California-based firms with gender-diverse boards in 2017 as a within-state control group.

I find that SB826 successfully introduced gender diversity onto corporate boards without negatively affecting financial performance. Between 2017 and 2019, the number of California-based listed companies with all-male boards declined from 204 to 59, representing a 71% reduction.[3] This dramatic increase in boardroom gender diversity is not entirely attributable to the quota. Gormley et al. (2023) document that in 2017, large institutional investors led campaigns to increase boardroom gender diversity among all American corporations, and that these pressures quickly succeeded in increasing female boardroom representation. Consistent with this observation, difference-in-differences estimates indicate that SB826 reduced the share of all-male boards by a more modest 26 percentage points. Robustness tests suggest that these results are not driven by shifts in attitudes about women in leadership particular to California: the triple differences

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[2]The baseline event study econometric specification, stated in Equation 1, contains firm and industry by year fixed effects. Standard errors are clustered at the firm level. The quota's effects are identified based on a comparison of outcome changes between companies that did and did not have CA headquarters in 2017. The assertion that the conditional independence holds is supported by the fact that $\hat{\beta}^t, t \leq 2017 \approx 0$ for a variety of outcomes. As a robustness check, I also consider specifications where the treated (control) companies consist of all (non)-CA-based listed companies as of 2017. As expected, the effects of the quota on board gender composition is smaller in this expanded sample.

[3]This statistic does not imply that 59 companies are non-compliant with SB826's requirements. Each year, BoardEx reports board gender diversity as of the company's annual report date, which typically occurs before December 31st of the calendar year.

specification that includes California-based companies with gender-diverse boards in 2017 as a within-state control group yields nearly identical point estimates. Furthermore, the quota did not cause affected companies to take evasive actions such as delisting or changing corporate form, as annual rates of these variables are similar between the treatment and control groups.

An investment strategy of buying and holding a value-weighted portfolio of quota-affected companies from October 1st, 2018 (the first trading day after the legislation's signing) to December 31st, 2021 does not generate abnormal returns that are statistically different from zero.[4] The difference-in-difference specifications indicate that the legislation modestly improved operating performance, though statistical significance varies depending on the choice of outcome variable. I find that SB826 increased Tobin's Q by 7%, Return on Assets by 5 percentage points, and Cash Flows by 5 percentage points – all effects are statistically significant at the 10% level.[5] While the point estimates on the remaining operating performance measures considered – Return on Equity, Market to Book, and the index of financial outcomes – are all positive, they are not statistically significant at conventional levels. Interpreted conservatively, my results imply that the quota did not worsen financial performance within three years and, if anything, improved them. This conclusion remains valid under various econometric specifications, splits of the sample, and financial outcomes considered. The minimal effects of the quota on financial performance are consistent with minimal changes in company policy after the legislation. I find null effects of the quota on outcomes the board influences, such as rates of delistings, mergers and acquisitions, dividend issues, and changes in shares outstanding.

The relationships between SB826, financial outcomes, and company policy could be explained in several ways. One hypothesis is that firms continued business as usual and hired "token" female directors – those who have minimal influence on the board. An alternative hypothesis is that quota-affected firms recruited qualified women who were seamlessly integrated onto boards. These

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[4]In particular, I can reject negative annualized abnormal returns of 3% and larger.

[5]These point estimates do not appear to be driven by favorable economic conditions experienced by all California-based firms in the post-treatment period. The triple differences specification that uses CA-based companies with gender-diverse boards in 2017 as a within-state control posits that the quota raised Tobin's Q, ROA, and Cash Flows by similar magnitudes.

qualified women may have previously been excluded from boards because directors typically have employment connections with corporate leadership and women are less likely to possess these networks. I find support for both hypotheses, with the tokenism hypothesis holding less support among companies with smaller boards and more support among companies in male-dominated industries.

Several facts support the tokenism hypothesis. First, many quota-affected firms chose to expand their board size rather than replace existing male directors. In 2019, the rate of board expansion rose by 14 percentage points, a substantial increase relative to the mean rate of 23 percentage points. By adding female directors to larger boards, these firms can fulfill regulatory requirements without fundamentally altering the decision-making power of incumbent directors. Second, quota-affected firms refrained from placing incoming women onto the audit committee, which is regarded as one of the most important institutions within corporate boards since its members monitor financial reporting and disclosure (Ferris, Jagannathan, and Pritchard 2003). I find SB826 lowered the share of the board on this committee by 2 percentage points. Third, the quota lowered the share of the board with prior board and executive leadership experience by 2-3 percentage points, which suggests that firms may have prioritized superficial compliance over the selection of directors with substantial decision-making authority or governance expertise. Fourth, the quota increased the share of non-executive directors in 2019 by 1.3 percentage points, with more than 90% of incoming female directors to treated companies taking on these roles. Non-executive directors typically have less direct influence on daily management and strategic decisions compared to executive directors.[6] By appointing women primarily to non-executive roles, firms may appear to comply with the letter of the law while maintaining existing power structures. These indications of tokenism are particularly salient in male-dominated industries, where qualified female candidates may be harder to find, and less prominent among smaller boards, where each director's influence is more

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[6]Non-executive directors had a median annual salary of $107,000 as of 2020, which is comparable to the fines for non-compliance with SB826, ranging from $100,000 to $300,000 annually. Given that the salary for non-executive directors is similar to the lower end of the fine spectrum and significantly less than executive director salaries, it is economically rational for companies to comply with the quota by hiring non-executive directors rather than risk facing these fines.

significant.[7]

The minimal effects of the quota on financial performance and company policy can also be attributed to the effective integration of qualified female candidates onto corporate boards. First, the quota did not alter the average age or educational levels of board members. While there was a slight decline in overall board and C-suite experience, there was no decline in industry experience. This fact suggests that the women who joined boards due to the quota were already seasoned professionals within the same industries as the treated firms, bringing industry-specific knowledge to their roles. Moreover, the decision of firms to comply with the quota, rather than paying the associated fines, changing headquarter location, or delisting, further supports the notion that integrating qualified women was both feasible and beneficial. The fact that female directors rarely joined the boards of multiple treated companies indicates that there was a sufficiently large pool of qualified candidates available, countering the notion of a shortage of qualified women. This availability is further evidenced by the fact that there are far more women in corporate leadership positions in the U.S. than there are board positions that needed to be filled due to the quota. Additionally, there were no discernible reductions in the share of the board on the compensation or nominating committees, which are monitoring-intensive committees vital for corporate governance and oversight. This evidence suggests that while quota-appointed directors were not immediately assigned the most critical responsibilities – such as positions on the audit committee – they still played important roles on the board. Notably, I observe positive and statistically significant financial performance effects among small boards, where quota-appointed directors likely had more influence. This outcome suggests that when female directors are actively involved in decision-making, their contributions can enhance financial performance.

If the quota successfully introduced qualified women onto boards, a question arises: why were these women not already present in these roles? One reason could be the heavy reliance on personal networks and employment connections in the recruitment process for board members. Histori-

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[7]For example, the quota lowered the share of the board on the audit committee by 2.6 p.p. among small boards and by 3.5 p.p. among firms in male-dominated industries. Among small boards, the quota raised the rate of board expansion by 5.8 p.p, while the expansion rate for firms in male-dominated industries is 7.3 p.p.

cally, boards of directors have been composed largely through personal contacts and professional networks, favoring individuals who already have established relationships with current board members or senior leadership. Men, who have traditionally dominated senior leadership positions, are more likely to have these crucial employment connections. Among all domestic and listed firms between 2015 to 2020, 61% of incoming male directors have a prior employment connection with at least one member of the board or senior leadership, compared to only 39% for female directors.[8] This disparity suggests that qualified women might have been overlooked not due to a lack of qualifications, but because they were less likely to be part of the existing networks that facilitate board appointments. The introduction of the quota, therefore, provided an opportunity for firms to consider a broader pool of candidates, including those without prior employment connections to corporate leadership. I find that SB826 lowered the share of directors with a prior employment connection to the incumbent board by 3%. This pattern is consistent with underlying network differences between male and female directors and highlights the quota's role in bringing in talented women who may have otherwise been excluded due to the informal, network-driven nature of board recruitment.

This paper contributes to literature that examines how gender diversity affects organizational outcomes. Research studying firm responses to SB826 has focused on stock price reactions in the immediate days following the legislation's announcement (Hwang, Shivdasani, and Simintzi 2018; Von Meyerinck et al. 2019; Gertsberg, Mollerstrom, and Pagel 2021; Greene, Intintoli, and Kahle 2020). These studies establish negative announcement returns ranging from 1-2%, but face the limitation that the effect may be driven by regulatory uncertainty or other bills signed on the same day.[9] I circumvent these challenges by analyzing the longer-run impacts of the quota. In that sense, my methodology more closely resembles the literature evaluating the longer-run effects of the

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[8]For contacts with the C-suite, 41% of incoming male directors have prior employment connections, while the corresponding figure for women is 19%.

[9]Von Meyerinck et al. 2019 document that the governor signed 183 bills on the weekend in which he signed SB826. Further, they show states with similar political leanings to California also experienced negative abnormal returns, suggesting regulatory uncertainty may contribute to the stock price reaction. To address this limitation, Allen and Wahid (2023) exploit the political events leading up to the passage of SB826 as exogenous shocks to assess the effects of board gender diversity on market values, and find either significantly positive or insignificant two-day abnormal returns for California firms.

2003 Norwegian quota. Ahern and Dittmar (2012) find that the quota resulted in substantial non-compliance, less experienced boards, and lower firm values within 5 years. Bertrand et al. (2019) show that the female directors appointed after the quota were more qualified than those appointed before the quota along many dimensions. These results may not necessarily hold in the US context since the Norwegian quota required 40% female board representation while California's mandated the presence of a single female director. Indeed, in the three years following SB826, the legislation has led to almost universal compliance without any reductions in financial outcomes.

Outside the immediate context of corporate boards, studies have arrived at various insights on how female leadership affects organizational outcomes. For instance, Gompers et al. (2022) find that gender diversity at the partner level increases fund returns. Chattopadhyay and Duflo (2004) study a 1992 gender quota in India that required one-third of local political positions be reserved for women. They document that women policy-makers invest more in projects that address the needs of women. My paper contributes to the literature by showing that mandated gender diversity can introduce qualified women onto corporate leadership, thereby creating gains in female representation without generating losses in financial performance.

This paper unfolds as follows. I discuss the quota's requirements in Section 2 and the data utilized in Section 3. In Section 4, I describe compliance with the legislation. Section 5 discusses the legislation's impacts on financial performance, while Section 6 inquires how the quota shifted the board's characteristics and decision-making. Section 7 concludes.

2 Legal Context

California Governor Jerry Brown signed into law Senate Bill (SB) 826 on 9/30/2018, which requires publicly-held corporations with a principal executive office in California to have at least one female director on the Board of Directors by December 31, 2019. By the end of 2021, companies with 5 directors are mandated to have at least 2 female directors and companies with 6 or more directors are required to have at least 3 female directors. I study how companies responded to the

first stage of SB826, which is the very first board gender-quota in the United States.[10]

The legislation impacts companies based in California with shares listed on the New York Stock Exchange, NASDAQ, or NYSE American. SB826 does not cover private companies or listed companies with headquarters outside of California. Companies that fail to comply with the quota are subject to fines: each director seat required to be held by a female that is not actually held by a female for at least a portion of the calendar year counts as a violation. A fine of $100,000 is imposed for the first violation, and $300,000 for each subsequent violation.[11] California-based firms impacted by SB826 have a couple of options to avoid paying fines. First, shareholders of these companies can add a female board member by the end of 2019, either by replacing an existing male director or by expanding the size of the board. Second, these companies can evade the reach of the legislation by going private or changing headquarter location.

Firm responses to California's gender quota can provide guidance on the efficacy of more recent boardroom diversity, equity, and inclusion (DEI) efforts. In mid-2021, the Securities and Exchange Commission approved NASDAQ's board diversity disclosure requirements that encourage (but do not require) companies listed on its exchange to have at least two diverse directors by mid-2023. Within the last year, large asset managers such as Blackrock and Goldman Sachs have urged US companies to have diverse boards. The California agency responsible for SB826's enforcement never issued fines on companies that maintained all-male boards beyond the end of 2019. Nevertheless, as I will show in Section 4, companies subject to the quota swiftly added female directors. These results suggest that public pressures for firms to increase minority representation can be

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[10]According to the CA Secretary of State, "A female is an individual who self-identifies her gender as a woman, without regard to the individual's designated sex at birth." Therefore, companies that hire transgender individuals who self-identify as female will be compliant with the legislation's requirements. Publicly-held companies have shares listed on the New York Stock Exchange, NASDAQ, or NYSE American. SB826 does cover companies listed on foreign exchanges with headquarters in CA. I exclude consideration of these companies since my analysis focuses on domestic and listed companies. Between 2015 and 2020, no state besides California has passed a corporate board gender quota that enforces fines on non-compliant companies. On May 13th, 2022, Los Angeles Superior Court Judge Maureen Duffy-Lewis found that SB826 violates the equal protection clause of California's constitution: https://corpgov.law.harvard.edu/2022/06/12/california-gender-board-diversity-law-is-held-unconstitutional/

[11]For example, a listed California-based company that has no female board members between 1/1/2019 and 12/31/2020 would owe a fine of $400,000. Failure to file timely board gender information with California's Secretary of State yields a $100,000 fine. As of December 2021, no fines have been assessed as SB826 faces legal challenges: https://www.reuters.com/world/us/trial-begins-challenge-california-women-boards-law-2021-12-01/.

successful in changing a firm's employment practices (i.e. Gormley et al. 2023)

3 Data Sources and Sample Description

3.1 Data Sources

I employ matched data between BoardEx, Compustat, and CRSP to study relationships between director characteristics, board characteristics, and firm outcomes.[12] BoardEx provides detailed information on the composition of corporate boards and the employment histories of directors. Using information from a company's annual reports, BoardEx provides yearly descriptors of the board's size and gender composition. BoardEx also characterizes the gender and employment histories of directors in its database by scraping online reports. Prior roles of directors contain a start and end date, allowing me to construct measures of a director's experience. These employment histories also enable BoardEx to determine whether any two directors in its database share a prior employment connection. I restrict attention to the sample period starting in 2010 and ending in 2021.

I observe the annual board composition of approximately 4000 companies (Table I), which represents the near-universe of domestic and listed companies between 2010 and 2021.[13] I use BoardEx data to assess compliance with the quota and examine the characteristics of directors added after SB826. Director characteristics are measured upon onboarding and include traditional measures of human capital – age, education, and experience – as well as indicators for whether the director joins a monitoring-intensive committee or has prior employment connections with

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[12]I use the crosswalk provided by WRDS and deploy a conservative approach that requires matched companies to have have identical SEC identifiers (CIKs) and security level identifiers (CUSIPs) across BoardEx, Compustat, and CRSP.

[13]The annual characteristics of the board are measured as of the company's annual report date. If there are multiple annual reports in a single calendar year, I select the last annual report. BoardEx does not impute gender. Instead, gender is based on self identification or pronouns used in official reports. See Figure A1 for an example report where pronouns are used to classify gender. If two directors have a prior employment connection, the dates in which the two directors overlapped at the previous company are provided. The number of domestic and listed companies from BoardEx and CRSP are approximately equal.

company leadership.[14] A primary responsibility of monitoring-intensive committees is to oversee financial statements and reporting. Less capable boards may be more likely to make errors in reporting financial statements and consequently face litigation for securities fraud. To examine this hypothesis, I identify companies that faced class-action lawsuits between 2015 to 2021 from the Stanford Securities Class Action Clearinghouse, producing a sample of 1646 firms.[15]

I next use data from Compustat and CRSP to study how the quota affected firms' financial outcomes and policy. Each year, more than 90 percent of companies from BoardEx can be linked to Compustat and CRSP (Table A2, Col 3), covering the near universe of domestic and listed companies. Using annual data from Compustat, I construct various measures of Operating Performance that are measured at the end of a company's fiscal year. Following existing literature (e.g. Adams and Ferreira 2009; Ahern and Dittmar 2012), I focus on Tobin's Q and Return on Assets. Tobin's Q is defined as the ratio of the firm's market value to its book value of assets, where market value is book assets plus book equity minus the market value of equity. Return on Assets (ROA) is net income before extraordinary items and discontinued operations divided by book assets. In rare instances, companies report non-positive total assets or book assets, in which case the observation is dropped.

Shareholder returns and company policy variables are derived from CRSP. Delisting occurs if none of the company's securities are listed the subsequent year. All other company policy variables indicate if the event occurred for some security during the calendar year. For example, a company is defined to issue a dividend if any of the company's listed securities offers a dividend during the calendar year. Buy-and-hold returns are calculated using returns provided in the daily stock file. Among companies with multiple securities, I choose the security with the highest average trading volume between Jan 2nd, 2015 and March 31st, 2022. In calculating buy-and-hold returns, I exclude companies that delist and have missing delisting returns, or do not delist and have missing

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[14]Monitoring-intensive committees are defined to be the audit, compensation, and nominating committees. I observe whether a director has a prior connection to company leadership, but also the type of connection. I.e. whether two directors previously served together on a board or c-suite of another company.

[15]As discussed in Ferris, Jagannathan, and Pritchard (2003), the firms sued in this dataset have not necessarily committed fraud. Furthermore, firms sued in a given year may have committed fraud in previous years.

returns over the holding period. Companies may respond to the quota by delisting or changing headquarter locations. I acquire annual information on each company's headquarter location from Compustat Snapshot to investigate this possibility.[16]

3.2   Sample Description

Table I shows the sample size by year, once I restrict to US-based listed companies that report the firm's headquarter location and board gender composition. Between 2015 and 2021, 16 to 20 percent of all firms in the sample are headquartered in California. In the three years prior to the legislation, 31 to 39 percent of CA-based firms had all-male boards, with a combined market value of approximately 123 billion dollars as of the first quarter of 2017.

Despite the fact that SB826 regulates board gender composition for all listed firms based in California, many legally affected firms are unlikely to actually modify their boards to respond to the gender quota. CA-based listed companies with at least one female board member prior to the legislation's passage would not need to make any changes to be compliant with SB826. In theory, the gender quota may deter firms already compliant with SB826 from transitioning to an all-male board. However, historical data demonstrates that firms overwhelmingly add, rather than remove, women to the board as the firm ages (Figure A2). As a result, I define firms affected by the quota ("treated firms") to be CA-listed companies with all-male boards in 2017, the year prior to the legislation's passage. Analogously, I define the control group to be firms with all-male boards and headquarters outside of CA as of 2017.

There are cross-sectional differences between firms in the treatment and control groups, as observed in Table II. In 2017, treated firms have smaller boards, are younger, and have fewer employees than control firms. In addition, treated firms have a stronger presence in manufacturing,

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[16]Geographic identifiers include both the state of the company's principal executive offices and the country of incorporation. These values are taken from Compustat Snapshot. If missing, geographic identifiers are taken from the WRDS SEC Analytics Suite. WRDS SEC data are linked to the matched BoardEx-Compustat data using the cik-gvkey linking table provided by WRDS. If the geographic identifier is still missing and the year is past 2019, the value is taken from Boardex's header-level information provided in the Company Profile files. Each year, more than eighty five percent of companies from BoardEx can be matched to CRSP, quarterly financial data, historical listing exchange identifiers, and historical geographic identifiers, as seen in the final column of Table A2.

have higher Tobin's Q, and are less likely to issue dividends than control firms. Despite differences in financial outcomes, many boardroom level characteristics are similar between the treatment and control groups. Average ages of directors joining the two groups are nearly identical, though directors joining treated firms are slightly more likely to have prior board and c-suite experience. The share of the board on the auditing committee is lockstep between the treatment and control group. Similar conclusions hold for the compensation committee, though treated firms have a larger share on the nominating committee. The level differences between treatment and control firms do not pose a problem for my identification strategy, which relies upon parallel trends in potential outcomes.

4   Compliance with SB826

Studies of board gender quotas in other countries suggest that companies may restructure to avoid adding female directors.[17] SB826's monetary penalties for non-compliance are mild relative to penalties in other contexts, so one would expect far less evasive behavior among California-based firms affected by the gender-quota. Indeed, I find no evidence that firms took evasive actions. Between 2017 and 2020, 19% of treated firms delisted, relative to 18% in the control group (Table A3).[18] The two-sided t-tests presented in Table A4 reject the presence of differential attrition between the treatment and control groups.

Quota-affected firms in CA did not systematically evade the legislation through corporate restructure, but did they actually add women into their boards? After all, treated firms that want to maintain all-male boards have the option of paying fines described in Section 2. There is suggestive evidence that the quota caused firms to add female directors. First, there were 204 California companies with all-male boards in 2017, but only 12 in 2021 (Table I). Second, the probability

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[17]For example, Norway passed a gender quota in 2003 that required all public limited liability companies to have at least 40 percent representation of each gender. Any public limited liability company that failed to meet the requirements as of 2008 would be forced to dissolve. Bertrand et al. (2019) document sizable evasion: of the 563 public limited liability companies affected by the quota in 2003, only 179 maintained corporate form by 2008.

[18]The same table indicates that between 2017 and 2020, 6% of treated firms changed headquarter location, relative to 10% in the control group.

that a California-based company maintains an all-male board the subsequent year declines from 93

percent in 2010 to 30 percent in 2018.

However, these changes may not solely reflect the causal effect of the gender quota. Over-

all shifts in attitudes about women in leadership positions that occur during the sample period

could be a confounding factor. To investigate the contribution of SB826 to the dramatic decline of

California-based companies with all-male boards, I consider changes in board composition among

non-CA-based firms with all-male boards in 2017 as a comparison group ("control firms"). For-

mally, using the firm-year panel from 2015 - 2021 and ordinary least squares, I estimate the pa-

rameters of the following regression:

$$Y_{fti} = \gamma_0 + \sum_{t \neq 2017} \beta^t \Big(1[Year = t] \times CA\ HQ_{2017} \Big) + \delta_f + \delta_{ti} + \varepsilon_{fti}, \tag{1}$$

where Y_{fti} is the board composition of firm f in year t and industry i, δ_f are firm fixed effects,

δ_{ti} are industry by year fixed effects, and γ_0 is a constant. I use industry by year fixed effects

to account for different industry compositions between treatment and control firms (see Table II).

Estimates of β^t represent differences in outcomes between treatment and control firms in year t

relative to 2017. For these estimates to identify the causal effect of SB826, it is necessary that the

variables excluded from Equation 1 trend similarly between treatment and control firms within the

same industry ("Parallel Trends Assumption").[19] All regressions use an unbalanced panel of firms

and cluster standard errors at the firm level.

If the parallel trends assumption holds, then estimates of β^t for $t < 2019$ should be close to

0. Indeed, changes in outcomes between the 204 treated firms and 942 control firms are similar

prior to the quota. Almost all outcomes related to board composition and financial performance

evolve similarly prior to SB826, providing prima-facie evidence that the parallel trends assumption

is likely to hold (Table III). Table III presents estimates of the event study coefficients in Equation

1. Taken at face value, SB826 raised the female board share by 6 percentage points and reduced the

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[19]This assumption would be violated, for example, if attitudes about women in leadership trend differently in treated
manufacturing firms relative to control manufacturing firms.

share of all-male boards by 30 percentage points within one year (Cols 1 and 2). In 2019, treated firms were substantially more likely to expand the board due to the quota: Column 4 shows that the quota raised the share of companies that added a board seat by 14 pp, from a mean of 0.23.

4.1 Robustness Check: Did Firms Added Female Directors For Reasons Besides the Quota?

These estimates may understate or overstate the true effects of the gender quota. If, for example, SB826 created social pressure for firms based outside of California to gender diversify their boards, then the event study coefficients presented in Table III and visualized in Figure II would be underestimates. This would be consistent with the discussion in Von Meyerinck et al. (2019), who document that California often sets policy trends that are later adopted by other states. In contrast, SB826 adoption may be associated with attitude shifts about women in leadership that occur in California but not elsewhere. Under the "Social Change" hypothesis (Donohue and Heckman 1991; McCrary 2007), increased female board representation among treated firms would have occurred even absent SB826. In this scenario, the numbers from Table III would overestimate the true effect of SB826. However, I find little evidence for these potential biases.

To test for these effects, I re-estimate Equation 1, but further restrict the control group to firms headquartered in Democratic states – those that voted for Hillary Clinton in the 2016 election. As conjectured by Von Meyerinck et al. (2019), Democratic states are more likely to adopt gender quotas like SB826 than Republican states. Furthermore, attitudes about progressive causes are more likely to be concordant within Democratic states. As a result, if spillover effects or broad shifts in attitudes particular to Democratic states are at play, then estimates from this regression should be muted relative to those in Table III. In fact, the estimated effects of SB826 on board gender composition are *larger* when I restrict the control group to firms based in Democratic states.[20] These numbers provide evidence that the effects documented in Table III are not overestimated due

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[20]Table A1 documents that SB826 reduced the share of all-male boards by 32 pp by 2020, while Table III documents a reduction of 28 pp.

to omitted variables particular to Democratic states.

Furthermore, I find that SB826 did not shift the board composition of CA-based firms with gender-diverse boards in 2017, suggesting that my results are not driven by unobserved CA-specific shocks. If the estimated effects of the quota on board gender diversity are upward biased due to social change, then one would expect increases in female board representation among all CA companies (even those already compliant with SB826). However, CA-based firms unaffected by the quota did not change board composition in response to SB826. As evidence, the estimated effects of SB826 on the board's gender composition substantially decline when I estimate Equation 1 on the full sample of all domestic and listed firms (Col 7, Table A1).[21] This result implies that the legislation had minimal impacts of shifting the board composition of companies that were already compliant with the legislation's requirements. Figure III provides further support for this point, showing that companies with gender-diverse boards in 2017 overwhelmingly maintained gender-diverse boards in the subsequent years. Furthermore, the triple-differences point estimates fall within the 95 percent confidence interval of Table III's baseline estimates (Table A1, Col 6).[22] These results corroborate that the baseline estimates presented in Table III accurately capture the causal effects of SB826.

To summarize, firms affected by SB826 overwhelmingly responded by adding female board members. In contrast to firm responses in Norway, firms in California did not systematically delist or change headquarter location to evade the scope of SB826. Within two years, the quota raised the average share of female board members by 8 percentage points and reduced the share of all-male boards by 30 percentage points. To accommodate newly instated female board members, quota-affected firms were substantially more likely to increase the size of their board. These gains in female board representation are substantial. For context, the female board share among all

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[21]In this exercise, the treatment group consists of all CA-based and listed companies as of 2017, while the control group consists of all non-CA-based and listed companies as of 2017.

[22]The triple differences specification uses the full sample of domestic and listed firms between 2015 and 2021. It presents OLS estimates of the following equation:

$$Y_{fti} = \gamma_0 + \theta_f + \delta_{CA,t} + \psi_{AMB,t} + \beta \left(1[Year \geq 2019] \times CA\ AMB_{2017} \right) + \varepsilon_{fti} \tag{2}$$

domestic and listed companies only increased by 7 percentage points between 2010 and 2017 (Figure I). SB826 can thus be viewed as rapidly accelerating trends towards increased gender diversity on corporate boards.

5   Effects of the Quota on Financial Performance

Existing research has documented negative share price reactions to the announcement of SB826 (i.e. Greene, Intintoli, and Kahle 2020), but did compliance with the quota actually worsen financial performance? In this section, I show that within three years, the quota did not deteriorate firm profitability, values, or returns and, if anything, improved them.

California-based companies with all-male boards prior to the quota had declining Return on Assets from 2015 to 2017, having experienced an 8 percentage point reduction over the period (Figure IV). The reduction among treated firms is more substantial than the two percentage point decline experienced by control firms over the same period. However, operating performance among treated firms catches up in the three years after the quota. The same figure shows that between 2018 and 2021, average ROA among treated firms rises by 13 percentage points, compared to a 7 percentage point increase among the control group.

Consistent with the visual evidence, the difference-in-differences estimates in Table V, Row 2 indicate that the quota raised operating performance by 4.6 percentage points, with statistical significance at the 1% level. The improvements in operating performance cannot be explained by favorable economic conditions experienced by all California-based firms over the post-treatment period. The triple differences point estimates show that the quota increased ROA by 5.5 percentage points (s.e. 2.2) between 2018 and 2021 (Table V). This point estimate is economically meaningful. For context, the baseline value for ROA among treated firms is -0.30 in 2017; a 5 p.p. gain in ROA for these firms corresponds to a 17% improvement in operating performance.

I also observe that the quota had no negative impacts on financial performance when I look at Tobin's Q, a measure of a firm's value. Average Tobin's Q trends similarly between the treatment

17

and control group over the entire sample period, as shown in Figure V. Not surprisingly, I fail to reject the standard null hypothesis that the quota had a zero impact on firm value (Table III, Column 6). To increase statistical precision, I pool all the post-treatment periods in a difference-in-differences specification. Table V, Column 1 shows that SB826 increased Tobin's Q by 7%, though once again the standard null hypothesis cannot be rejected at conventional levels. It is interesting to note that an effect size of -1% falls outside the 95% confidence interval, reaffirming the conclusion that the quota did not have any substantial negative impacts on financial performance.

Similar results emerge upon considering the returns from holding a portfolio of quota-affected companies. The solid black line in Figure VI shows that one dollar invested in a market-value weighted portfolio of treated companies as of Jan 1st, 2018 would grow to $2.09 by Dec 31st 2021. In contrast, the same dollar sunk into a value-weighted portfolio of companies in the control group would grow to $1.41.[23] The superior performance by the treatment group may be compensation for greater risk faced by companies in this portfolio. Following Eckbo, Nygaard, and Thorburn (2022), I examine the parameter α in the following three-factor model to see whether treated companies experienced risk-adjusted abnormal returns:

$$r_{pt} = \alpha + \beta r_{wt} + \gamma HML_t + \lambda SMB_t + \varepsilon_{pt}, \ t = 10/1/2018, ..., 12/31/2021,$$

where r_{pt} is the daily stock return to the value-weighted portfolio in excess of the daily US Treasury bill, r_{wt} is the daily return on the US market in excess of the daily US Treasury bill, and SMB and HML are global risk factors from Ken French's website. The sample period is from October 1st, 2018 (the first trading day after the legislation's passage) through December 31st, 2021 (the end of the compliance period). I estimate the parameters of the above regression separately for four portfolios classified by headquarter location and board gender-diversity status as of 2017 (CA-All-Male-Board, CA-Gender-Diverse-Board, Non-CA-All-Male-Board, and Non-CA-Gender-Diverse-Board). Table IV presents the α estimates for the four value-weighted portfolios.

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[23]Out-performance by the treatment group is not an artifact of weighting the portfolio by market capitalization. If an investor were to purchase equally-weighted portfolios, the superior performance by the treatment group would be accentuated: a dollar invested in the treatment group grows to $2.61, versus $1.33 for the control group (Figure A3).

The α estimates are statistically-insignificant for all four groups except for the companies that have California headquarters and gender-diverse boards in 2017, which have annualized abnormal returns of $.0185 \times 252 = 4.6\%$. In the medium-run, these results are consistent with a value-neutral or positive market reaction to the gender quota.

To increase statistical precision, I consider an index of financial outcomes. As discussed by Kling, Liebman, and Katz (2007) and Hoynes, Schanzenbach, and Almond (2016), aggregating multiple outcome variables within a given domain can lower standard errors. More specifically, I construct the index by first calculating the z-scores of all the financial variables presented in Table V, and then taking an equally-weighted average.[24] The z-scores are calculated by subtracting the control group mean and dividing by the control group standard deviation, so each constituent of the index has mean 0 and standard deviation 1 for the control group. Upon considering the index, I find that SB826 modestly improved financial outcomes (Table V). The point estimate in the first cell indicates the quota increased the index of financial outcomes by 1/20th of a standard deviation, with statistical significance at the 10% level. When I add a control for firm size in Column 2, point estimates and statistical precision improve (Coefficient = 0.07, SE = 0.03).

The estimates using the overall sample mask some heterogeneity in the effects of the quota. Companies with small boards (those with below-median board size) particularly benefited from SB826. The difference-in-differences estimates show the quota raised ROA by 9 p.p and the index of financial outcomes by 1/10th of a standard deviation among these companies. Given that board expansion was a popular means of compliance, these results question whether smaller boards are necessarily optimal, as has been claimed in the literature (i.e. Yermack 1996). Companies in male-dominated industries may be especially burdened by compliance, as these industries plausibly have a limited supply of qualified director candidates.[25] These concerns do not appear well-founded, as the point estimates on the index when I restrict to male-dominated industries are positive, though statistically insignificant. Relative to the baseline analysis, the effect of SB826 on profitability is

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[24]The variables in the index include Return on Assets, Return on Equity, Log(Q), Log(Market to Book), Cash Flows, Log(Employment), and Capital Intensity.

[25]I define male-dominated industries as the SICs that have below-median female board share as of 2017.

smaller when I restrict to companies where the CEO is chairman of the board (Column 8, Table V). This result is consistent with the theory that individual directors are less influential when the CEO has control over the board. It also illustrates how the effect of gender quotas may depend on the allocation of authority within organizations, which has been shown to affect bottom-line outcomes (i.e. Bandiera et al. 2021). Overall, this section demonstrates that the quota did not adversely affect financial performance in the three years after its passage. This conclusion aligns with the results by Ferrari et al. (2022), who find that a 2011 Italian gender-quota that mandated 20% female representation had no impacts on financial performance by 2014.

6   Effects of the Quota on Board Characteristics

Given that the quota did not hurt financial performance, a natural question arises: why were all-male boards the most popular form of board structure prior to the legislation? In this section, I demonstrate that firms typically recruit candidates with top-level experience and connections to corporate leadership. Women directors, including those appointed after the quota, are less likely to possess these characteristics, which helps to explain why corporate leadership has been predominantly male.

I start by comparing the characteristics of all incoming male and female directors who start between 2015 - 2020 along three dimensions: education, experience, and connections. Even though this period is associated with gradual increases in female board representation (Figure I), Table VI shows that new male appointments still outpaced new female appointments by more than three to one. Incoming female directors are equally qualified as their male counterparts in terms of education, as proxied by MBA, Law Degree, and Ivy League attainment. In fact, incoming female directors are 2pp more likely to have a Law Degree (9% male vs 11% female). However, there do appear to be substantial gender differences in experience. Compared to incoming female directors, incoming male directors are more likely to have prior Board (83% men vs 72% women), C-Suite (70% men vs 67% women), and Same-Sector experience (55% men vs 43% women). Although

this finding is not novel (e.g. Ahern and Dittmar 2012; Hwang, Shivdasani, and Simintzi 2018), it is reassuring to observe in my sample period.

I also see that incoming male directors are substantially more likely to have employment relationships with existing company leadership than incoming female directors, contributing to a literature that investigates how workplace connection patterns affect male and female outcomes.[26] Men have a staggering 21pp advantage in having prior connections with the incumbent board and C-Suite. Further, 95 percent of incoming female directors are Non-Executive directors (compared to 82 percent of male directors), resonating with the theme that female directors are predominantly "outsiders." While not definitive, these numbers do hint that path dependence contributes to gender disparities in board membership: men are more likely to hold leadership positions, begetting connections to other company leaders, which in turn generate more leadership positions.

The quota reduced the share of the board with prior top-level experience and connections with leadership, consistent with underlying differences between the typical male and female director over the sample period. I use Equation 1 to evaluate how the quota shifted the characteristics of the boardroom. By 2020, SB826 reduced the share of the board with prior board and c-suite experience by three percentage points (Table VII, Cols 4-5). These reductions are driven by the fact that treated firms were substantially more likely to add female directors than control firms, as the incidence of top-level experience among incoming female directors is comparable across firms in the treatment and control group (Table VIII). Interestingly, SB826 did not reduce the share of the board with prior same-sector experience. This result implies that many of the women who did break the "Glass Ceiling" came from the same sector as the treated firms. Perhaps the most interesting effect of SB826 was its influence in promoting directors without prior employment connections onto corporate boards. By 2020, the quota lowered the proportion of directors with prior employment connections to the board by 3 percentage points (Column 7 of Table VII). When

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[26]Essen and Smith (2022) find evidence of the "Old Boys Network" in the Danish board context, who show that gendered connection patterns increase the likelihood that male candidates achieve board positions. Similarly, Cullen and Perez-Truglia (2023) show that gendered connection patterns advantage males in the promotion process. Kunze and Miller (2017) find that increased female representation in corporate leadership may benefit women in lower ranks, but not women within the same rank.

I consider the incidences of a prior board-board or same-gender connection, this number rises to 3.3 p.p and 5.3 p.p respectively (Cols 8, 10). These figures further validate the claim that the quota promoted "outsiders" onto corporate boards.

Although quota-appointed directors have less top-level experience, they do not appear less-qualified or influential on corporate boards. As demonstrated in the previous section, financial outcomes did not decline in response to SB826; this finding rejects the hypothesis that the quota would coerce firms to add directors who reduce measures of financial performance. For more granular evidence at the director-level, I observe that 210 female directors filled 214 vacancies, indicating that treated firms pulled from a diverse array of board candidates (Table VIII). Table A5 provides additional support for the theory that firms had many qualified candidates from which to choose, as the number of women with top-level experience far exceeds the number of treated firms in most industries. Further, I find that quota-appointed directors play similar roles on the board as their peers. The difference-in-differences estimates presented in Table V, Panel II show that there are no reductions in the share of the board on the compensation or nominating committees. There is one exception – the quota lowered the share of the board on the audit committee, especially among firms in male-dominated industries. This result indicates that quota-appointed directors were not immediately assigned the most important responsibilities on corporate boards.

7   Conclusion

In this paper, I show that SB826, which mandated at least one woman onto corporate boards by the end of 2019, successfully introduced gender diversity without reducing financial performance. Within two years, the legislation increased women's share on corporate boards by 7 percentage points, which corresponds to the entire gain in female board representation between 2010 and 2017. My results should not be taken to imply that quotas are a panacea for addressing the lack of diverse representation in leadership. Many firms might have added female representation even absent the quota. I document that firms add gender diversity onto the boardroom as they age, so

the quota can be interpreted as accelerating a natural process.

Nevertheless, proponents of active governmental intervention to address inequalities may rejoice in this paper's findings. The quota created a pathway for women to enter corporate leadership without harming performance. But this result poses somewhat of a puzzle: why didn't the shareholders of quota-affected companies adopt gender-diverse boards prior to the legislation? This paper provides support for the theory that some capable women do not reach the top because they are not connected to incumbent male leadership. Employment connections develop through work experience, so it may not be entirely surprising that the quota also lowered the share of the board with prior board and c-suite experiences. The quota increased firm outreach efforts while maintaining bottom-line outcomes, in much the same way that some universal school outreach programs have improved minority representation while maintaining student-level outcomes (Card and Giuliano 2016).

The results of this paper may not be very surprising to some readers. The quota imposed a relatively minor requirement that one woman be on the corporate board. Firms complied with this low bar, and there do not appear to be any adverse consequences of eliminating all-male boards within three years. However, the quota may generate externalities that take years to materialize. A promising avenue for future research would be examine whether the quota created gains for women that were not mandated by the legislation. It would be worthwhile to follow-up in the upcoming years to study whether quota-affected firms continued to recruit women or if the first-time female directors appointed after SB826 earned additional corporate leadership positions. For the more immediate present, socially conscious investors and policy-makers can take home the message that moderate pressures to increase diversity can be good for business and minority representation.

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Figure I

Female Board Share Versus Female Share of MBA graduates
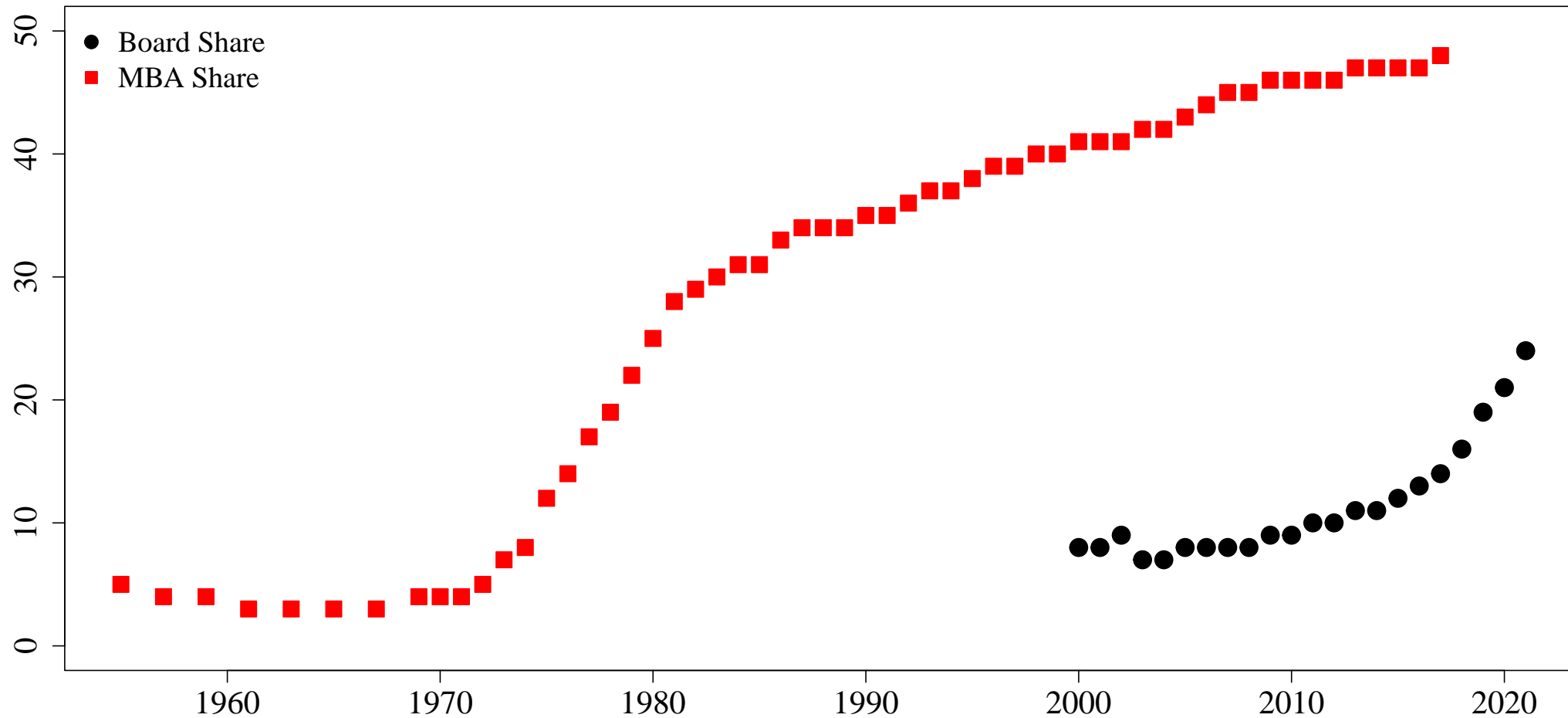
Note: The female share of MBA graduates is taken from NCES Table 325.25, which tracks postsecondary institutions participating in Title IV federal financial aid programs. The annual female board share of domestic and listed companies is derived from BoardEx's Organizational Summary files.

Figure II

Event Study Coefficients:
SB826 Dramatically Reduced the Share of Companies With All−Male Boards
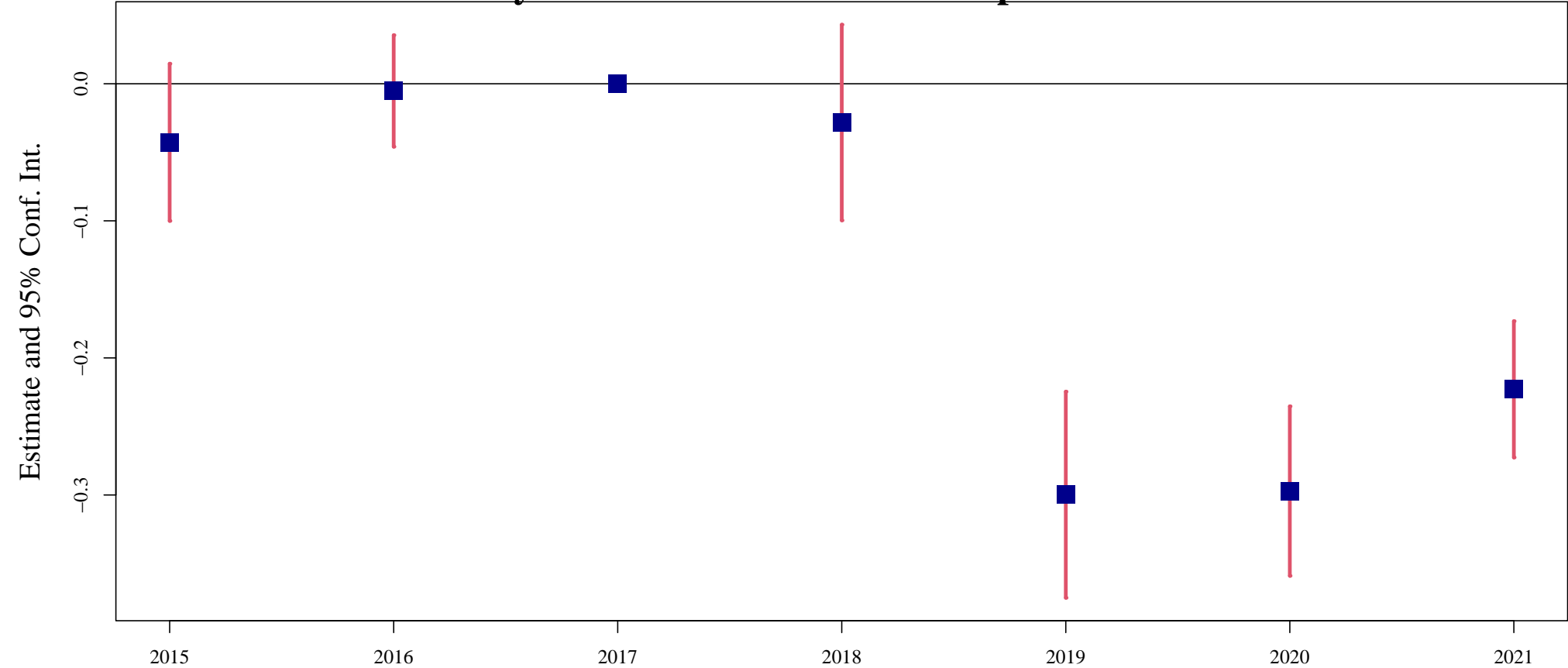
Note: The sample restricts to an unbalanced panel of firms that were domestic, listed, and had
all−male boards in 2017. The time period covered is 2015 − 2021, with reported effects relative to
the 2017 baseline. Standard errors are clustered at the firm level.

Figure III

Share of Companies with All Male Corporate Boards
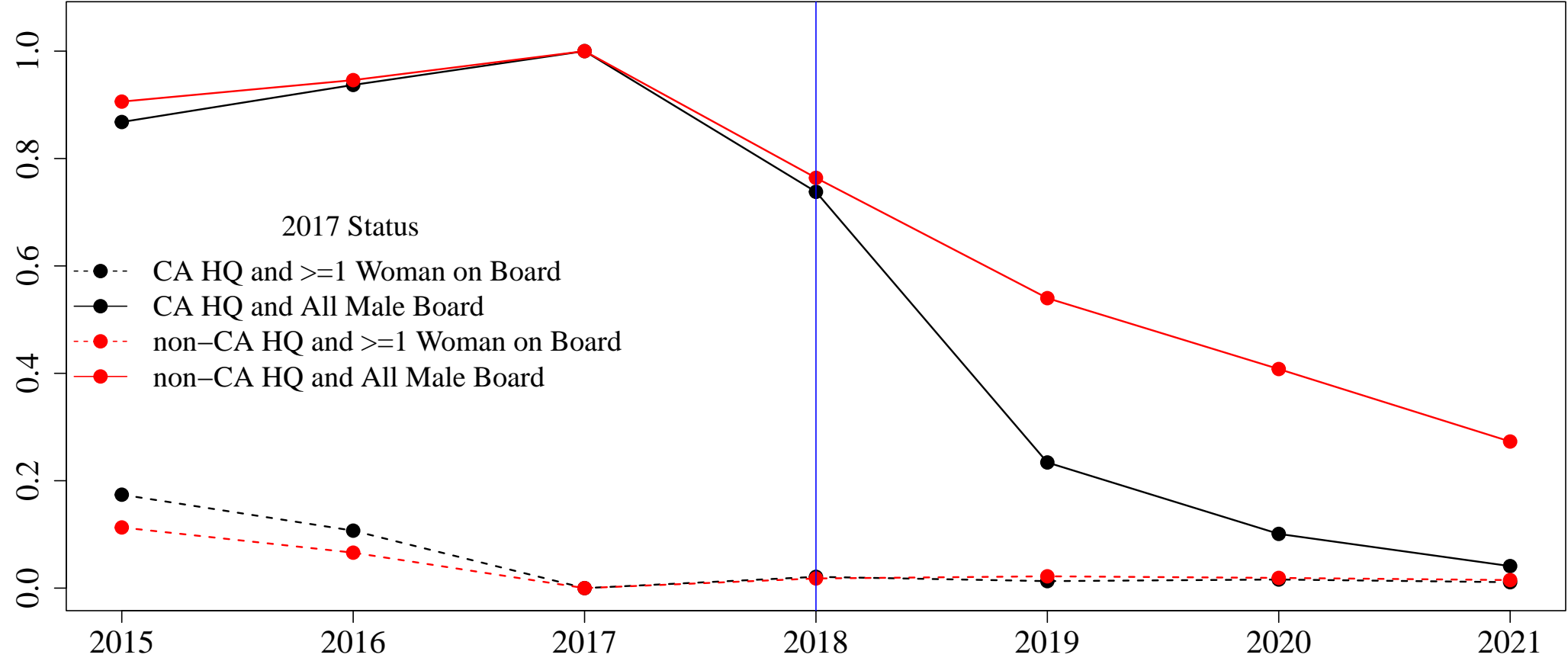
Notes: CA SB 826, approved on 9/30/2018, mandated at least 1 woman be on the corporate board of any listed company with HQ in CA by 12/31/2019. Listed companies have shares listed on the NASDAQ, NYSE, or NYSE American. The sample tracks an unbalanced panel of firms that were domestic and listed in 2017, the year before SB 826 was signed.

Figure IV

Average Return on Assets by Treatment Group
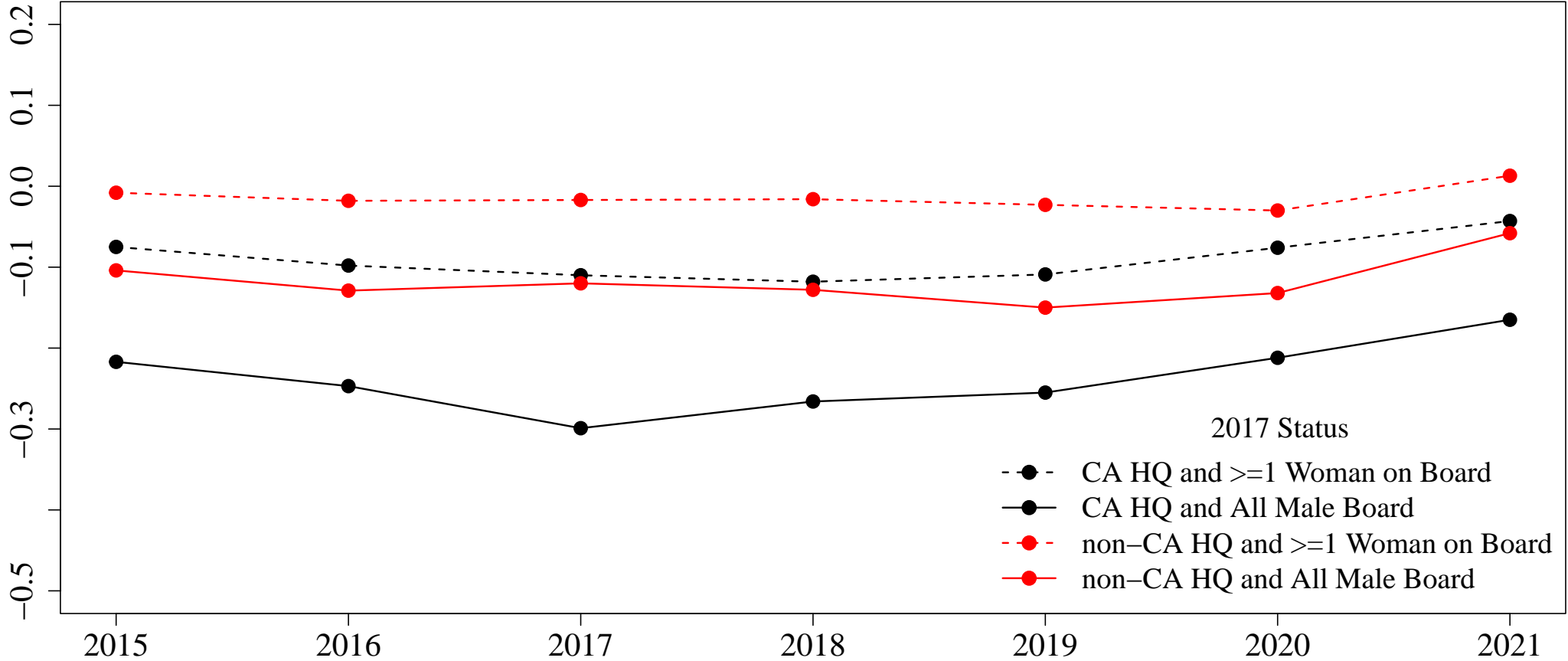
2017 Status
- - ● - - CA HQ and >=1 Woman on Board
——●—— CA HQ and All Male Board
- - ● - - non−CA HQ and >=1 Woman on Board
——●—— non−CA HQ and All Male Board

Notes: CA SB 826, approved on 9/30/2018, mandated at least 1 woman be on the corporate board of any listed company with HQ in CA by 12/31/2019. Listed companies have shares listed on the NASDAQ, NYSE, or NYSE American. The sample tracks an unbalanced panel of firms that were domestic and listed in 2017, the year before SB 826 was signed. Return on Assets is Net Income before Extraordinary Items and Discontinued Operations divided by Book Assets, and is winsorized at the 1st and 99th percentiles of the sample.

Figure V

Average Tobin's Q by Treatment Group
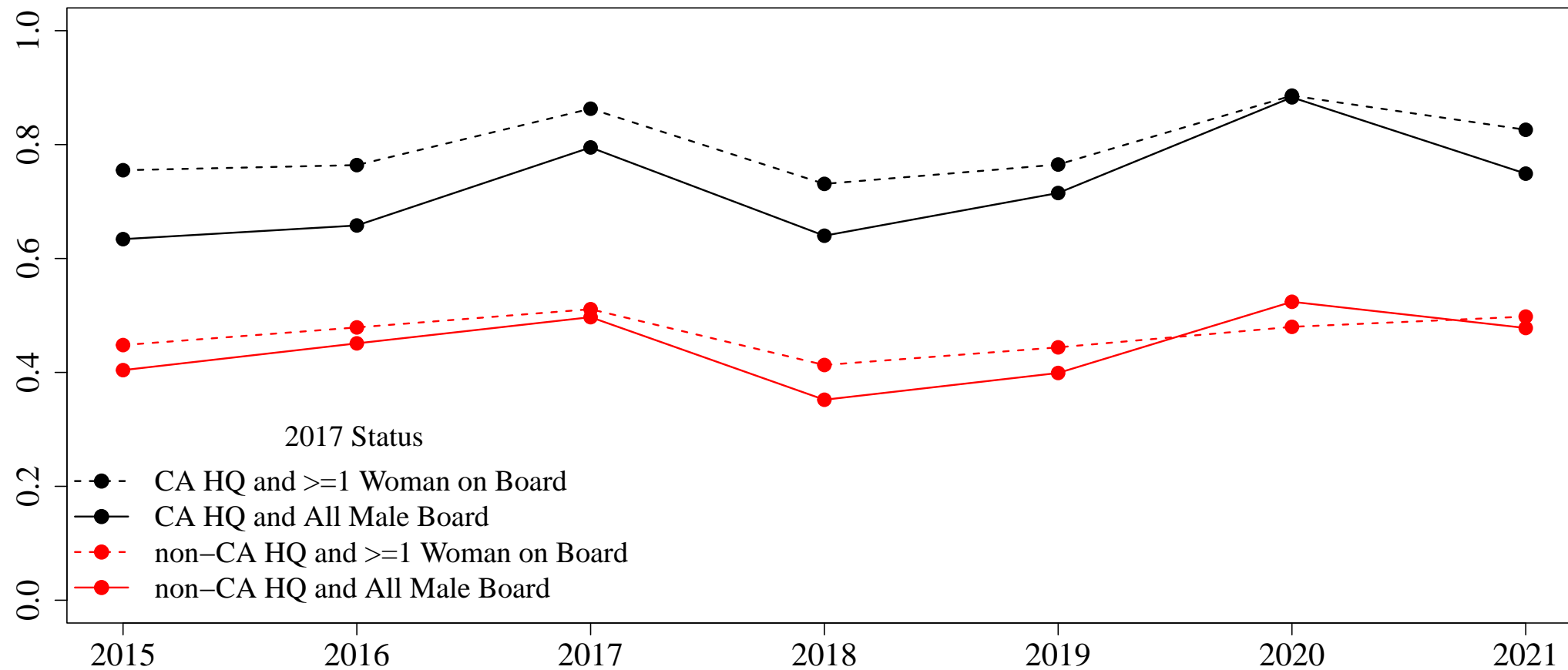
2017 Status
- - ● - - CA HQ and >=1 Woman on Board
——●—— CA HQ and All Male Board
- - ● - - non−CA HQ and >=1 Woman on Board
——●—— non−CA HQ and All Male Board

Notes: CA SB 826, approved on 9/30/2018, mandated at least 1 woman be on the corporate board of any listed company with HQ in CA by 12/31/2019. Listed companies have shares listed on the NASDAQ, NYSE, or NYSE American. The sample tracks an unbalanced panel of firms that were domestic and listed in 2017, the year before SB 826 was signed. Tobin's Q is the ratio of the firm's market value to its book value of assets, and is log transformed.

Figure VI

Value–Weighted Buy and Hold Returns
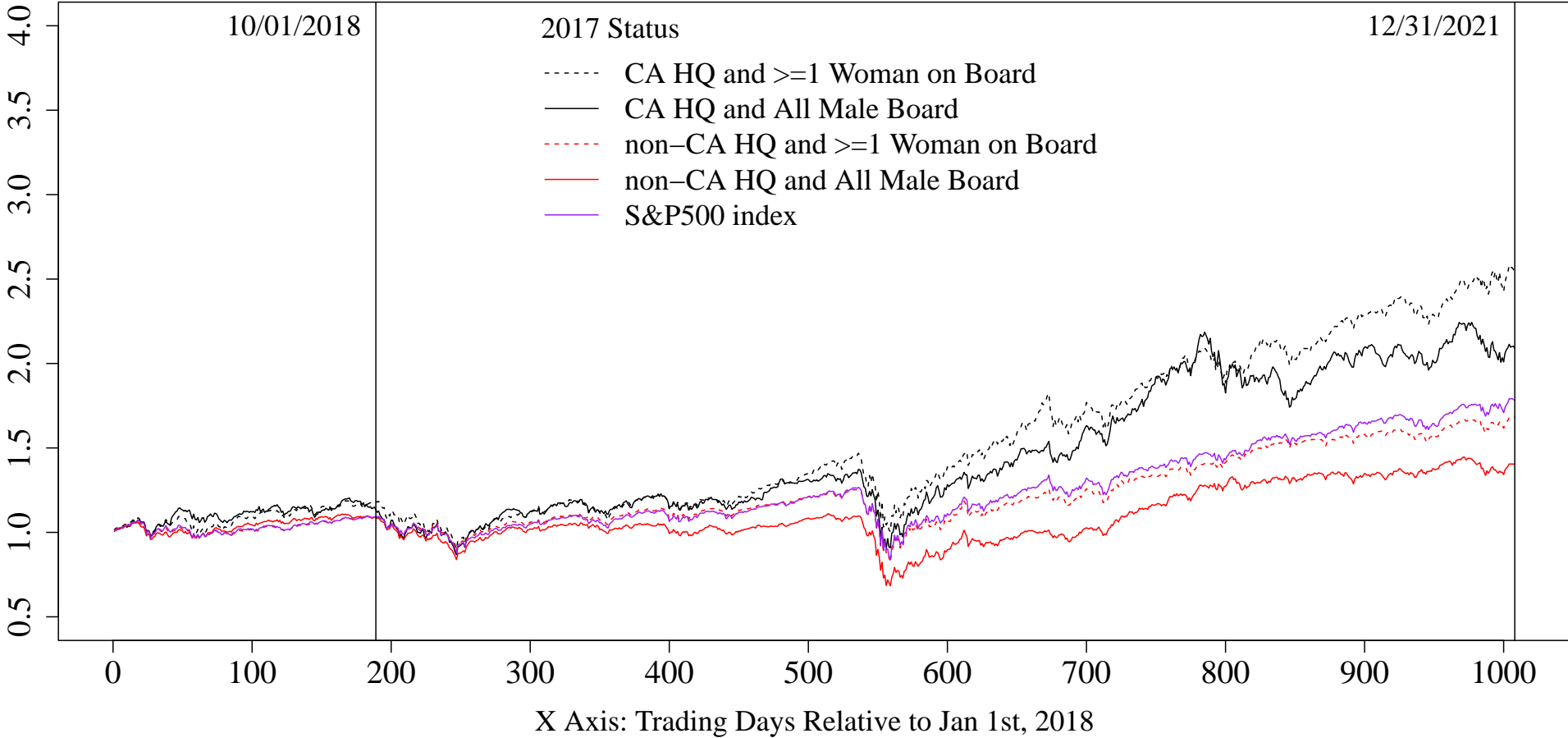
X Axis: Trading Days Relative to Jan 1st, 2018

Note: The sample tracks an unbalanced panel of firms that were domestic and listed in 2017, the year before SB826 was signed. Firms that delist and have missing delisting returns, or do not delist and have missing returns, are dropped. Company specific buy–and–hold–returns are weighted by market value as of Jan 1st, 2018. Monday October 1st was the first trading day after the legislation's passage. Daily security returns are provided by CRSP. Among companies with multiple securities, I choose the security with the highest average trading volume between Jan 2nd, 2015 and March 31st, 2022.

Figure A1: Example Director Profile in SEC 10-K Reports

Wanda M. Austin

Retired President and Chief Executive Officer, The Aerospace Corporation

Age: 66
Director Since: December 2016
Independent: Yes

Chevron Committees:
- Board Nominating and Governance
- Public Policy and Sustainability (Chair)

Current Public Company Directorships:
- Amgen Inc.
- Virgin Galactic Holdings, Inc.

Prior Public Company Directorships
(within last five years):
- None

Other Directorships and Memberships:
- Horatio Alger Association
- National Academy of Engineering
- University of Southern California (transitions to Life Trustee as of May 15, 2021)

Dr. Austin has held an adjunct Research Professor appointment at the University of Southern California's Viterbi School's Department of Industrial and Systems Engineering since 2007. She has been Co-founder and Chief Executive Officer of MakingSpace, Inc., a leadership and STEM (science, technology, engineering, and math) consulting firm, since December 2017. She is a World 50 executive advisor, fostering peer-to-peer discussions among senior executives from some of the world's largest companies. She served as Interim President of the University of Southern California from August 2018 until July 2019. She served as President and Chief Executive Officer of The Aerospace Corporation ("Aerospace"), a leading architect for the United States' national security space programs, from 2008 until her retirement in 2016. From 2004 to 2007, she was Senior Vice President, National Systems Group, at Aerospace. Dr. Austin joined Aerospace in 1979.

skills and qualifications

Business Leadership / Operations: Eight years as CEO of Aerospace. Thirty-seven-year career with Aerospace included numerous senior management and executive positions. CEO of MakingSpace, Inc., since December 2017.

Finance: More than a decade of financial responsibility and experience at Aerospace. Audit Committee member at Amgen Inc.

Global Business / International Affairs: Internationally recognized for her work in satellite and payload system acquisition, systems engineering, and system simulation. Former CEO of a company that provides space systems expertise to international organizations. Director of companies with international operations.

Government / Regulatory / Public Policy: Served on the President's Council of Advisors on Science and Technology and the President's Review of U.S. Human Space Flight Plans Committee. Appointed to the Defense Policy Board, the Defense Science Board, and the NASA Advisory Council.

Science / Technology / Engineering: Ph.D. in Industrial and Systems Engineering from the University of Southern California, Master of Science in both Systems Engineering and Mathematics from the University of Pittsburgh. Thirty-seven-year career in national security space programs. Director at Amgen Inc., a biotechnology company, and Virgin Galactic Holdings, Inc., the world's first commercial space line and vertically integrated aerospace company. Fellow of the American Institute of Aeronautics and Astronautics. Member of the National Academy of Engineering.

Research / Academia: Adjunct Research Professor at the University of Southern California's Viterbi School of Engineering. Former Interim President of the University of Southern California.

Figure A2

Older Firms Have Larger and More Diverse Boards
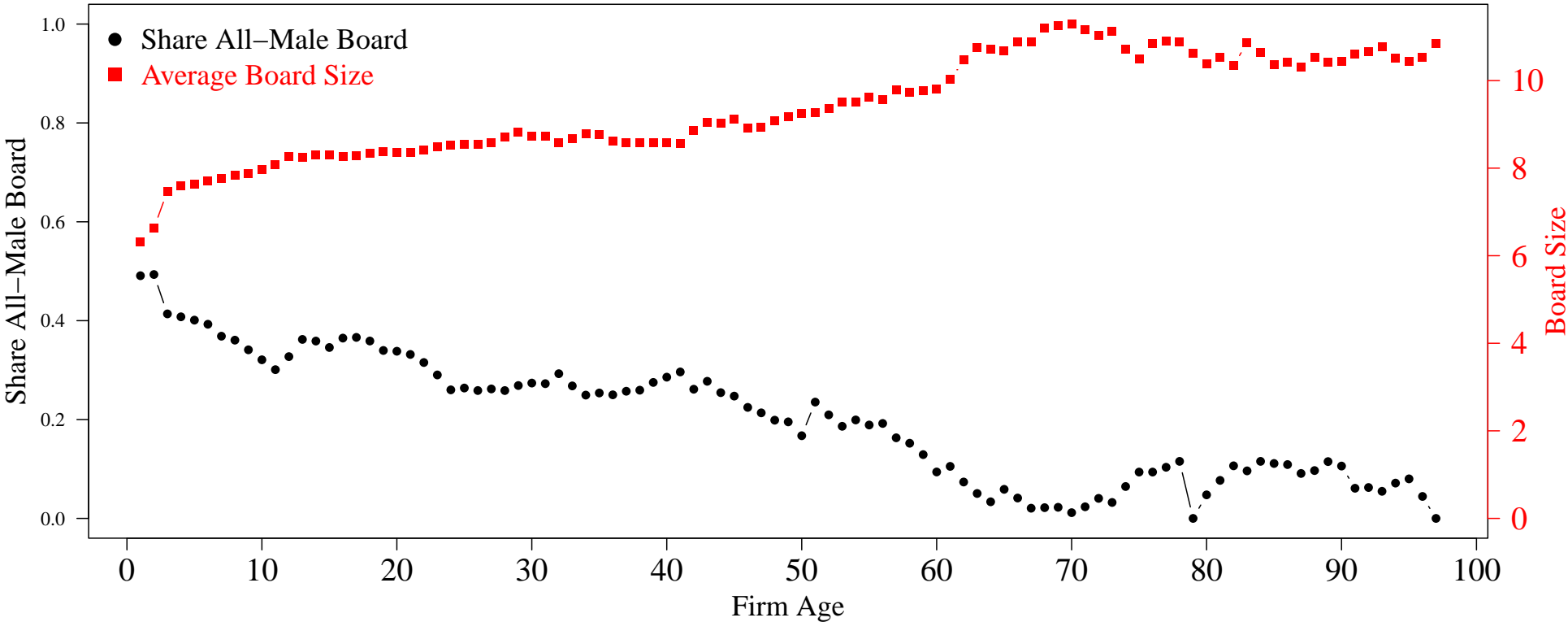
Note: The sample restricts to all domestic and listed companies observed between 2010 and 2021. The column variables are derived from Boardex's Organizational Summary files. I follow Loderer and Waelchli (2010) in constructing firm age. It is the earliest of the following: (a) the year in which the firm appears on CRSP; (b) the year in which the firm is included in COMPUSTAT; and (c) the year for which there is a link between CRSP and COMPUSTAT.

Figure A3

Equally−Weighted Buy and Hold Returns
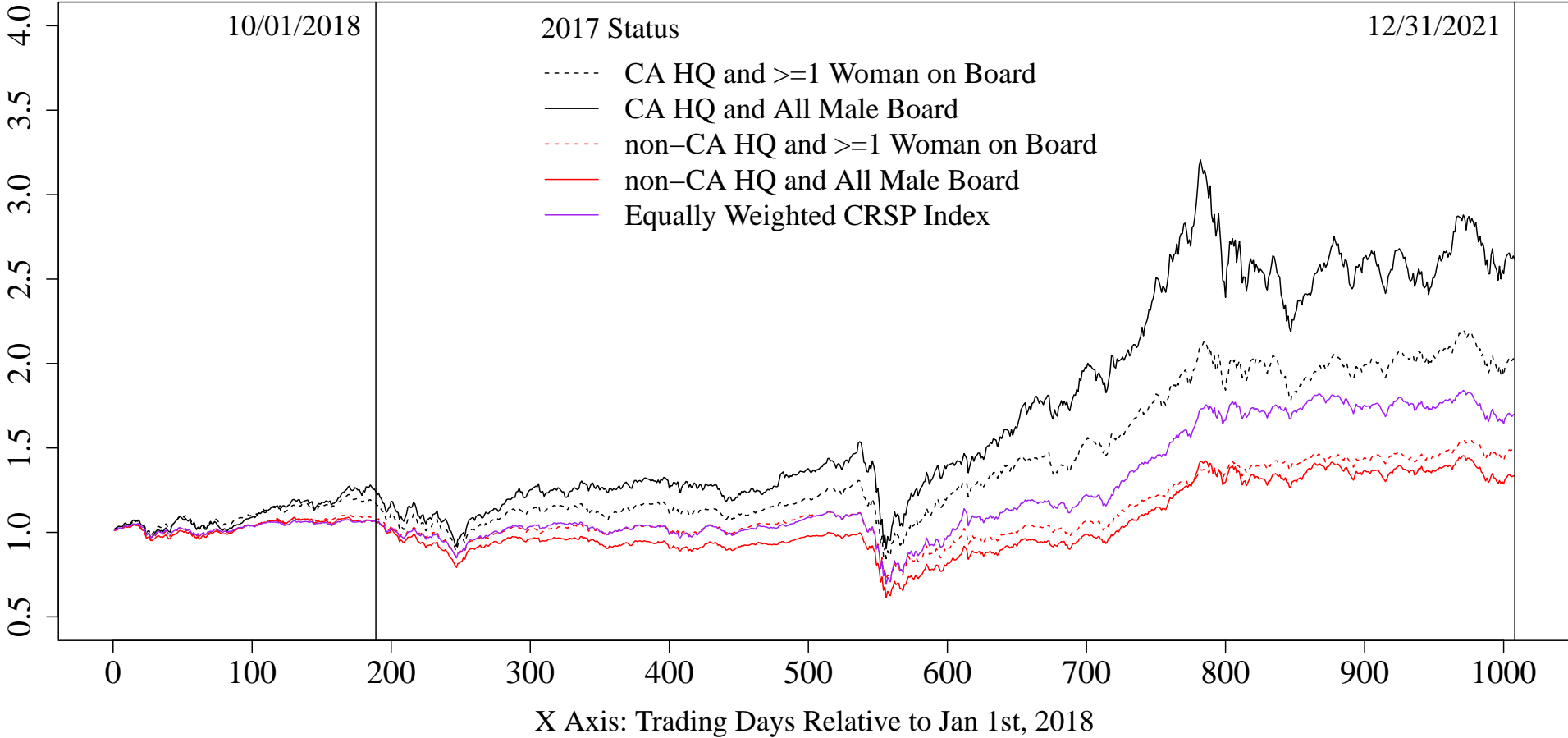
10/01/2018   2017 Status   12/31/2021

- - - - -   CA HQ and >=1 Woman on Board
————   CA HQ and All Male Board
- - - - -   non−CA HQ and >=1 Woman on Board
————   non−CA HQ and All Male Board
————   Equally Weighted CRSP Index

X Axis: Trading Days Relative to Jan 1st, 2018

Note: The sample tracks an unbalanced panel of firms that were domestic and listed in 2017, the year before SB826 was signed. Firms that delist and have missing delisting returns, or do not delist and have missing returns, are dropped. Company specific buy−and−hold−returns are equally weighted. Monday October 1st was the first trading day after the legislation's passage. Daily security returns are provided by CRSP. Among companies with multiple securities, I choose the security with the highest average trading volume between Jan 2nd, 2015 and March 31st, 2022.

Table I: Sample Size

Year	N: All Firms	HQ in CA			HQ outside of CA		
		N	N: AMB	Pr(AMB)	N	N: AMB	Pr(AMB)
2015	4013	664	266	0.40	3349	1134	0.34
2016	3872	647	242	0.37	3225	1021	0.32
2017	3845	644	204	0.32	3201	942	0.29
2018	3817	658	166	0.25	3159	760	0.24
2019	3795	671	59	0.09	3124	582	0.19
2020	3861	702	24	0.03	3159	475	0.15
2021	3977	772	12	0.02	3205	314	0.10

Note:

The sample restricts to domestic and listed companies that report board gender and headquarter location. The annual gender composition of corporate boards is provided by BoardEx and reflects the board's composition as of the company's annual report date. Headquarter location is triangulated from Compustat Snapshot, BoardEx, and SEC filings. The universe of listed companies is derived from CRSP. "AMB" refers to companies with All-Male Boards. CA's SB826, approved on 9/30/2018, mandated at least 1 woman be on the corporate board of any listed with HQ in CA by 12/31/2019.

Table II: Firm Characteristics in 2017

	CA-HQ	Outside CA-HQ	Diff	P-Value	N: CA-HQ	N: Outside CA-HQ
Boardroom Characteristics						
Board Size	6.38	6.75	-0.37	0.00	204	943
Dual CEO/Chairman Role	0.38	0.37	0.00	0.93	204	943
Director Age	61.00	61.64	-0.64	0.15	204	942
MBA Degree	0.39	0.34	0.05	0.01	204	941
Prior Board Experience	0.81	0.77	0.04	0.03	204	942
Prior C-Suite Experience	0.69	0.61	0.08	0.00	204	942
Prior Same Sector Experience	0.51	0.44	0.07	0.01	204	942
Prior Conx w/Board	0.57	0.54	0.03	0.23	204	941
Prior Board Conx w/Board	0.41	0.38	0.03	0.27	204	941
Prior Conx w/ C-Suite	0.49	0.43	0.05	0.03	204	940
Prior Same Gender Conx w/Board	0.56	0.54	0.03	0.22	204	941
Non-Executive Director	0.78	0.80	-0.02	0.04	204	943
Firm Characteristics						
Age	16.07	19.21	-3.14	0.00	202	942
Employees (k)	0.79	1.99	-1.19	0.00	193	875
Return on Assets	-0.30	-0.12	-0.18	0.00	194	895
Log(Tobin's Q)	0.82	0.55	0.28	0.00	188	870
Log(Market Value)	5.37	5.54	-0.16	0.23	189	874
Company Policies						
1(Delist)	0.02	0.01	0.01	0.23	204	943
1(Merger or Reorg)	0.00	0.00	0.00	0.90	204	943
1(Dividend)	0.14	0.36	-0.22	0.00	204	943
1(Incr in Shares Outstanding $\geq$ 5 percent)	0.04	0.04	-0.01	0.73	204	943
1(Decr in Shares Outstanding $\geq$ 5 percent)	0.06	0.07	-0.01	0.74	204	943
Committee Composition						
Avg Committee Load	2.90	2.72	0.17	0.02	203	939
Audit Share	0.73	0.73	0.00	0.79	203	939
Compensation Share	0.69	0.66	0.03	0.06	203	939
Nominating Share	0.63	0.58	0.06	0.01	203	939
Other Share	0.03	0.05	-0.02	0.00	203	939

Table II: Firm Characteristics in 2017 *(continued)*

	CA-HQ	Outside CA-HQ	Diff	P-Value	N: CA-HQ	N: Outside CA-HQ
Industry Composition						
Agriculture, Forestry and Fishing	0.00	0.00	0.00	0.59	204	943
Construction	0.00	0.01	-0.01	0.34	204	943
Finance, Insurance and Real Estate	0.08	0.18	-0.10	0.00	204	943
Manufacturing	0.34	0.26	0.08	0.02	204	943
Mining	0.01	0.09	-0.08	0.00	204	943
Non-Classified	0.34	0.23	0.12	0.00	204	943
Retail Trade	0.01	0.03	-0.02	0.06	204	943
Services	0.16	0.12	0.04	0.14	204	943
Transportation, Communications, Electric, Gas and Sanitary service	0.02	0.06	-0.04	0.01	204	943
Wholesale Trade	0.02	0.03	-0.01	0.53	204	943

Note:
The sample restricts to firm-year observations in 2017 and selects companies that were domestic, listed, and had an all-male board. Sample sizes differ across rows due to missing values. Raw means and p-values from a two sided t-test reported. Boardroom characteristics are derived from BoardEx and represent mean values in 2017. Financial variables are derived from Compustat's annual fundamental files, and are either log transformed or winsorized at the 1st and 99th percentiles. The percentiles are calculated relative to all domestic and listed companies observed in the 2017. Tobin's q is the ratio of the firm's market value to its book value of assets. Market value is book assets plus book equity minus market value of equity. ROA is net income before extraordinary items and discontinued operations divided by book assets. All company policy variables are derived from CRSP's events files. A company delists if none of the company's securities are listed the subsequent year. All other company policies indicate if the event occured for some security during the calendar year, and are derived from CRSP's Events files. Committee membership is derived from Boardex's Committee files. The first row represents the average (over all companies) of the mean committee load within a company. The remaining rows in the section represent the average (over all companies) share of directors that serve on a given committee. Industries are categorized into 11 divisions using the 4 digit SIC code, following OSHA's crosswalk. SIC codes are derived from CRSP's Names files.

Table III: Effects of the Gender Quota on Board Composition

Dependent Variables: Model:	Male Share of Board (1)	1(All-Male Board) (2)	Board Size (3)	1(Expand Board) (4)	1(Male Dropped) (5)
Variables					
$CA_{2017} \times$ Year $= 2015$	-0.007	-0.043	0.114	-0.036	0.046
	(0.005)	(0.029)	(0.108)	(0.050)	(0.056)
$CA_{2017} \times$ Year $= 2016$	-0.0007	-0.005	0.050	-0.043	-0.009
	(0.003)	(0.021)	(0.084)	(0.045)	(0.053)
$CA_{2017} \times$ Year $= 2018$	-0.006	-0.028	0.060	0.037	0.025
	(0.006)	(0.036)	(0.087)	(0.055)	(0.055)
$CA_{2017} \times$ Year $= 2019$	-0.056***	-0.300***	0.223**	0.135***	-0.004
	(0.008)	(0.038)	(0.112)	(0.052)	(0.056)
$CA_{2017} \times$ Year $= 2020$	-0.078***	-0.298***	0.172	-0.024	0.055
	(0.008)	(0.032)	(0.124)	(0.051)	(0.060)
$CA_{2017} \times$ Year $= 2021$	-0.106***	-0.239***	0.311**	0.064	-0.018
	(0.010)	(0.025)	(0.135)	(0.054)	(0.060)
Fixed-effects					
Firm	Yes	Yes	Yes	Yes	Yes
Year-SIC	Yes	Yes	Yes	Yes	Yes
Fit statistics					
Observations	6,910	6,910	6,910	6,670	6,670
Dependent variable mean	0.945	0.692	6.90	0.228	0.414
Number of Firms	1,146	1,146	1,146	1,139	1,139

Clustered (Firm) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

The sample restricts to an unbalanced panel of firms that were domestic, listed, and had all-male boards in 2017. The time period covered is 2015 - 2021, with reported effects relative to the 2017 baseline. Standard errors are clustered at the firm level. Treated firms have CA headquarters and all-male boards as of 2017. The 'Expand Board' indicator equals one if board size increases relative to the prior year. 'Male Dropped' equals 1 if some male director present in the previous year is not present in the current year. Outcome variables related to board composition are derived from BoardEx's organizational summary files, which provides the director roster as of the company's annual report date. Industries are categorized into 11 divisions using the 4 digit SIC code, following OSHA's crosswalk. SIC codes are derived from CRSP's Names files. Sample sizes vary due to missing values of the outcome variable. CA SB 826, approved on 9/30/2018, mandated at least 1 woman be on the corporate board of any listed with HQ in CA by 12/31/2019.

Table IV: Medium-Run Abnormal Performance of Portfolios Classified by Female Representation and Headquarter Status

	CA AMB	CA Gender Diverse Board	non-CA AMB	non-CA Gender Diverse Board
Model:	(1)	(2)	(3)	(4)
Variables				
α	0.0235	0.0155	0.0164	0.0065
	(0.0176)	(0.0102)	(0.0188)	(0.0071)
β_{MKT}	1.053***	1.111***	1.023***	0.9583***
	(0.0129)	(0.0075)	(0.0138)	(0.0052)
β_{HML}	-0.2498***	-0.1356***	0.4407***	0.3122***
	(0.0226)	(0.0131)	(0.0242)	(0.0091)
β_{SMB}	0.7170***	-0.0053	0.5752***	0.0406***
	(0.0260)	(0.0150)	(0.0278)	(0.0105)
β_{RMW}	-0.2999***	0.1227***	-0.1482***	0.0634***
	(0.0378)	(0.0219)	(0.0404)	(0.0152)
β_{CMA}	-0.2006***	-0.0735**	-0.2623***	-0.0578***
	(0.0499)	(0.0289)	(0.0534)	(0.0201)
Fit statistics				
Observations	820	820	820	820
Dependent variable mean	0.0897	0.1019	0.0702	0.0696
R^2	0.9249	0.9684	0.9214	0.9820

IID standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

The table reports daily abnormal stock returns for portfolios classified by female representation and headquarter status, both measured as of 2017. The sample period is from October 1st, 2018 (first trading day after the legislation's passage) through December 31st, 2021 (end of the compliance period). The abnormal stock return is estimated using the following five-factor return generating process:

$$r_{pt} = \alpha + \beta_{MKT}r_{wt} + \beta_{HML}HML_t + \beta_{SMB}SMB_t + \beta_{RMW}RMW_t + \beta_{CMA}CMA_t + \epsilon_{pt}, t = 10/1/2018, ..., 12/31/2021,$$

where r_{pt} is the daily stock return to the value-weighted portfolio in excess of the daily US Treasury bill. r_{wt} is the daily return on the US market in excess of the daily US Treasury bill. SMB, HML, RMW, and CMA are daily US risk factors from Ken French's website. To avoid survivorship bias, portfolio returns include the returns for all companies (including delisting returns where applicable) that delist during the sample period.

Table V: Effects of the Gender Quota on Financial Performance and Corporate Governance

	Baseline	Size Control	Small Brd	Male Industry	Triple Diff
Financial Outcomes					
Index of Financial Outcomes	0.063 (0.039)	0.083 (0.036)	0.131 (0.050)	0.046 (0.051)	0.087 (0.046)
ROA	0.046 (0.022)	0.040 (0.021)	0.090 (0.034)	0.040 (0.028)	0.055 (0.022)
ROE	0.072 (0.074)	0.067 (0.073)	0.139 (0.112)	0.083 (0.097)	0.083 (0.073)
Log(Q)	0.071 (0.041)	0.070 (0.041)	0.086 (0.063)	0.074 (0.051)	0.065 (0.041)
Log(Market to Book)	0.099 (0.065)	0.097 (0.065)	0.147 (0.087)	0.118 (0.083)	0.102 (0.066)
Cash Flow	0.045 (0.022)	0.040 (0.021)	0.090 (0.035)	0.038 (0.028)	0.054 (0.022)
Committee Composition					
Audit Share	-0.019 (0.012)	-0.024 (0.012)	-0.026 (0.018)	-0.035 (0.015)	-0.024 (0.012)
Compensation Share	-0.001 (0.012)	-0.002 (0.012)	0.002 (0.018)	-0.013 (0.014)	-0.004 (0.012)
Nominating Share	-0.007 (0.014)	-0.009 (0.014)	-0.033 (0.021)	-0.010 (0.017)	-0.007 (0.014)
Other Share	-0.008 (0.006)	-0.008 (0.006)	-0.002 (0.006)	0.000 (0.006)	-0.006 (0.005)
Avg. Committee Load	-0.062 (0.054)	-0.085 (0.052)	-0.068 (0.083)	-0.028 (0.070)	-0.071 (0.055)
Company Policy					
1(Delist)	0.001 (0.002)	-0.001 (0.001)	-0.003 (0.002)	-0.002 (0.001)	0.001 (0.014)
1(Merger or Reorg)	-0.001 (0.001)	-0.000 (0.000)	-0.000 (0.000)	-0.001 (0.001)	0.003 (0.010)
1(Dividend Issued)	0.011 (0.016)	0.005 (0.016)	0.011 (0.021)	0.011 (0.017)	0.017 (0.015)
1(Shares Outstanding Dcr by $\geq 5\%$)	0.029 (0.016)	0.029 (0.017)	0.022 (0.023)	0.025 (0.021)	0.020 (0.014)
1(Shares Outstanding Inr by $\geq 5\%$)	0.007 (0.018)	0.003 (0.018)	0.003 (0.026)	0.000 (0.023)	-0.004 (0.016)

Table VI: Characteristics of Incoming Directors by Gender

	Male	Female	Difference	P Value
Age & Education				
Age	57.03	56.07	0.96	0.00
MBA Degree	0.38	0.38	0.00	0.83
Ivy League Degree	0.27	0.27	0.00	0.91
Law Degree	0.10	0.12	-0.02	0.00
Experience				
Prior Board Experience	0.83	0.72	0.11	0.00
Prior C-Suite Experience	0.70	0.67	0.03	0.00
Prior Same Sector Experience	0.55	0.43	0.12	0.00
Connections				
Prior Connection to Incumbent Board	0.61	0.39	0.21	0.00
Prior Board Connection with Incumbent Board	0.41	0.19	0.22	0.00
Prior Connections to the C-Suite	0.50	0.28	0.22	0.00
Prior Same Gender Connection to Incumbent Board	0.59	0.14	0.45	0.00
Non-Executive Director	0.82	0.95	-0.13	0.00
Sample Size				
Number of Positions	20412	6492		
Number of Directors	16434	4896		
Number of Companies	4516	3581		

Note:
The sample restricts to all incoming directors within domestic and listed companies. The time period considered is 2015 - 2020. Raw means and p-values from a two sided t-test reported. Observable characteristics of incoming directors at the time the boardship begins are derived from BoardEx. Age and education derived from director profile files, experience via employment history files, and connections through the network files. Two directors have a prior connection if they overlapped at a previous company. Sectoral classification following the FTSE International standard is provided by BoardEx; see Table A5 for the full list of sectors. Experience and connections gained through work spells in non-listed companies are counted.

Table VII: Effects of the Gender Quota on Boardroom Characteristics

Dependent Variables:	Demographics			Experience			Connections				
	Age	Male	MBA	Brd Exp	C-Suite Exp	Sector Exp	Brd Conx	Brd-Brd Conx	C-Suite Conx	Same Gender Brd Conx	Non-Exec Dir.
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Variables											
$CA_{2017} \times$ Year = 2015	0.231	-0.007	-0.005	0.013	-0.002	0.007	0.004	0.013	-0.004	0.001	0.013*
	(0.285)	(0.005)	(0.012)	(0.010)	(0.011)	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.007)
$CA_{2017} \times$ Year = 2016	-0.039	-0.0007	0.003	0.006	0.003	0.005	-0.006	-0.004	-0.007	-0.005	0.003
	(0.196)	(0.003)	(0.009)	(0.006)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)	(0.006)
$CA_{2017} \times$ Year = 2018	0.035	-0.007	-0.011	-0.004	-0.006	0.016*	-0.015	-0.002	-0.014	-0.022*	0.010*
	(0.179)	(0.006)	(0.009)	(0.008)	(0.009)	(0.009)	(0.012)	(0.010)	(0.010)	(0.011)	(0.006)
$CA_{2017} \times$ Year = 2019	-0.175	-0.056***	-0.015	-0.025**	-0.023*	0.003	-0.028*	-0.024*	-0.023	-0.049***	0.013*
	(0.249)	(0.008)	(0.012)	(0.012)	(0.012)	(0.012)	(0.014)	(0.013)	(0.014)	(0.013)	(0.007)
$CA_{2017} \times$ Year = 2020	-0.111	-0.078***	-0.022	-0.033**	-0.029**	0.010	-0.026	-0.033**	-0.014	-0.053***	0.006
	(0.309)	(0.008)	(0.013)	(0.014)	(0.014)	(0.015)	(0.016)	(0.016)	(0.017)	(0.015)	(0.008)
2SLS											
$1(Gender \widehat{Diverse} Board)$	-0.610	-0.224***	-0.056	-0.111***	-0.089**	-6.81×10^{-5}	-0.078*	-0.102**	-0.045	-0.156***	0.015
	(0.855)	(0.015)	(0.039)	(0.041)	(0.041)	(0.041)	(0.046)	(0.044)	(0.046)	(0.041)	(0.020)
Fixed-effects											
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-SIC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fit statistics											
F-test (1st stage)	238.8	241.1	207.8	237.2	237.2	237.2	231.1	231.1	216.0	231.1	241.1
Observations	40,969	41,567	37,161	41,029	41,029	41,029	39,978	39,978	38,801	39,978	41,567
Dependent variable mean	61.9	0.956	0.354	0.759	0.618	0.454	0.529	0.354	0.429	0.512	0.808
Number of Firms	1,146	1,146	1,145	1,146	1,146	1,146	1,145	1,145	1,145	1,145	1,146

Clustered (Firm) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

The sample restricts to all directors within firms that were domestic, listed, and had all-male boards as of 2017. The time period covered is 2015 - 2020, with reported effects relative to the 2017 baseline. Standard errors clustered at the firm level. Treated firms have CA headquarters and all-male boards as of 2017. Two directors have a prior connection if they overlapped at a previous company. Regression is weighted by the inverse of annual board size. Director-level characteristics measured upon year of onboarding. Sectoral classification used to code sectoral experience is provided by BoardEx; see Table A5 for the full list of sectors. Experience and connections gained through work spells in non-listed companies are counted. Industry variable used in the fixed effects are derived from 4 digit SIC codes provided by CRSP. Sample sizes vary due to missing values of director characteristics.

Table VIII: Characteristics of Incoming, Exiting, and Retained Directors by Treatment Status

	California HQ				Non-California HQ			
	Entering F	Entering M	Exiting M	Retained M	Entering F	Entering M	Exiting M	Retained M
Age & Education								
Age	56.79	56.33	62.12	60.83	55.93	56.25	62.78	61.54
MBA Degree	0.33	0.33	0.39	0.39	0.33	0.35	0.34	0.35
Experience								
Prior Board Experience	0.56	0.69	0.82	0.80	0.57	0.68	0.77	0.78
Prior C-Suite Experience	0.62	0.64	0.67	0.70	0.62	0.64	0.58	0.62
Prior Same Sector Experience	0.48	0.58	0.54	0.52	0.42	0.52	0.47	0.44
Connections								
Prior Conx w/Board	0.31	0.37	0.56	0.58	0.29	0.48	0.57	0.55
Prior Board Conx w/Board	0.08	0.13	0.40	0.41	0.09	0.20	0.38	0.38
Prior Conx w/ C-Suite	0.19	0.29	0.47	0.50	0.17	0.33	0.44	0.44
Prior Same Gender Conx w/Board	0.03	0.35	0.55	0.57	0.03	0.46	0.56	0.54
Non-Executive Director	0.93	0.80	0.84	0.78	0.95	0.80	0.83	0.80
Committee Composition								
Number of Committees	1.87	2.44	2.81	2.82	1.90	2.19	2.61	2.68
Audit Committee	0.54	0.62	0.63	0.69	0.57	0.63	0.65	0.68
Compensation Committee	0.51	0.60	0.66	0.64	0.46	0.53	0.62	0.62
Nominating Committee	0.54	0.54	0.62	0.60	0.50	0.43	0.54	0.56
Other Committee	0.04	0.03	0.04	0.04	0.06	0.08	0.07	0.07
Sample Size								
Number of Positions	214	224	402	941	566	1076	1660	4856
Number of Directors	210	222	391	919	549	1058	1614	4592
Number of Companies	147	105	150	198	443	502	646	918

Note:
The sample considers firms that were domestic, listed, and had all-male boards as of 2017. Entering (Exiting) directors join (leave) sometime between 2018 - 2020. Retained directors remain with the company between 2017 - 2020. These variables are derived from BoardEx's organizational summary files, which provides the complete director roster as of the annual report date. Two directors have a prior connection if they overlapped at a previous company. Director-level characteristics measured upon year of onboarding. Sectoral classification used to code sectoral experience is provided by BoardEx; see Table A5 for the full list of sectors. Directors may hold multiple positions. Some directors have missing characteristics.

Table A1: Effects of the Gender Quota on Board Composition: Robustness Checks

Dependent Variables:	1(All-Male Board)							1(Expand Board)						
	Size Control	Dem. Subsample	AMB 2015-2017	Small Brd	Male Industry	Triple Diff	CA Treated	Size Control	Dem. Subsample	AMB 2015-2017	Small Brd	Male Industry	Triple Diff	CA Treated
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Variables														
Treated × Year = 2015	-0.022	-0.040	0.0009	-0.030	-0.045	-0.107***	0.017	0.007	-0.054	0.004	0.036	-0.063	-0.041	-0.005
	(0.029)	(0.031)	(0.002)	(0.042)	(0.036)	(0.035)	(0.018)	(0.053)	(0.054)	(0.055)	(0.061)	(0.066)	(0.061)	(0.030)
Treated × Year = 2016	-0.005	-0.004	0.002	0.022	-0.007	-0.055**	0.021	-0.017	-0.063	-0.080*	-0.102**	-0.082	-0.034	-0.026
	(0.021)	(0.022)	(0.002)	(0.029)	(0.026)	(0.025)	(0.014)	(0.047)	(0.049)	(0.047)	(0.047)	(0.058)	(0.058)	(0.029)
Treated × Year = 2018	-0.042	-0.049	-0.008	-0.055	-0.024	-0.032	-0.009	0.051	0.039	0.046	0.040	0.030	0.054	-0.007
	(0.039)	(0.039)	(0.041)	(0.049)	(0.044)	(0.037)	(0.013)	(0.056)	(0.058)	(0.063)	(0.069)	(0.069)	(0.065)	(0.030)
Treated × Year = 2019	-0.281***	-0.331***	-0.303***	-0.364***	-0.322***	-0.301***	-0.094***	0.160***	0.102*	0.151***	0.197***	0.142**	0.079	0.073**
	(0.041)	(0.043)	(0.045)	(0.056)	(0.047)	(0.038)	(0.020)	(0.055)	(0.056)	(0.058)	(0.063)	(0.066)	(0.062)	(0.029)
Treated × Year = 2020	-0.299***	-0.334***	-0.329***	-0.389***	-0.283***	-0.306***	-0.088***	0.040	-0.031	-0.037	-0.028	-0.066	0.006	-0.021
	(0.033)	(0.037)	(0.034)	(0.048)	(0.039)	(0.032)	(0.021)	(0.054)	(0.054)	(0.058)	(0.066)	(0.063)	(0.061)	(0.029)
Treated × Year = 2021	-0.236***	-0.223***	-0.210***	-0.308***	-0.240***	-0.239***	-0.068***	0.109**	0.032	0.068	-0.027	0.083	-0.026	0.077**
	(0.027)	(0.031)	(0.030)	(0.040)	(0.029)	(0.025)	(0.021)	(0.054)	(0.059)	(0.060)	(0.068)	(0.069)	(0.065)	(0.031)
Log(Revenues)	-0.031***							0.004						
	(0.010)							(0.010)						
Fixed-effects														
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-SIC	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes		Yes
1(CA HQ)-Year						Yes							Yes	
1(AMB)-Year						Yes							Yes	
Fit statistics														
Observations	6,233	4,013	5,426	3,237	4,094	24,038	24,016	6,056	3,865	5,366	3,116	3,899	23,464	23,448
Dependent variable mean	0.690	0.683	0.729	0.725	0.689	0.226	0.226	0.227	0.234	0.217	0.203	0.235	0.257	0.257
Number of Firms	1,096	685	866	536	692	3,845	3,845	1,090	675	866	532	686	3,830	3,830

Clustered (Firm) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

The sample considers an unbalanced panel of domestic and listed firms observed between 2015 - 2021, with reported effects relative to the 2017 baseline. Standard errors are clustered at the firm level. Treated firms are defined to have CA headquarters and all-male boards as of 2017. Column 1 subsets to companies that had all-male boards in 2017. Log(Revenues) is used as a proxy for firm size. Col 2 further subsets to firms headquartered in Democratic states – states that voted for Hillary Clinton in the 2016 presidential election. Col 3 only considers companies that had all-male boards from 2015-2017. Col 4 subsets to companies that had fewer than 7 directors (the median board size) in 2017. Col 5 subsets to firms in industries with below-average female board representation. Industry classification and averages calculated using the 2017 cross-section. Col 6 makes no additional restrictions. Col 7 makes no additional restrictions, and redefines treated firms to have CA headquarters as of 2017. The 'Expand Board' indicator equals one if board size increases relative to the prior year. Cols 8-14 make the analogous sample restrictions. All outcome variables are derived from BoardEx's organizational summary files, which provides the director roster as of the company's annual report date. Industries are categorized into 11 divisions using the 4 digit SIC code, following OSHA's crosswalk. SIC codes are derived from CRSP's Names files. CA SB 826, approved on 9/30/2018, mandated at least 1 woman be on the corporate board of any listed with HQ in CA by 12/31/2019.

Table A2: Share of BoardEx Companies Matched with the Following:

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	BoardEx N	CRSP/ Compustat	Annual Financials	Listing Exchange	Geographic Identifiers	All of (2-6)
2015	4188	0.967	0.950	0.962	0.960	0.941
2016	4030	0.969	0.953	0.965	0.963	0.944
2017	4000	0.970	0.956	0.966	0.963	0.947
2018	3980	0.967	0.955	0.963	0.960	0.948
2019	3971	0.960	0.952	0.956	0.958	0.948
2020	4149	0.933	0.926	0.929	0.933	0.921
2021	4546	0.874	0.866	0.874	0.874	0.866

Note:

Note: Column (2) restricts to BoardEx's 'Quoted' and US based companies that report annual board gender ratios. BoardEx-CRSP-Compustat crosswalk provided by WRDS. Annual Financials derived from the Compustat Annual Fundamental files. Listing exchange pulled from CRSP Names file. Geographic identifiers include both the state of the company's principal executive offices and the country of incorporation. These values are taken from Compustat Snapshot. If missing, geographic identifiers taken from the WRDS SEC Analytics Suite (item regstatehdq). If still missing and the year is past 2019, the value is taken from Boardex's header level information provided in the Company Profile files.

Table A3: Non-Compliance, Evasion, and Attrition

Firm Status	Year	N: AMB	N: Diverse	N	Change in N	N: Delist	N: Change HQ
Treated	2015	151	23	174	NA	0	2
Treated	2016	179	12	191	17	0	5
Treated	2017	204	0	204	13	4	2
Treated	2018	135	48	183	-21	8	3
Treated	2019	40	131	171	-12	14	4
Treated	2020	16	143	159	-12	12	3
Treated	2021	6	140	146	-13	10	4
Control	2015	722	75	797	NA	0	19
Control	2016	804	46	850	53	0	16
Control	2017	942	0	942	92	7	30
Control	2018	654	202	856	-86	42	23
Control	2019	431	367	798	-58	77	18
Control	2020	300	436	736	-62	46	25
Control	2021	186	495	681	-55	39	11

Note:
Treated firms have CA headquarters and are listed as of 2017, while control firms are listed and headquartered in another US state as of 2017. Cols 3-6 are derived from BoardEx's organizational summary files, which indicates a company's annual gender ratio. Companies may fail to appear in BoardEx if the company goes private, ceases to exist, or if BoardEx doesn't collect the company's gender composition as of the annual report date. Col 7 is derived from CRSP's Delisting file; a company is defined to delist if none of the company's securities are listed the subsequent year. The last column uses headquarter location data triangulated from Compustat Snapshot, BoardEx, and SEC filings.

Table A4: Differential Attrition?

Annual Board Gender Reporting Rates

Year	California HQ	Outside CA HQ	Diff	P-Val	N: California HQ	N: Outside CA HQ
2015	0.85	0.85	0.01	0.80	174	797
2016	0.94	0.90	0.03	0.09	191	850
2017	1.00	1.00	0.00	1.00	204	942
2018	0.90	0.91	-0.01	0.62	183	856
2019	0.84	0.85	-0.01	0.75	171	798
2020	0.78	0.78	0.00	0.95	159	736
2021	0.72	0.72	-0.01	0.84	146	681

Note:

The sample restricts to companies that i) had all-male boards in 2017 and ii) were listed and domestic in 2017. Raw means and p-values from a two sided t-test reported. Annual board gender composition is provided by Boardex's Organizational Summary files. Attrition may occur if the company goes private, ceases to exist, or if BoardEx doesn't collect the company's gender composition as of the annual report date.

Table A5: Pipeline: Number of Women with Top-Level Experience in 2017

Sector	Any Position	Board Position	C-Suite Position	N: Treated Firms
Pharmaceuticals and Biotechnology	746	310	182	47
Software and Computer Services	710	243	117	22
Health	360	206	75	20
Information Technology Hardware	248	87	45	20
Electronic and Electrical Equipment	360	226	46	14
Real Estate	351	251	47	9
Business Services	364	186	58	8
Telecommunication Services	212	76	31	8
Banks	1043	649	138	6
Engineering and Machinery	243	140	42	5
Food Producers and Processors	205	127	31	5
Media and Entertainment	171	85	33	5
Renewable Energy	46	32	6	5
Speciality and Other Finance	472	213	76	4
Beverages	71	24	18	3
Clothing and Personal Products	191	108	30	3
General Retailers	421	219	93	3
Containers and Packaging	40	28	5	2
Insurance	323	157	71	2
Automobiles and Parts	127	65	20	1
Blank Check / Shell Companies	2	1	0	1
Construction and Building Materials	134	101	13	1
Education	36	21	7	1
Electricity	64	23	11	1
Household Products	123	80	17	1
Investment Companies	110	89	9	1
Leisure and Hotels	375	205	76	1
Leisure Goods	46	30	6	1
Oil and Gas	238	146	32	1
Private Equity	41	12	4	1
Steel and Other Metals	56	40	8	1
Utilities - Other	274	168	46	1

Note:
The sample restricts to women working in domestic and listed companies as of 2017, the year prior to the passage of SB826. Since BoardEx tracks the employment histories of board members, the women considered have sat on a board sometime between 1950 and 2020 (the years of BoardEx coverage). The variables are derived from Boardex's employment history files, which tracks the work histories of board members. Sector classification following FTSE is provided by BoardEx. The data is sorted on the industries that contain the most number of treated firms – the firms that are listed and have CA headquarters as of 2017.