Job Market Paper

How Do Firms Respond to Gender Quotas?: Evidence From California's SB826

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Preliminary – Please Do Not Circulate

Abstract

Quotas are often discussed as policy levers that can increase organizational diversity, but there is much controversy about whether they can achieve gains in diverse representation without harming organizational outcomes. In 2018, California passed a gender quota requiring the presence of at least one woman on corporate boards by the end of 2019. Exploiting variation in the board's gender composition induced by the quota, I show that gender diverse boards do not adversely affect various measures of board quality. These results challenge the theory that the prevalence of all-male boards is driven by a scarcity of qualified female candidates. Instead, I provide evidence that two channels contribute to the lack of gender parity on boards – negative stereotypes of female directors held by investors and a lack of female connections to corporate leaders. These findings indicate that frictions in the labor market prevent some qualified women from obtaining board positions.

1 Introduction

In the United States, gender parity in top leadership positions is a relatively rare occurrence. A recent Pew report documents that as of 2020, women constituted 27% of Congress, 18% of state governors, and 7% of Fortune 500 CEOs.[1] The lack of gender parity in leadership comes despite sizable female representation in graduate and professional schools. Women comprised 38% of MBA graduates in 1995, yet twenty five years later, only represented 21% of corporate boards (Figure 1).

Various explanations have been proposed to explain the lack of gender parity on corporate boards. Women may lack the human capital typical of board members, such as prior C-Suite or board experience (Ahern and Dittmar 2012). The shareholders who are responsible for electing board members may have prior perceptions that female corporate leaders are less capable of performing their duties (Lee and James 2003), perhaps due to the existing absence of female leaders. Aspiring female directors may not have connections to (predominantly male) corporate leadership, which help candidates secure corporate leadership positions (von Essen and Smith 2022; Bolte et al 2021).

This paper proposes to test these hypotheses by using variation in board composition induced by California's SB826, the first gender-based quota for corporate boards in the United States.[2] To achieve a greater female presence on corporate boards, SB826 requires 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.[3] I investigate whether companies subject

[1] See https://www.pewresearch.org/social-trends/fact-sheet/the-data-on-women-leaders/

[2] For a list of gender quotas implemented outside the United States, see Table 1 of Terjesen et al. (2015).

[3] California's gender quota arrives in the context of growing interest in boardroom Diversity, Equity, and Inclusion. In August 2021, the SEC approved NASDAQ's requirement that listed firms disclose whether they have at least two diverse directors. Furthermore, Hawaii, Massachusetts, Michigan, New Jersey, and Washington are considering adopting laws similar to SB826.

to the quota added female representation, and if so, whether compliance with the quota affected various measures of boardroom quality.

Theoretically, it is unclear whether boardroom gender quotas should worsen, improve, or have no effect on boardroom quality. In a textbook argument, firms optimally choose the board of directors to maximize shareholder value. External factors that constrain the firm's ability to optimize, such as a government mandated gender quota, should worsen board quality measures. For example, if companies choose all-male boards because men are more likely to have executive experience, then quotas should reduce the share of directors with such experience. A competing view highlights that quotas may nudge companies into recruiting from a pool of directors with distinctive work experiences. In turn, these directors may improve boardroom quality by bringing new skills to the boardroom or better monitoring corporate executives.[4] However, quota-appointed directors may also be token appointments, lacking the influence to shape the board of directors' collective decision making. This may be especially true when the quota-appointed director is the sole female on a large board.

An empirical challenge in assessing how California's quota shifted boardroom quality lies in measuring director contribution. For example, studies have found that gender diverse boards are tougher monitors of executives (Adams and Ferreira 2008), foster investment in fruitful Research and Development activities (Bernile et al. 2018), and are less likely to undertake workforce reductions (Matsa and Miller 2013). These findings imply that measurement of a director's human capital solely based on the director's observable characteristics can be misleading. To overcome this issue, I link data between BoardEx, Compustat, and CRSP to construct three proxies for how SB826 affected boardroom quality. First, I consider whether female directors appointed after the quota differ on traditional measures of human capital, such as experience, tenure, age, and education. Second, I analyze whether companies subject to the quota had better or worse operating performance, as measured by bottom-line metrics on the Income and Balance Sheet. Third, I study the short and long-run abnormal returns of quota-affected companies – metrics of how investors perceive boardroom quality.

To examine how the quota affected these various measures of boardroom quality, I track firm-level outcomes of all domestic listed companies that had no female representation in 2017. Among these companies, only the firms based in CA as of 2017 had to change board composition to be compliant with SB826 ("treated

See https://corpgov.law.harvard.edu/2020/03/18/new-report-on-california-board-gender-diversity-mandate/

[4]One reason quota-appointed directors may be tougher monitors is that they are less likely to belong to the "Old Boys Club." To the extent that firms benefit from additional monitoring, the quota may improve financial performance. Note that excessive monitoring by the board may deteriorate firm outcomes (Adams and Ferriera 2008). See Kim and Starks (2016) for empirical evidence that female directors possess skill-sets typically missing on corporate boards. See Spitzer and Talley (2013) for a theoretical model demonstrating how quota-appointed directors may shift group-level decision making. Viewed through their model, quota-appointed directors may undertake costly investments in information acquisition that can shift the preferences of the median director.

or quota-affected firms").[5] I use the firms based outside of California as my control group and verify that the conditional independence assumption required of difference-in-differences research designs is likely to hold. The identification strategy leveraging quota-induced changes in board composition overcomes substantial endogeneity concerns present in the literature. As stressed by Adams, Weisbach, and Hermalin (2008), board structure is an equilibrium outcome designed to address a company's corporate governance issues. For example, shareholders may elect directors to optimally monitor company executives. Observational studies that compare outcomes across firms with varying degrees of board gender diversity will not capture the causal impact of gender diverse boards. Moreover, changes in outcomes within a firm (before and after shifts in the board's composition) may reflect changes in a company's strategic objectives rather than the causal impact of gender-diverse boards.[6] In the US context, most studies that assess the effects of board gender diversity have relied upon the prior approaches.[7] By exploiting variation in board composition induced by legislation, I provide more credible estimates of the impact of gender-diverse boards.

I find that the legislation successfully introduced gender diversity onto corporate boards without reducing boardroom quality. In 2017, there were 196 California-based listed companies with all-male boards. By the end of 2019, fewer than 60 listed companies based in CA had all-male boards. The dramatic increase in boardroom gender diversity between 2017 and 2019 may not be entirely attributable to the quota, since the sample period is associated with national level trends towards increased female board representation. Consistent with this observation, my difference-in-differences estimates indicate that SB826 reduced the share of all-male boards by a more modest 28%. Robustness tests suggest that these results are not driven by other factors, such as shifts in attitudes about women in leadership particular to California.[8]

Despite the fact that the overwhelming majority of quota-affected firms added female directors, SB826 did not reduce boardroom quality within the two years after its implementation.[9] The difference-in-differences estimates reject the notion that SB826 reduced boardroom quality, as proxied by any of the three measures discussed earlier. SB826 did not reduce the average age of the boardroom or the share of directors with prior corporate leadership experience. Furthermore, the observable characteristics of incoming female directors

[5] These firms can also evade the legislation's reach by de-listing or changing headquarter location.

[6] For instance, a firm may hire female directors as part of its broader Corporate Social Responsibility efforts. In my sample, this methodological approach would misleadingly suggest that gender diverse boards immediately improve firm operating performance. The results using variation in board composition induced by SB826 instead indicate that gender diverse boards do not affect operating performance. A comparison of the results from these two approaches implies that growing firms adopt gender diverse boards. This result stands at odds with the widely held "Glass Cliff" hypothesis, which states that poorly performing companies are more likely to implement female leadership (Ryan and Haslem 2005; Cook and Glass 2013).

[7] See Bernile et al (2018) for an exception. They use the diversity of potential directors that live within a non-stop flight of a firm's headquarter as an instrument for board diversity.

[8] They are further not driven by differential attrition across treatment and control units (Table A3). CA-based firms affected by the quota are not more likely to take evasive actions – delist or change headquarter location – than firms in the control group (Table A4a).

[9] I restrict attention to the effects of the quota on boardroom quality between 2018 and 2020. I avoid considering SB826's longer-run effects since California passed AB979 in late 2020, which mandates the presence of directors from underrepresented communities by 12/31/2021. Since AB979 and SB826 both cover domestic and listed companies based in California, I cannot identify the causal effect of SB826 on boardroom quality after 2020.

joining treated firms are roughly comparable to those joining control firms. These findings counter claims that the quota would coerce firms to hire lower quality directors, since traditional measures of human capital are similar among quota-appointees and incoming female directors that firms voluntarily hire. Similarly, the quota did not deteriorate the operating performance or long-run abnormal returns of affected firms.

Overall, I reject the hypothesis that gender disparities in board membership are driven by a limited supply of qualified female candidates. Quota-affected firms swiftly complied with the legislation and their boards were not demonstrably less capable. These results naturally raise the question: why have boards traditionally lacked gender parity? To probe whether investors discriminate against female board candidates, I compare the short-run and long-run excess returns from holding a portfolio of companies affected by SB826. If investors mistakenly have negative perceptions of female director candidates, then one would expect quota-affected companies to have negative short run excess returns, but to not necessarily fare worse on long-run financial outcomes (Wolfers 2006). In other words, betting against quota-affected companies should not be a long-term profitable trading strategy as new information arrives about the quota's effects on boardroom quality. Consistent with this hypothesis, I document that quota-affected companies experience negative short run excess returns which vanish within one year.

Lack of female employment connections to key corporate players could also contribute to gender disparities on board membership. Supportive of this theory, I find that the typical incoming female director is 20 percentage points less likely to have a prior employment connection with a sitting board member or C-Suite executive than a typical incoming male director. These differences are magnified upon considering connections to corporate leaders of the same gender. Cumulatively, my results indicate that frictions in the labor market prevent some qualified women from obtaining board positions. Lack of female connections to corporate leadership and discrimination by investors provide plausible explanations for why boards lack gender parity.

This paper contributes directly to the literature examining firm reactions to SB826 (Hwang et al. (2018); von Meyerink et al. (2021); Gertsberg et al. (2020); Greene et al. (2020)). While these papers focus on the stock price reactions in the immediate days surrounding the legislation's signing, my study examines the longer-term impacts of the quota. In that sense, my methodology more closely resembles the literature that evaluates the longer-run effects of the 2003 Norwegian quota. Ahern and Dittmar (2012) find that the quota led to less experienced boards and lower firm values within 5 years. Bertrand et al. (2018) show that the female directors appointed after the quota (between 2009 to 2014) were more qualified than those appointed before the quota (between 1998 - 2003) 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 two years following SB826, the legislation

appears to not have affected various measures of board quality or operating performance.

The fact that SB826 had null effects on operating performance conflicts with literature showing female presence changes organizational outcomes. For example, Gompers et al. (2021) find that some venture capital partners hire female partners upon having a daughter. They conclude increased gender diversity at the partner level increases fund returns. Chattopadhyay and Duflo (2004) study a 1992 Indian gender quota that required one-third of local political positions to be reserved for women. As a result of the policy, they document the provision of public goods more closely aligned with the preferences of women. In the two years after SB826's adoption, the legislation appears to have successfully placed women onto corporate leadership without fundamentally altering firm outcomes.

More broadly, this paper adds to scholarship on the barriers women face in obtaining leadership positions. By showing that female directors are drastically less likely than male directors to have prior employment relationships with company leadership, I provide direct evidence that the "Old Boys Club" operates in the director labor market.[10] Given that the job market heavily relies on referrals (ie. Bolte et al. 2020), the lack of female connections to corporate leaders likely contributes to boardroom gender disparities. Moreover, I find investors may underestimate the capability of female directors, as documented by the presence of negative short run excess returns that vanish over the long-run. Since investors vote to approve or reject board nominees, investor misperceptions of female directors' ability provides another candidate explanation for boardroom gender disparities.

This paper proceeds as follows. I discuss SB826 requirements in Section 2 and data details in Section 3. In Section 4, I describe compliance with the legislation. Sections 5 and 6 discuss the legislation's impacts on board characteristics and financial outcomes. Section 7 concludes.

2 Legal Context

On 9/30/2018, California Governor Jerry Brown signed into law Senate Bill (SB) 826, which requires publicly-held corporations with a principal executive office in California to have at least one female director on their Board of Directors by December 31, 2019.[11] By the end of 2021, companies with 5 directors are mandated to at least 2 female directors and companies with 6 or more directors are required to have at least 3 female

[10] See Drechsel-Grau and Holub (2020), Cullen and Perez-Truglia (2021), von Essen and Smith (2021), and Chevrot-Bianco (2021) on how gendered connection patterns affect workplace outcomes. See Hallock (1997) for an earlier study on board interlock and its impacts on firm outcomes.

[11] 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." Publicly-held companies have shares listed on the New York Stock Exchange, NASDAQ, or NYSE American. California's quota arrives in the context of growing domestic interest in boardroom diversity, equity, and inclusion. In 2013, the California legislature approved SCR62, which encouraged all publicly-held firms to have at least one female board member by the end of 2016. This legislation did not impose fines for firms that failed to abide by the recommendation, and by 2017, more than 30 percent of California-based companies continued to have all-male boards (Table 1). As a result, the author of SCR62 introduced SB826 as a "follow up" (Bishop 2018).

directors. I study how companies responded to the first stage of SB826, the very first board gender quota in the United States.[12]

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.[13] 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 assessed for the first violation, and $300,000 for each subsequent violation.[14]

Firms affected by SB826 have a couple of options to avoid paying fines.[15] First, these companies can add a female board member between 01/1/2018 - 12/31/2019, either by replacing an existing male director or by expanding the size of the board.[16] Second, these companies can evade the reach of the legislation by going private or changing headquarter location.

Building upon SB826, California Governor Newsom approved AB979 in late 2020, which requires the companies subject to SB826 to also have at least one director from an underrepresented community by the end of 2021.[17] Following California's lead, the SEC approved NASDAQ's board diversity disclosure requirements in August 2021. NASDAQ's rules encourage companies listed on its exchange to have at least 2 diverse directors, or else release a public statement indicating why the requirement could not be met. Companies that fail to meet the recommendation face no financial penalties, so long as a public statement is provided. To isolate the effects of California's gender quota (as opposed to the joint effects of SB826, AB979, and NASDAQ's rule), my empirical analysis concludes by the end of 2020.

[12] SB826 faces several open legal challenges as of this writing. One line of argument posits that the legislation imposes a gender quota that violates the California constitution. Another argues that California's legislation violates the internal affairs doctrine, requiring companies headquartered in California but incorporated elsewhere to abide by two sets of laws. See Grundfest (2018) for further details.

[13] In contrast to listed companies, who are required to file annual reports with the SEC, private companies are not mandated to disclose their financial information to the general public. Since this paper addresses the effect of SB826 on financial performance, I restrict attention to listed companies. 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.

[14] 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 also comes with 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/. See also https://corpgov.law.harvard.edu/2020/03/18/new-report-on-california-board-gender-diversity-mandate/

[15] I define "affected" firms as listed companies with all-male boards as of 2017. In principle, the legislation can deter companies from transitioning from a gender diverse board (boards with at least one woman) to an all-male board. However, Table **??** shows that such transitions are very rare.

[16] Corporate executives cannot unilaterally change board size. Under California General Corporation Law, the number of directors is determined by the board or shareholders (Bishop 2018).

[17] A director from an underrepresented community is an individual who self-identifies as Black, African American, Hispanic, Latino, Asian, Pacific Islander, Native American, Native Hawaiian, or Alaska Native, or who self-identifies as gay, lesbian, bisexual, or transgender. AB979 imposes fines for non-compliance.

3 Data Sources and Sample Description

3.1 Data Sources

To analyze how the gender quota shifted the composition of corporate boards, I use data from BoardEx, a financial technology company. I employ data from Compustat and CRSP to investigate how SB826 affected financial performance. These three data sources can be linked, permitting me to study relationships between director characteristics, board characteristics, and firm outcomes.[18]

BoardEx provides detailed information on both the composition of corporate boards and the employment histories of directors.[19] Using information from a company's annual reports, BoardEx provides yearly descriptors of the board's size and gender composition.[20] Using published online reports, BoardEx also characterizes the gender and complete employment history of directors in its database.[21] Prior roles of directors contain a start and end date, allowing me to construct measures of a director's experience at a given point in time. These employment histories also enable BoardEx to determine whether any two directors in its database share any prior employment connection.[22] I consider domestic and listed firms observed after 2010. Under this sample restriction, I observe the annual board composition of approximately 4000 companies (see Table A1), which represents the near universe of domestic listed companies.[23]

I use BoardEx data to assess compliance with the quota and understand the characteristics of directors added after SB826. Director characteristics are measured over a range of dimensions, including education, experience, and prior employment connections at the start of the directorship. In contrast to most related papers, I directly observe whether directors added after the quota have prior employment relationships with sitting directors.[24] This relationship mapping allows me to assess the types of work experiences that directors typically obtain and to conclude whether the female directors added after SB826 possess distinctive work experiences.

To understand how the quota impacted financial outcomes, I link BoardEx's firm-year panel on board composition with Compustat's quarterly financial statements. Each year, approximately 90 percent of companies from BoardEx can be linked to Compustat (Table A1, Col 4), suggesting that both data sources cover

[18] 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 and Compustat. The crosswalk does not cover firms that enter BoardEx after 5/2020, so I append the crosswalk with companies that have identical CIKs and CUSIPs in BoardEx and Compustat.

[19] Unlike many administrative data sources, BoardEx does not track employment histories of all non-directors.

[20] Characteristics of the board are measured as of the month the company files its annual report.

[21] Gender is not imputed based on first name. 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.

[22] If such a connection exists, the exact start and stop dates of the connection are also provided.

[23] The number of domestic listed companies from BoardEx and CRSP are approximately equal. See Jay Ritter's website for measurements from CRSP.

[24] For exceptions in contexts outside of CA's SB826, see Smith (2021), Chevrot-Bianco (2021), and Hallock (1997).

the near universe of domestic listed companies. Using the quarterly Compustat data, I construct measures of Firm Value and Operating Performance. Following existing literature, I consider Market Value and Tobin's Q as of fiscal quarter end as measures of Firm Value.[25] I use Return on Assets (Net Income divided by Total Assets), Net Income, Book Value, Revenues, Cost of Goods Sold, Total Assets, and Total Liabilities as measures of Operating Performance. In rare instances, companies report non-positive Total Assets or Book Value, in which case the observation is dropped.

Companies may respond to the quota by delisting or changing headquarter locations. To investigate this possibility, I acquire historical information on each company's headquarter location and the listing exchange of its securities from Compustat's Snapshot and SEC history files.[26]

3.2 Sample Description

Table 1 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. All firms considered in my analysis are US-based ("domestic") and listed, so I drop these adjectives going forward.[27] 16 to 18 percent of all firms in the sample are headquartered in California between 2015 - 2020. Furthermore, in the three years prior to the legislation, 31 - 39 percent of CA-based firms had all-male boards, with a combined Market Value of approximately 123 billion dollars as of 2017 Q1. These values demonstrate that the legislation impacted a non-trivial portion of firms.

Despite the fact that SB826 regulates board gender composition for all listed firms based in California, many legally covered 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.[28] Thus, 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

[25] I calculate "Simple Tobin's Q" as Market Value divided by Book Value. Bartlett and Partnoy (2020) cogently argue that Tobin's Q does not accurately capture Firm Value.

[26] The listing exchange of a company's securities are derived from the SEC history files; missing values are filled in with reports from Compustat Snapshot. 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 A1.

[27] US-based refers to companies headquartered or incorporated in the US. BoardEx does collect board gender information for some private firms, but coverage is not universal. To avoid making cross country comparisons, I do not collect board information on companies incorporated outside the US.

[28] 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. Table **??** shows that in each year between 2010 - 2019, only 1 to 3 percent of domestic listed companies transition from having a gender diverse board to an all-male board in the following year. Figure **??** corroborates this argument, showing that older firms are more likely to have gender diverse boards in the 2017 cross-section.

passage.[29] 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 2. Prior to the quota (between 2010 - 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 and have lower net incomes, book values, and return on assets than control firms. Despite these differences in financial outcomes, the directors joining treatment and control firms appear similar on observable characteristics. 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.

4 How Did Firms Comply with SB826?

Studies of board gender quotas in other countries suggest that companies may restructure to avoid adding female directors. 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. (2014) document sizable evasion: of the 563 public limited liability companies affected by the quota in 2003, only 179 maintained corporate form by 2008. Unlike the Norwegian context, the first stage of SB826 only required affected firms to add one female director. Moreover, SB826's monetary penalties for non-compliance are mild relative to forced dissolution. As a result, one would expect far less evasive behavior among California-based firms affected by the gender quota.[30]

Indeed, I find that very few treated firms took evasive actions. Between 2017 and 2020, only 7 percent of treated firms delisted or changed headquarter location. Firms in the control group were actually *more likely* to change headquarter location and equally likely to go private (Table A4a). 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. Suggestive evidence is that the quota *caused* firms to add female directors. First, there were 196 California companies with all-male boards in 2017, but only 29 in 2020 (Table 1). Second, Table **??** shows the probability that a California-based company maintains an all-male board the subsequent year declines from 93 percent in 2010 to 29 percent in 2018.

[29] I avoid classifying CA listed firms with all-male boards prior in 2016 as "treated", since 20 percent of these companies have gender diverse boards the following year (Table **??**). Since CA-based listed companies with all-male boards (AMBs) as of 2016 are not affected by the quota, CA-based listed companies with AMBs prior to 2016 are not affected. My classification of treated firms as those companies that need to make changes to comply with the law follows the tradition of Stevenson (2010).

[30] In CA context, affected firms can evade, comply, or not comply. I refer to "evasion" as corporate restructure (ie. changing headquarter location or going private), "compliance" as the addition of female board members without corporate restructure, and "non-compliance" as payment of SB826 monetary penalties while maintaining the status quo. Note all three actions place companies within the letter of the law.

While increases in female board representation among treated companies are prominent, these changes may not solely reflect the causal effect of the gender quota. Overall 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 Californian companies with all-male boards, I also consider changes in board composition among non-CA-based firms with all-male boards in 2017 ("control firms"). Formally, using the firm-year panel from 2015 - 2020, I estimate the parameters of the following OLS regression:

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

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, as opposed to the more standard year fixed effects, to account for different industry compositions between treatment and control firms (see Table 2). Estimates of β^t represent differences in board composition 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").[31] All regressions use an unbalanced panel of firms and cluster standard errors at the firm level.[32] To visualize some of the assumptions made in Equation 1 more clearly, observe that

$$Y_{fti}(0) = \gamma_0 + \delta_f + \delta_{ti} + \epsilon_{fti} \tag{2}$$

$$Y_{fti} = Y_{fti}(0) + \sum_{t \neq 2017} \beta^t \Big(1[Year = t] \times CA\ HQ_{2017} \Big) \tag{3}$$

where $Y_{fti}(0)$ refers to board composition if a firm were to not be affected by SB826.[33] Equation 2 restates the parallel trends assumption, which is un-testable because counterfactual outcomes are not observed for treated firms after 2017. If the parallel trends assumption holds true and treated firms did not anticipate SB826, then estimates of β^t for $t < 2017$ should be close to 0 (Borusyak et al. 2021).[34]

[31] This assumption would be violated, for example, if attitudes about women in leadership shift differentially in treated manufacturing firms relative to control manufacturing firms.

[32] Similar results with standard errors clustered at the one digit industry level (8 industries) are available upon request. See Footnote 35 for an explanation for why I use an unbalanced panel.

[33] It is further assumed that $E[\epsilon_{fti} = 0]$

[34] Greene et al. (2020) argue firms did not anticipate the governor's signing of SB826, documenting the distinctive absence of abnormal market returns for quota-affected companies prior to Gov. Brown's approval on 9/30/2018. More subtly, Equation 2 also incorporates the SUTVA ("no spillover effects") assumption, which states that board composition for firms headquartered

Prior to SB826, changes in outcomes between the 196 treated firms and 928 control firms are similar, providing prima-facie evidence that the parallel trends assumption is likely to hold.[35] As observed in 2017, treated firms are younger, have smaller boards, lower market capitalization, and are more concentrated in manufacturing than control firms, reflecting underlying differences between firms headquartered inside and outside California (see Tables 2, **??**). Despite pre-quota differences in firm characteristics between the treatment and control groups, almost all outcomes related to board composition and financial performance evolve similarly prior to SB826 (Table 3 and Figure **??**). Furthermore, the directors who join treated and control firms prior to the quota generally have similar observable characteristics, though directors who join treated firms are slightly more likely to have prior board and C-Suite experience.

Table 3 presents estimates of the event study parameters in Equation 1. Taken at face value, SB826 reduced the share of all-male boards by 30 percentage points (pp) and raised the female board share by 6 pp within one year. By 2019, treated firms increased their board size by an average of .25 seats and were 12 pp more likely to have an expanded board due to the quota.

4.1 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 from Table 3 would be underestimates. This would be consistent with the discussion in von Meyerinck et al. (2021), who document that California often sets policy trends that are 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 this "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 3 would overestimate the true effect of SB826.

I find that social trends or spillover effects are unlikely to create bias in the parameter estimates from Equation 1. Table **??** presents results when I re-estimate Equation 1, but further restrict the control group to firms headquartered in Democratic states.[36] As conjectured by von Meyerinck et al. (2021), Democratic states are more likely to adopt gender quotas like SB826 than Republican states.[37] Furthermore, attitudes

outside of CA is unaffected by SB826 (Cox 1958). Further, Equation 3 highlights Equation 1's assumption that the effects of SB826 can vary over time, but not over firms.

[35]Some of these firms may not appear in my constructed firm-year panel outside of 2017 due to firm entry into and exit from listed status (ie. some firms IPO, go private, or dissolve). Table A3 presents annual attrition rates between 2015 - 2020 for the treatment and control groups separately. Two-sided t-tests reject the presence of differential attrition in any year, although 22 percent of treated and control firms exit my sample by 2020.In this paper, I remain consistent in using an unbalanced panel so as to have sufficient statistical power. Firms in the balanced panel tend to be older and larger than those in the unbalanced panel, as seen in Table **??**.

[36]These are states that voted for Hillary Clinton in the 2016 election.

[37]No state besides California has passed a gender quota between 2015 - 2020.

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 Table **??** should be muted relative to those in Table 3.

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.[38] These numbers provide evidence that the effects documented in Table 3 are not overestimated due to omitted variables particular to Democratic states.

Furthermore, 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 (in Table 3) 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. Figure **??** tracks the average male board share over time among CA companies that already had female board representation in 2017. While the average female board share among the companies considered does modestly rise between 2017 and 2020 (by less than 10 pp), similar gains are also observed among non-CA-based companies without all-male boards in 2017. Figure 3 makes the same comparisons but plots the share of companies with all-male boards; similar conclusions hold. Given the visual evidence in Figures **??** and 3, it is not surprising that the triple differences point estimates presented in Table **??** fall within the 95 percent confidence interval of Table 3's estimates.[39] These results corroborate that the magnitudes presented in Table 3 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 take systematic actions to evade the scope of SB826. By 2020, the best estimates suggest that the quota raised the average share of female board members by 8 percentage points and reduced the share of all-male boards by 28 percentage points. To accommodate these female board members, affected firms were substantially more likely to increase the size of their board. For context, among all US firms, the average female board share increased by 9 percentage points from 12 percent in 2015 to 21 percent in 2020. Therefore, SB826 can be viewed as accelerating trends towards increased board gender diversity.

[38] Table **??** documents that SB826 reduced the share of all-male boards by 32 pp by 2020, while Table 3 documents a reduction of 28 pp. Similarly, the former table shows SB826 increased female board share by 8pp, while the latter table shows a 7pp increase.

[39] The sources of variation exploited in the triple differences specification are i) before versus after SB826, ii) CA-based versus non-CA-based, iii) all-male board in 2017 versus gender-diverse board in 2017.

5 Do Directors Appointed After SB826 Have Distinctive Characteristics?

Recent studies have documented a negative share price reaction to SB826 upon the legislation's announcement, with various explanations for the finding.[40] Greene et al. (2020) argue that the negative share price reaction partly reflects a pipeline issue – that there is an insufficient supply of qualified female candidates to fill the seats required by SB826. This view is contested by Gertsberg et al. (2020), who document that shareholder support for male and female directors appointed after the quota is comparable.

The director-level data I consider allows me to distinguish between the two views presented above. If there is an insufficient supply of qualified female candidates to fill the seats required by SB826, then one might expect traits typical of board members (such as prior board and C-Suite experience) to not be present among directors appointed after the quota. Such evidence would reaffirm the conclusion by Greene et al. (2020).

Evidence that female directors appointed after SB826 have similar qualifications as their peers would corroborate the argument by Gertsberg et al. (2020). However, if a reservoir of qualified female board candidates exists, the question arises: why did 31 percent of California-based companies have all-male boards prior to the legislation? One explanation is that prior employment connections with company leadership help candidates attain board positions, and that female candidates are less likely to have these types of connections. Von Essen and Smith (2021) find evidence of this "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 (2021) show that gendered connection patterns advantage males in the promotion process.[41]

To investigate these considerations, 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. Further, I inquire whether the female directors joining treated firms have distinctive characteristics relative to female directors joining control firms.

Table 4 shows that between 2015 - 2020, a period of gradual board gender diversification, new male hires still outpace new female hires by more than three to one. Female new hires 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,

[40] See Hwang et al. (2018), von Meyerink et al. (2021), Gertsberg et al. (2020), Greene et al. (2020).

[41] See also Drechsel-Grau and Holub (2020). Since the BoardEx director-level data I use contains the employment history of directors (but not of non-directors), I am unable to see if connections increase the probability of board membership. However, I can compare connection patterns between male and female board members.

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 (56% men vs 43% women).

Given the experience gaps documented, it may not be surprising to see that incoming male board members are more likely to have employment relationships with existing company leadership. Men have a staggering 21pp advantage in having prior connections with the incumbent board and with the C-Suite. These gaps are exacerbated when considering the incidence of having a same-gender connection to the incumbent board: 58 percent of incoming male hires have a previous employment relationship with a sitting male director. In contrast, 13 percent of incoming female directors have previous employment relationships with a sitting female director. Further, 95 percent of incoming female directors are Non-Executive directors (compared to 82 percent of male directors), consistent 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.

To evaluate whether SB826 caused California firms to appoint less-qualified directors based on observable characteristics, I compare incoming female directors in the treatment and control groups.[42] If US companies hire from the same pool of directors, female director characteristics in the control group provide a benchmark for director characteristics in the treatment group had treated firms not faced SB826's constraints. [43]

I find that incoming female directors to treated firms are observably similar to those in control firms (Table **??**). Women joining CA-based firms tend to be 1 year older, are 4 pp less likely to have prior board experience, and are 5 pp more likely to have prior C-Suite experience; however, none of these differences are statistically significant at conventional levels. Women in the two groups also appear similar on connections with the incumbent board; differences in the share with prior connections to existing company leadership are indistinguishable from zero.[44] Treated firms are much more likely to add female directors after SB826 passage (75% treated vs 43% control), consistent with the idea that the directors in the sample were hired

[42]Ideally, one would identify the directors appointed *because of* the quota, and compare the characteristics of these directors to their peers. However, firm hiring decisions under counterfactual legal regimes are not observed, so this exercise is infeasible. To make headway, I restrict attention to the directors appointed to treatment and control firms between SB826 passage and the end of the sample period (12/31/2020). Among this set, I focus on the directors that would make companies compliant with SB826's gender requirements. For example, if a company in the treatment or control group has no female directors upon SB826 passage and a board size of 6, the first three female hires are considered. As another example, if a company in the treatment or control group has 1 female director upon SB826 passage and a board size of 6, the first two female directors are considered. Recall that firms in the treatment and control groups have all-male boards as of the 2017 annual report. These sample restrictions ensure that the directors considered are the ones more likely to be appointed due to the quota.

[43]This comparison might understate the effect of SB826 on director quality if treated firms tend to hire from a more qualified pool of directors. As a result, I also compare the differences from Table **??** to underlying differences in director quality between treatment and control firms.

[44]It is noteworthy that incoming female directors post SB826 are less likely to be connected than incoming female directors pre-SB826. For example, 39 percent of all incoming female directors between 2015 and 2020 have a prior connection to the board, while fewer than 30 percent of the directors considered in Table **??** have a similar connection.

due to the legislation.[45] Furthermore, 198 female directors filled 203 vacancies, indicating that treated firms pulled from a diverse array of board candidates.

The results from this section provide tentative support to the claim that there are enough qualified women to fill the seats required by SB826.[46] Incoming female directors to treated and control firms are comparable on observable characteristics; further, very few women serve as the quota-appointed director for multiple companies. Given this point, one wonders why all-male boards were prevalent in California prior to SB826. The fact that female directors are substantially less likely than male directors to have prior relationships with company leadership offers a candidate explanation.

6 How Do Gender Diverse Boards Affect Financial Performance?

Directors may contribute to firm performance in ways that are not captured by traditional measures of qualifications. For example, Adams and Ferriera (2008) (henceforth AF (2008)) find that women directors are less likely to have attendance problems and suggest that gender diverse boards are tougher monitors of executives.[47] Because female directors may change the way the board collectively monitors executives, even single female additions can impact the way boards behave.

A hurdle in establishing causal impacts of gender diverse boards is the endogeneity of board composition. As stressed by Adams, Weisbach, and Hermalin (2008), the governance structure of a company is an equilibrium outcome designed to address the company's corporate governance problems. For example, shareholders may elect directors to optimally monitor company executives. Since board composition (including the gender of its directors) is not randomly assigned, comparisons between companies with more and fewer female directors will misstate the effects of gender diverse boards.

Within the US context, convincing causal estimates are scant due to the lack of natural experiments that affect a board's gender composition. This sentiment is reflected in Post and Byron's (2015) review of the literature, who call for studies to elucidate potential endogeneity in the board's determination. Widely cited estimates of the effects of gender diversity on Firm Value come from AF (2008), who use a firm fixed effects specification. Their econometric model attempts to identify the effects of gender diversity by studying how firm outcomes change when a firm gender diversifies its board. For their estimates to have a causal interpretation, firm-specific omitted variables such as corporate culture must not vary over the sample

[45] The difference (32%) falls within the 95% confidence interval of the quota's 3 year effect on board composition. See Column 2 of Table 3.

[46] A note of caution: California-based companies have the option of meeting SB826's 2021 requirement by hiring female directors after 12/31/2020. If these directors are less qualified than the directors hired during the sample period (10/1/2018 - 12/31/2020), then the conclusion from this section may be overturned.

[47] This conclusion would be consistent with my observation that female directors are less likely to be connected with incumbent leadership than their male counterparts (see Table 4).

period. Bernile et al. (2018) address a similar question but use an instrumental research design. They use the diversity of potential directors that live within a non-stop flight of a firm's headquarter as an instrument for board diversity. Through two stage least squares estimates, the authors find that increased board diversity results in better financial performance. My empirical analysis complements these two approaches to provide a more comprehensive understanding of how gender diversity affects firm outcomes.

Using a recent panel data set from 2010 to 2017, I study how firm outcomes change when firms transition to having gender diverse boards. Because changes in board composition must be exogenous to firm performance, I adopt an instrumental variables approach that takes advantage of shifts in the regulatory environment. California's SB826 mandated that companies have at least one woman on the board. In Section 4, I showed that firms with all-male boards prior to SB826 primarily responded to the legislation by adding female directors. Since these firms changed board composition to comply with SB826 (and not in response to changing corporate governance issues), I have an ideal experiment to assess how gender diverse boards affect firm performance.

Because gender quotas provide a laboratory to examine the effects of board gender diversity on firm outcomes, they have received much scrutiny from academic researchers. Ahern and Dittmar (2012) study Norway's requirement that female directors constitute at least 40 percent of the board. Within five years of the legislation's announcement, firms constrained by the quota had lower values, as measured by Tobin's Q. Like Norway, France instituted a board gender quota which required publicly listed firms to have at least 20% (40%) female directors by the end of 2013 (2017). Maghin (2022) studies the French context and finds that firms affected by the quota had higher total factor productivity (TFP) growth in the long-run. Other studies have examined Denmark's law that requires certain firms to have 40% female board representation (e.g. Chevrot-Bianco 2021).

Unlike the European context, the first stage of SB826 only requires that firms add one female director. The majority of US listed companies have fewer than two female directors, so modest changes in board composition due to SB826 more closely align with natural changes in board gender composition (see Figure 2). Further, Bennedsen, Perez-Gonzalez, and Wolfenzon (2007) find no value effects from director deaths in U.S. firms, implying U.S. firms have access to a large pool of qualified directors. If women constitute a sizable fraction of this pool, as suggested by Table **??**, then firms affected by SB826 should not experience value losses comparable to those observed in Norway.

6.1 Effects of Gender Diverse Boards on Firm Performance: OLS Estimates

Using the annual firm-year panel from 2010 - 2017, I study how firm outcomes evolve when firms transition to or away from having gender diverse boards.[48] Given that corporate boards may take actions that affect long-run firm viability (e.g. Mace 1972), I allow firm outcomes to be determined by lagged board composition. More specifically, my econometric specification posits that changes in board composition today can influence firm outcomes for the next four years:

$$Y_{fti} = \theta_0 + \sum_{k=-2}^{k=4} \delta^k \Big(GenderDiverseBoard_{f(t-k)i} \Big) + \delta_f + \delta_{ti} + \epsilon_{fti}, \tag{4}$$

Since I include many leads and lags of whether a company has a gender diverse board, Equation 4 is a "Distributed Lag" specification (Schmidheiny and Siegloch 2019). This specification is well suited to contexts where the binary treatment variable can turn on and off over the sample period. If the identifying assumptions hold, the δ coefficients represent the effect of an additional year of exposure to a gender diverse board. Since common practice is to report cumulative effects relative to an event, I use the following transformation suggested by Schmidheiny and Siegloch (2019):

$$\beta^{-1} = 0, \tag{5}$$

$$\beta^k = \sum_{j=0}^{k} \delta^j, k \geq 0 \tag{6}$$

$$\beta^k = \sum_{j=k+1}^{-1} -\delta^j, k < -1. \tag{7}$$

The standard errors of Equation 4 are clustered at the firm level to account for potential correlation of the error term within firms. The standard errors of the transformed variables ("event study coefficients") in Equations 5 - 7 are calculated using the Delta Method.

In order for the β coefficients to represent the cumulative impact of gender diverse boards on firm outcomes, the firm's board gender composition must be unrelated to the excluded variables from Equation 4. This assumption could be violated for a couple of reasons. For example, firms may be more likely to transition away from all-male boards when firm performance is poor. Ryan and Haslam (2005) find support for this hypothesis among 100 firms listed on the FTSE 100 in 2003. They document that firms who added women directors consistently had worse performance in the preceding five months than those that appointed

[48] As in previous sections, "gender diverse" boards refer to boards with at least 1 female director.

male directors. Firms may also add female directors as part of their broader Corporate Social Responsibility (CSR) efforts. If CSR activities can affect Firm Value (e.g. Jo and Harjoto (2011)), then estimates of the parameters in Equation 4 will be biased.

With these caveats in mind, I present estimates of the event study coefficients in Table **??**. Following the literature, I consider Market Value of Common Equity, Tobin's Q, and Return on Assets (ROA) as proxies of Firm Value. I define Tobin's Q as the ratio of Market Value to Book Value (e.g. Bharath et al. 2015), and ROA as Net Income divided by Total Assets. These outcomes are tracked at the end of each company's fiscal year or quarter. I measure operating performance based on Net Income and Book Value – the bottom line metrics on the income and balance sheet respectively.[49] The sample is restricted to firm-year observations with positive Assets and Book Value to ensure ROA and Tobin's Q have meaningful interpretations. I also consider the log of Book Value, Assets, and Liabilities because these variables are right-skewed and only take positive values. All domestic listed firms observed between 2010 - 2017 that fit the criteria described are included in the sample.[50]

Table **??** suggests companies did not transition to or away from gender diverse boards in response to prior changes in firm performance. Across all 12 outcomes, there is not a single "pre-event" coefficient that is statistically significant at conventional levels.[51] This result stands in contrast to Ryan and Haslem's findings in the European context. Moreover, Table **??** implies that gender diverse boards have an immediate and persistent impact in raising Market Value, Book Value, Assets, and Liabilities. In the preferred specification where I consider the log transform of these variables, $\hat{\beta}^0$ through $\hat{\beta}^4$ are all positive and statistically significant. The magnitudes indicate that gender diverse boards have an immediate impact in raising Market Value by 7%, Book Value by 11%, Assets by 9%, and Liabilities by 10%. These effects are not transitory since the magnitudes remain constant over time. I observe null effects for the Income Statement variables considered.

Taken at face value, Table **??** suggests that gender diverse boards swiftly and dramatically improve firm outcomes. An alternative reading is that growing firms adopt gender diverse boards. If the companies that gender diversify their boards would have experienced faster growth even absent changes in board composition, the parallel trends assumption permitting causal interpretations of Equation 4's estimates is not satisfied. This assumption is fundamentally un-testable and may be violated if changes in board composition coincide with changes in corporate objectives. Other studies exploiting shifts in board composition induced by gender quotas (e.g. Ahern and Dittmar (2012) pg 164, Bertrand et al. (2018) pg 48) show that changes in board

[49] I further examine the constituents of these metrics, which are Revenues, Cost of Goods Sold (COGS), Assets, and Liabilities.

[50] The eight-year sample window I use parallels the one used by AF (2008). They use an unbalanced panel of firms observed between 1996 - 2003. The authors argue that the relatively short panel makes the identifying assumptions of Equation 4 more plausible.

[51] In other words, $\hat{\beta}^{-3}$ and $\hat{\beta}^{-2}$ do not have p-values less than .1 for any outcome.

composition do not immediately impact firm outcomes.[52] Adams (2003) finds that boards of growing firms modify their behavior to devote more time to strategic issues. These observations lead me to favor the interpretation that companies on faster growth trajectories adopt gender diverse boards. More generally, these results question whether observational studies that compare firm outcomes before and after shifts in board composition can adequately capture causal effects.

6.2 Effects of SB826 on Financial Performance: IV Estimates

To address the limitations of the previous subsection, I examine how firm outcomes respond to the passage of SB826. Since the legislation *mandated* the addition of female directors, changes in board composition among quota-affected firms are arguably unrelated to shifts in corporate objectives – an omitted variable that potentially impacts both firm outcomes and board gender composition.[53] Therefore, difference-in-differences estimates that compare changes in firm outcomes between the treatment and control groups plausibly capture the causal effect of SB826.

Using the unbalanced firm-quarter panel from 2015 Q1 through 2020 Q4, I estimate the parameters of the following regression using OLS:

$$Y_{fti} = \gamma_0 + \sum_{t \neq 2017Q1} \beta^t \Big(1[Quarter = t] \times CA\ HQ_{2017} \Big) + \delta_f + \delta_{ti} + \epsilon_{fti}, \tag{8}$$

where Y_{fti} is a financial performance measure for firm f in quarter t and industry i. Following Lee and Mas (2008), I transform the outcome variable to be in percentile terms. More specifically, the outcome variable is the percentile rank among all firms in the sample in a given quarter. This statistic is useful in assessing the performance of a company relative to others in the sample.[54] Estimates of β^t will represent differences in financial outcomes between treatment and control firms in quarter t relative to 2017 Q1. As in Section 4, the Parallel Trends Assumption is necessary for the β coefficients to represent the effects of SB826. The other parameters have similar interpretations as in Equation 1.

Figure **??** displays results from the estimation procedure. The coefficients on the interaction terms prior to 2018 Q4 imply that firms in the treatment and control groups had similar financial trajectories prior to SB826.[55] Unlike the conclusions drawn from the previous subsection, Figure **??** does not imply that gender

[52] My instrumental variable results from Subsection 6.2 also suggest gender diverse boards do not instantaneously impact firm outcomes.

[53] The assertion that the addition of quota-appointed directors is exogenous to corporate objectives would be violated if companies that added female directors after SB826 would have adopted gender diverse boards even absent the legislation. However, the evidence in Section 4 documenting substantial compliance with the quota casts doubt on the critique.

[54] Using the percentile measure, Table 2 shows that treated firms, on average, are smaller than control firms in the 2017 cross-section.

[55] Out of the 126 regression coefficients with interaction terms prior to 2018 Q4, only 17 are statistically significant at the 10 percent level (13% of coefficients). The similar trajectories prior to SB826 adoption suggest, but do not prove, that the Parallel

diverse boards have an immediate impact on financial outcomes. In fact, the reduced form results generally suggest that the legislation had zero impact on financial outcomes in the 9 quarters after its implementation. The important exception is Market Value. Column 1 implies that the legislation *raised* Market Values of quota-affected firms within one quarter and that these positive effects persist over time. By the end of the compliance period (2019 Q4), the legislation raised quota-affected firms' percentile rank in the Market Value distribution by 2.2 points. To develop a sense of the magnitudes associated with Column 1's estimates, I re-run equation 8 using Log Market Value as the dependent variable. Within 5 quarters, SB826 appears to have raised the average Market Value of quota-affected firms by 17%. The fact that SB826 affected Market Value but no other financial measures may not be surprising. In a rational marketplace, the effects of events will immediately be reflected in security prices, while their effects on direct productivity related measures may require years of observation (MacKinlay 1997).

As a robustness check, I pool the post-treatment periods together and examine how SB826 altered the distribution of financial outcomes. I estimate the parameters of the following regression using quantile regression:

$$Y_{fti} = \beta^{\tau} * Treated_f * 1(t >= 2018Q3) + \lambda_{ti} + \alpha_f + e_{fti} \tag{9}$$

I consider $\tau \in \{0.25, 0.50, 0.75\}$ to study how SB826 affected the first, second, and third quartile of financial outcomes. I also estimate Equation 9's parameters through OLS. Since parameters estimated through quantile regression are less susceptible to outliers than those estimated via OLS, the outcome variables are not percentile transformed (Koenker 2001). Instead, I include all outcome variables in either log or level form.[56]

Table **??** displays results, and generally corroborates the conclusions suggested by Figure **??**. None of the metrics relating to operating performance are statistically significant. The assertion that SB826 raised the Market Value of quota-affected firms is reinforced; the point estimates from row 2 imply that SB826 increased market valuations of treated firms by 14% - 18% between 2018 Q3 and 2020 Q4. The magnitudes of these shifts are stable across the Market Value distribution. Positive and statistically significant estimates are also present for Market Value Returns (row 1) and Return on Assets (row 3). Interestingly, the legislation had a larger impact in shifting the 75th percentile of returns than the 25th percentile ($\hat{\beta}^{75} > \hat{\beta}^{50} > \hat{\beta}^{25}$). To check whether California-based companies with all-male boards are systematically more likely to grow in Market Value than non-CA-based companies with all-male boards, I implement the placebo regressions

Trends Assumption holds.

[56] I use the **rqpd** package in the R programming language to estimate the parameters of Equation 9. Homoskedastic standard errors are presented for parameters estimated via quantile regression.

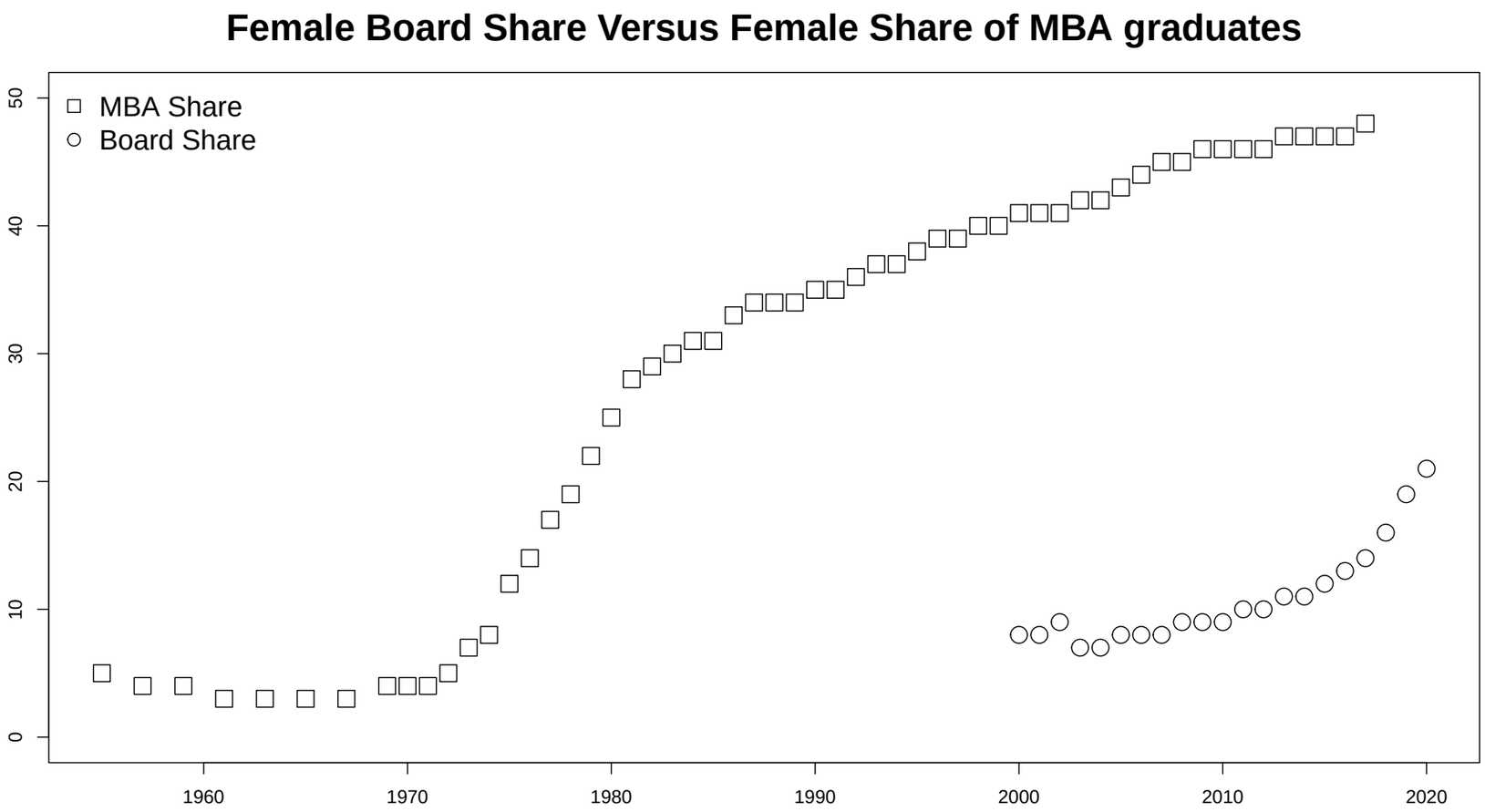
suggested by Stevenson (2010). Only the 2017 cohort of CA-based companies experienced abnormal returns, implying that the positive Market Value effects are not driven by differential growth trajectories between CA and non-CA-based firms. Event study estimates from a triple differences specification further support the theory that SB826 raised Market Values of quota-affected firms.

To summarize, the results from this section indicate that investors react positively to companies that gender diversify their boards. This finding is consistent with Byron and Post's (2015) meta-analysis, where they find that the relationship between female board representation and market performance is positive only in countries with greater gender parity. The companies that voluntarily transition away from all-male boards appear to be on faster growth trajectories. Further, SB826 did not have any deleterious impacts on operating performance in the 2 years after its implementation.

7 Conclusion

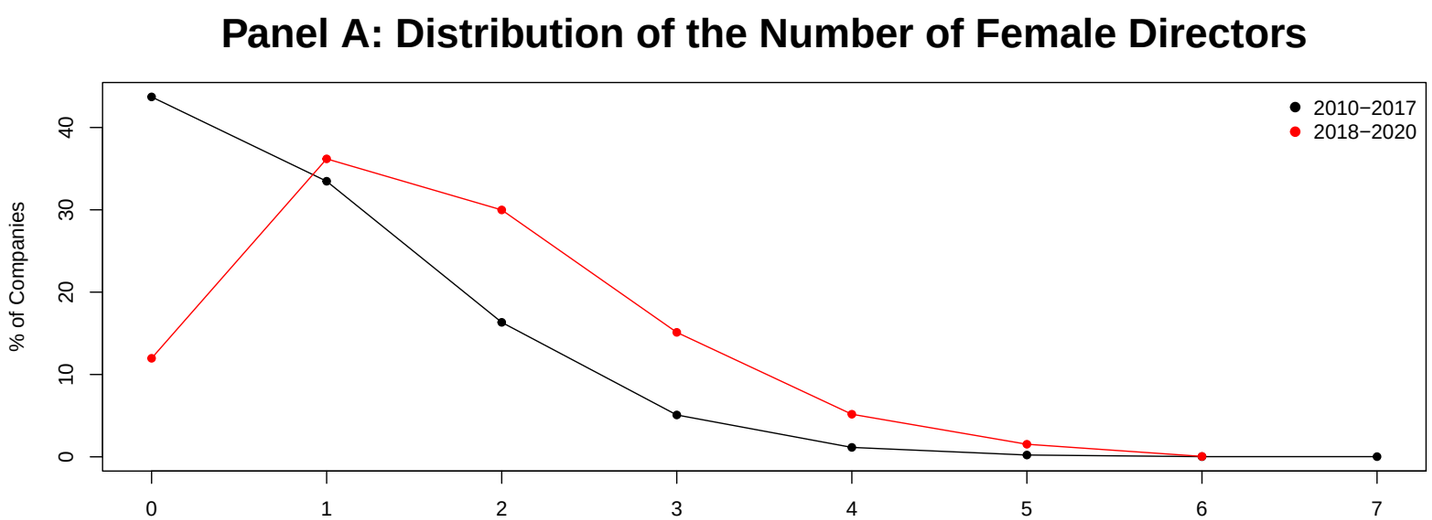
Investors reward companies that gender diversify their boards, but this paper does not answer why this phenomenon occurs. Do female directors contribute to firm productivity in ways not traditionally measured? Or do investors view companies with gender diverse boards as socially responsible actors? Related literature has argued that female directors improve collective board attendance and foster investment in fruitful Research and Development activities (Adams and Ferriera 2008; Bernile et. al. 2018), supporting the former view. In addition, a wave of research has documented that firms benefit from being socially responsible actors (e.g. El Ghoul et al. (2011); Gompers (2003); Fisman et al. (2003)), supporting the latter view. Both theories would help to explain existing rates of female board participation despite gender gaps in top-level experience.

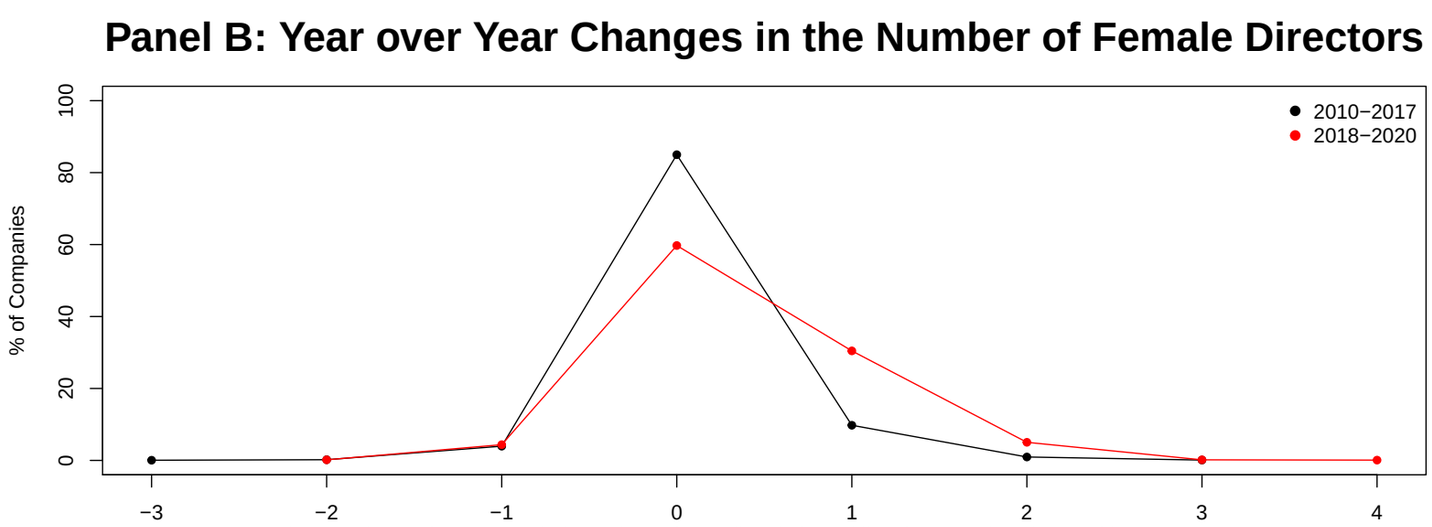
Figure 1



Female share of MBA graduates taken from NCES Table 325.25, which tracks postsecondary institutions participating in Title IV federal financial aid programs.
Female board share of domestic, listed companies derived from BoardEx.

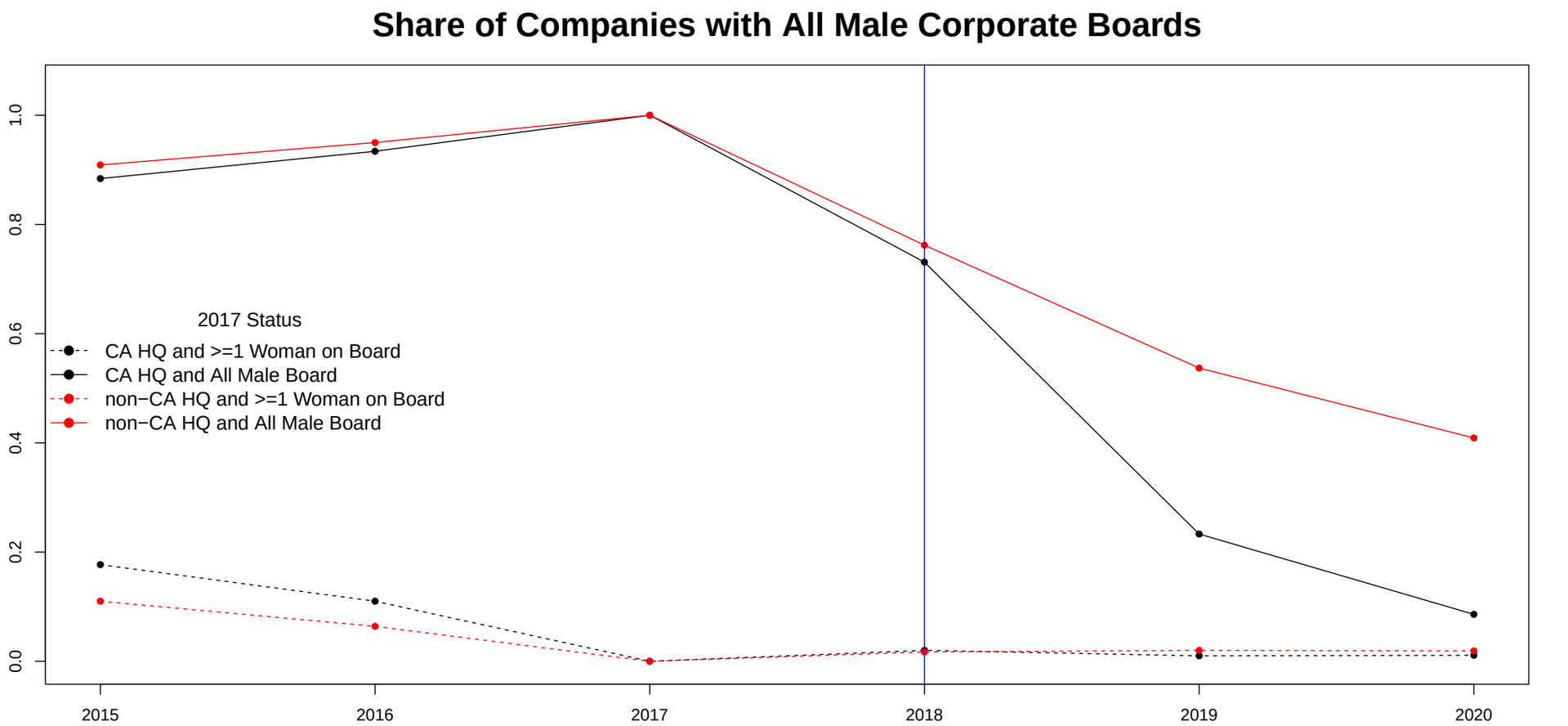
Figure 2





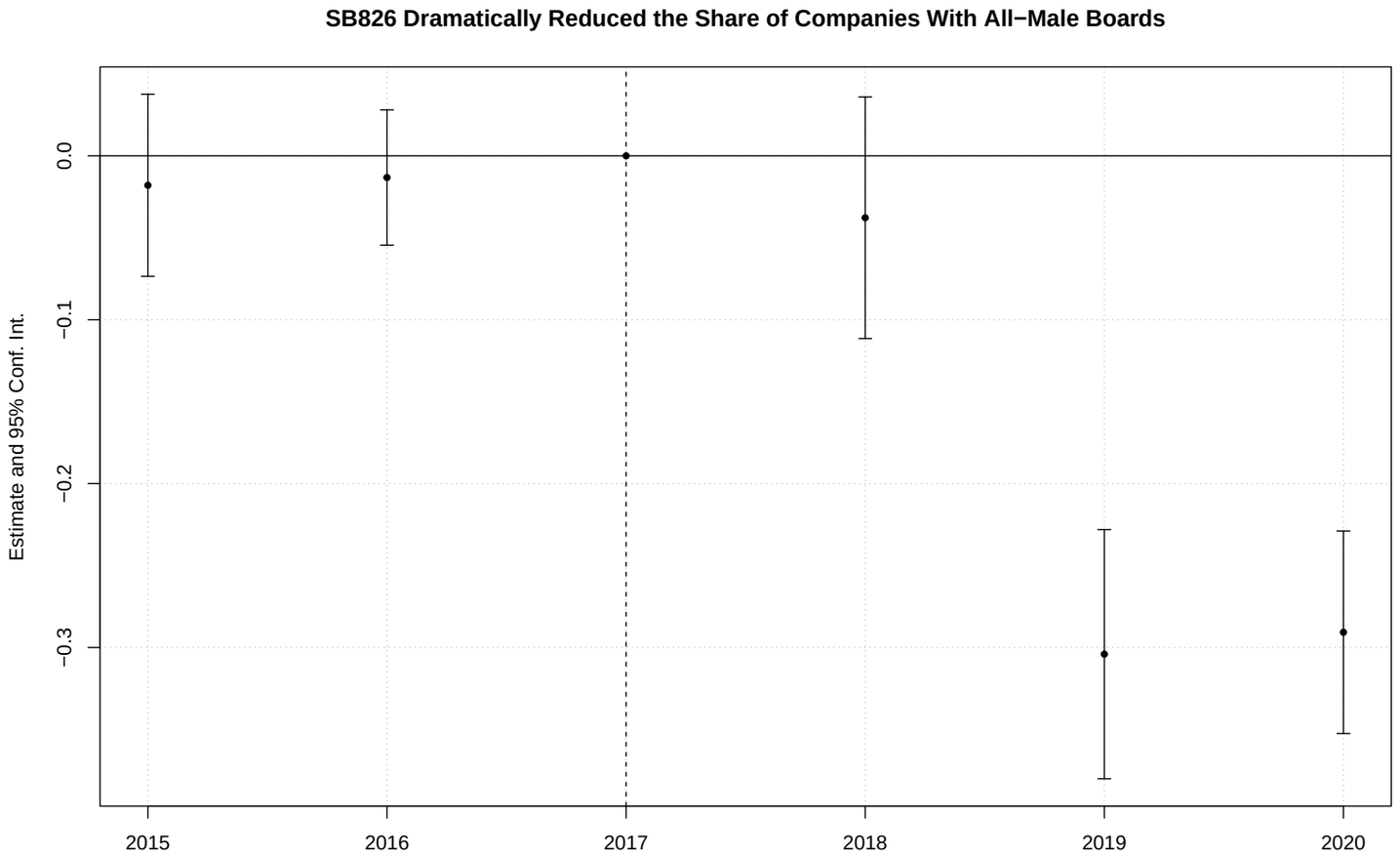
Note: The sample restricts to an unbalanced panel of California based listed companies observed between 2010−2020.
The gender composition of firms is provided by BoardEx, and historical headquarter location is provided by Compustat Snapshot.
CA SB 826, approved on 9/30/2018, mandated at least 1 woman be on the corporate board of any listed with HQ in CA by 12/31/2019.

Figure 3



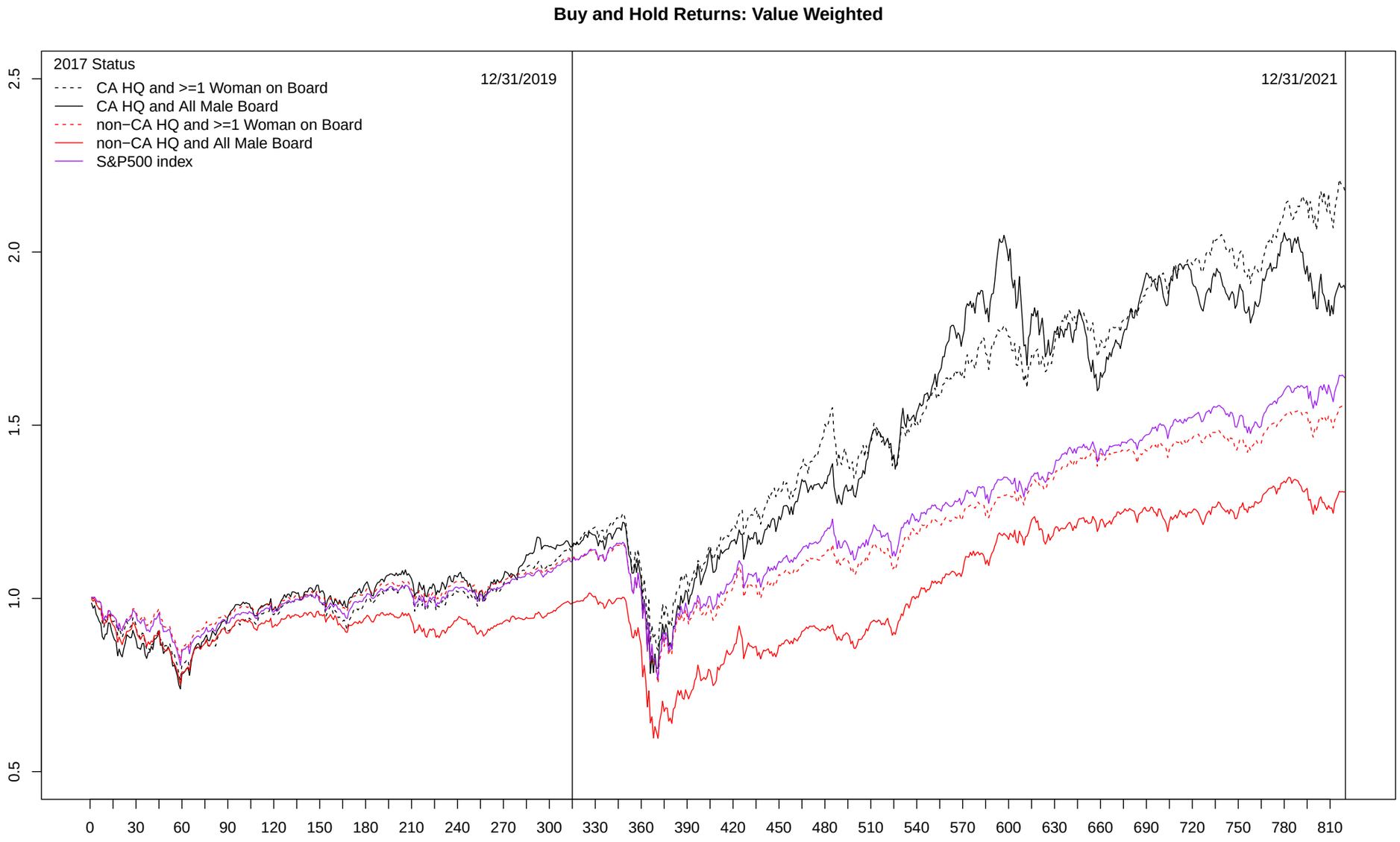
Notes: CA SB 826, approved on 9/30/2018, mandated at least 1 woman be on the corporate board of any publicly held company with HQ in CA by 12/31/2019. Publicly held corporations have shares listed on the NASDAQ, NYSE, or NYSE American. The sample tracks an unbalanced panel of firms that were domestic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

Figure 4



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 − 2020, with reported effects relative to the 2017 baseline. Standard errors are clustered at the firm level.

Figure 5



X Axis: Trading Days Relative to SB826.
The sample tracks an unbalanced panel of firms that were domestic and listed in 2017, the year before SB 826 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 SB826.

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

election of directors

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.

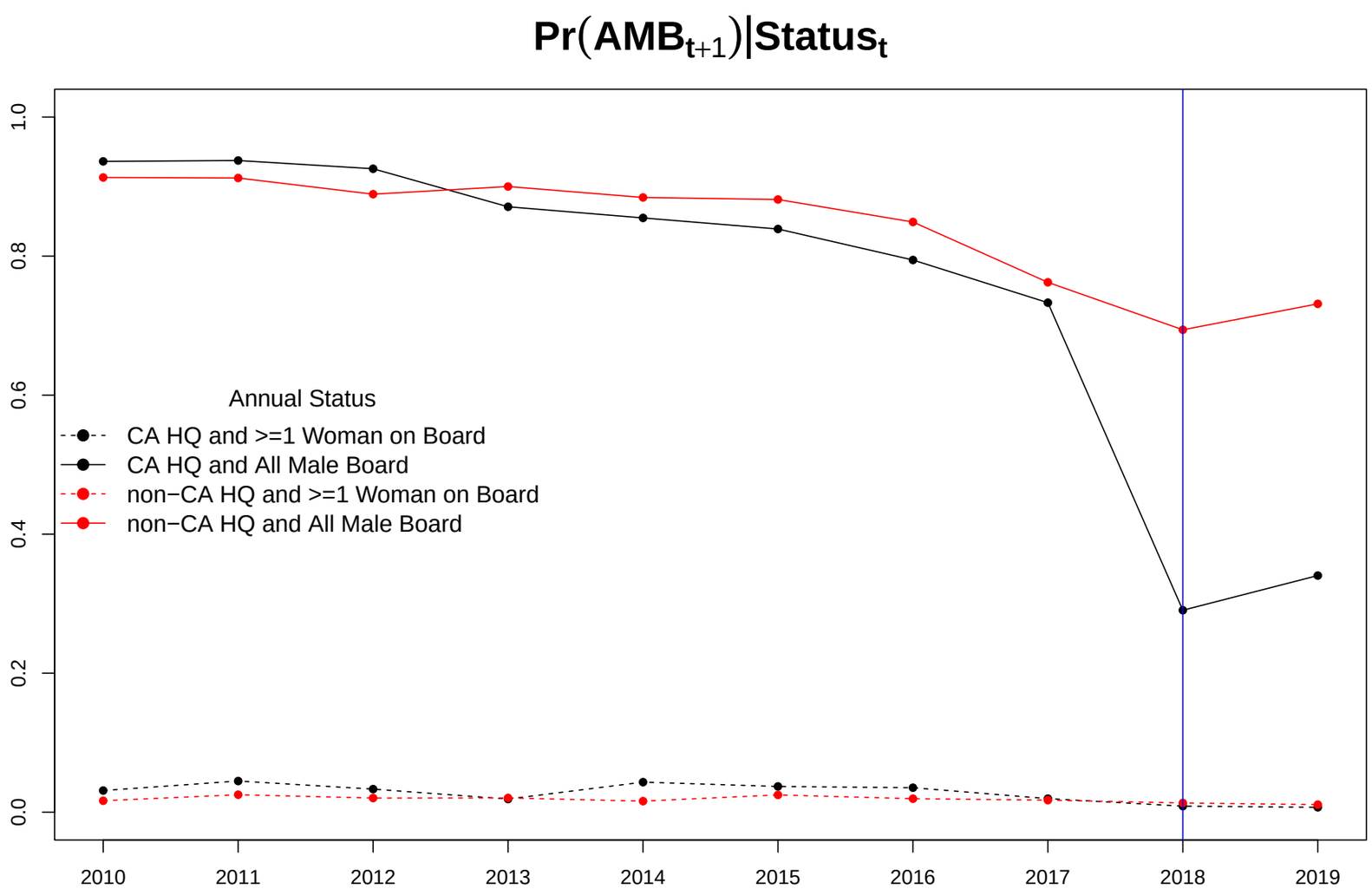
Global Business / International Affairs: Internationally recognized for her work in satellite and payload system acquisition, systems engineering, and system simulation. Former CEO of a company that provides space systems expertise to international organizations. Director of companies with international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

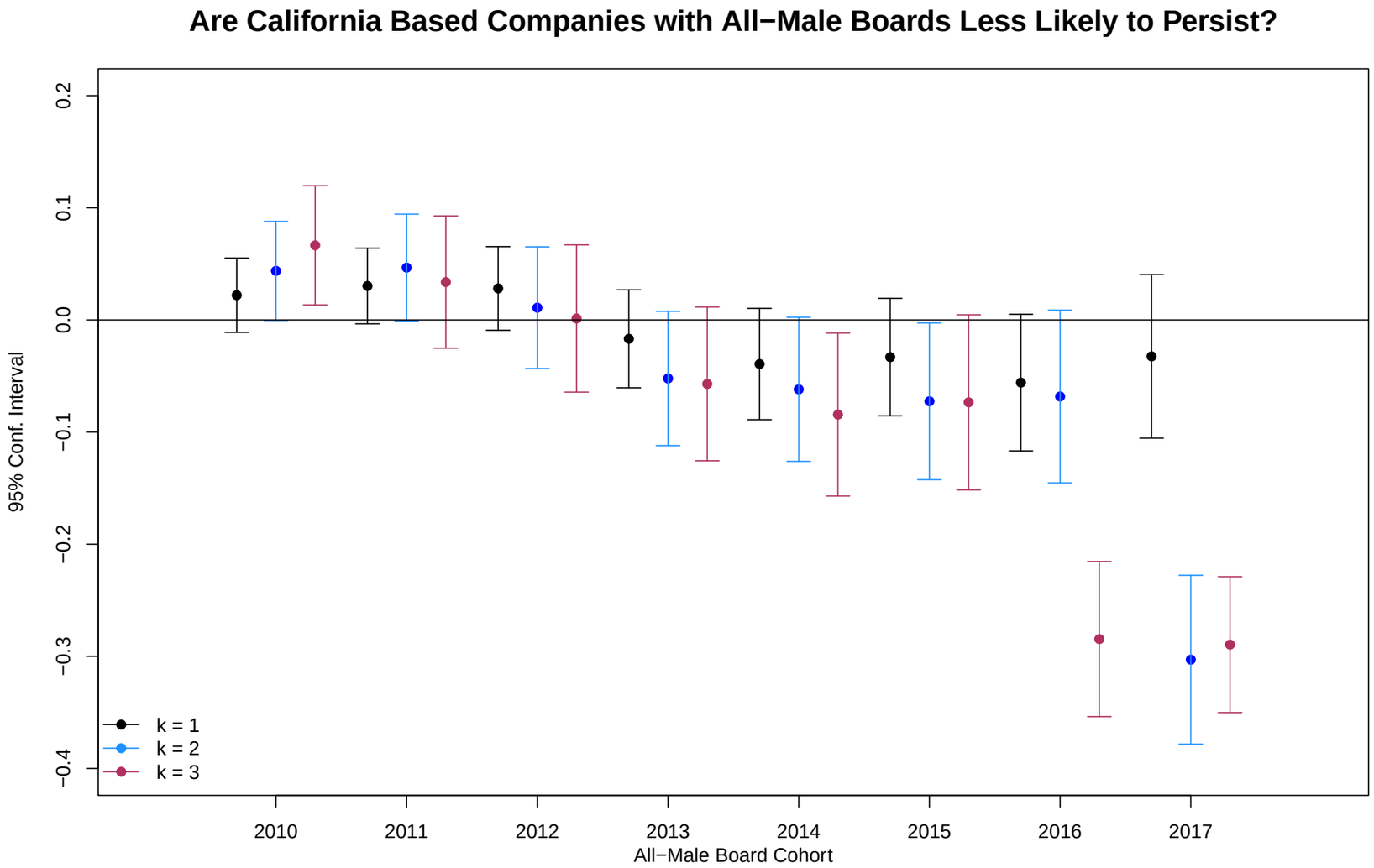
Research / Academia: Adjunct Research Professor at the University of Southern California's Viterbi School of Engineering. Former Interim President of the University of Southern California.

Figure A2



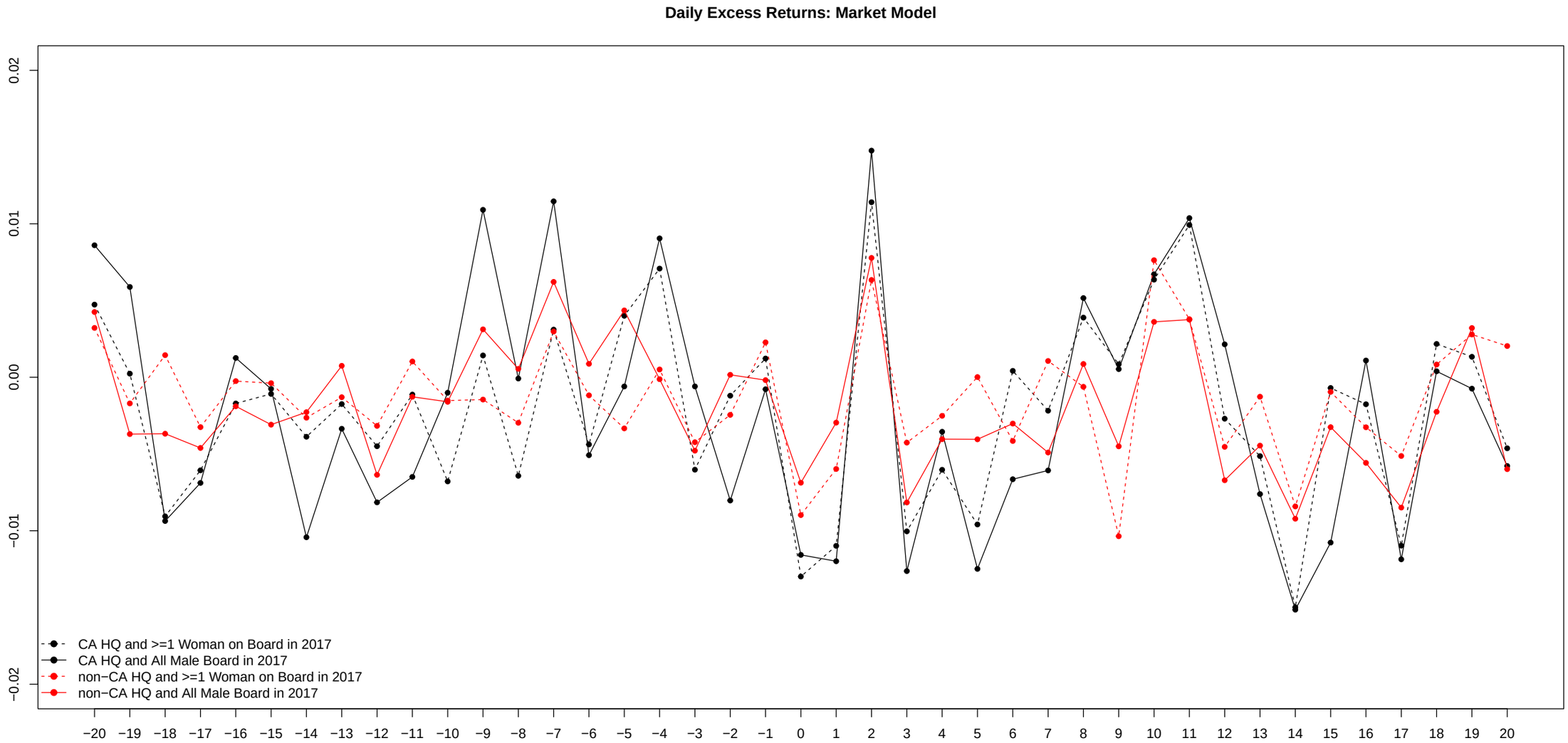
The sample restricts to domestic and listed companies where annual board gender information is available.
The annual board composition is provided by BoardEx. The universe of listed companies is provided by CRSP.
Annual headquarter information triangulated from Compustat, SEC reports, and BoardEx.

Figure A3



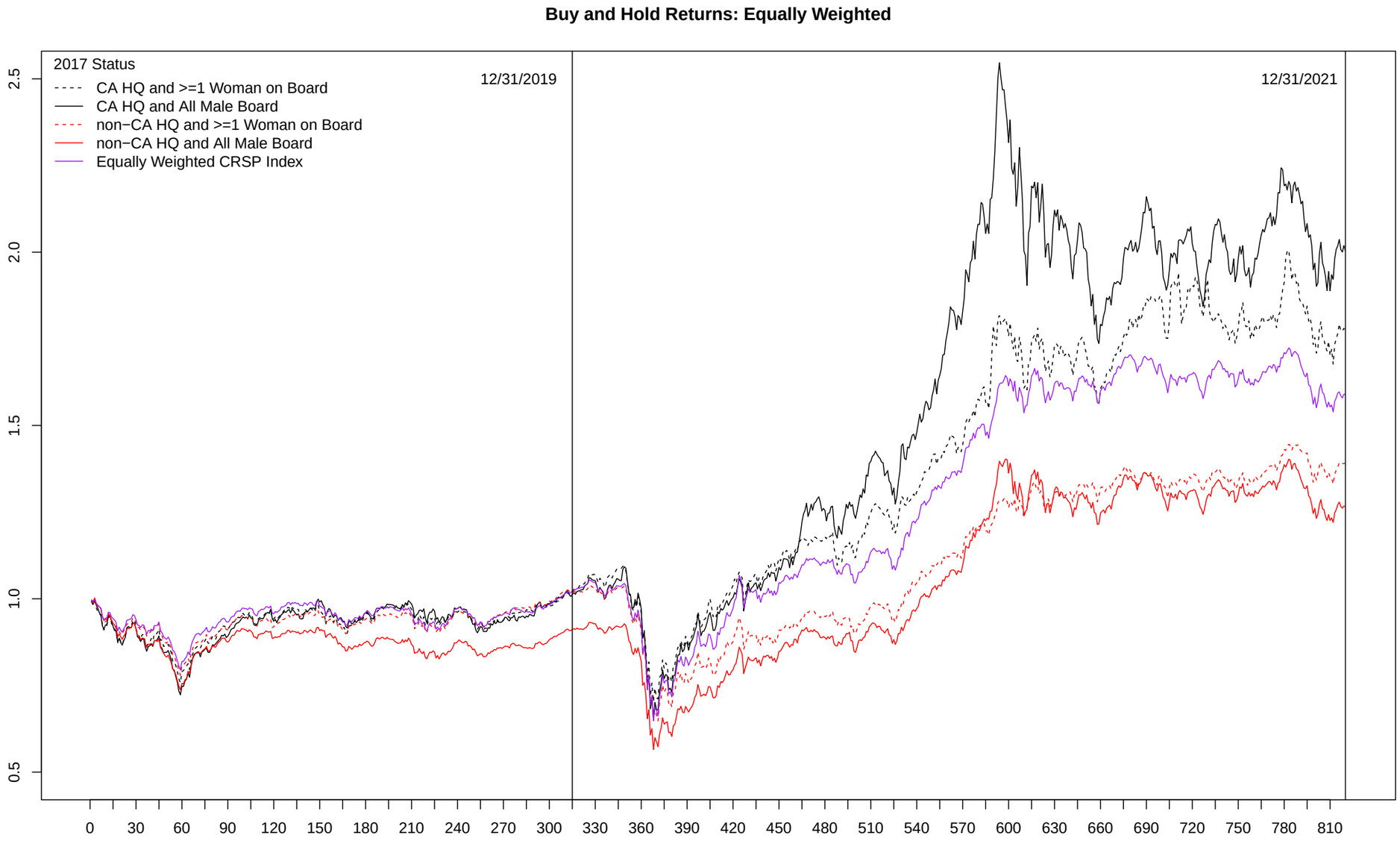
Note: Point estimates for cohort t represent β_{tk}: = Pr(AMB$_{t+k}$|AMB$_t$, CA HQ) − Pr(AMB$_{t+k}$|AMB$_t$, non−CA HQ)
CA SB 826, approved on 9/30/2018, mandated at least 1 woman be on the corporate board of any listed with HQ in CA by 12/31/2019.

Figure A4



Notes: CA SB 826, approved on 9/30/2018, mandated at least 1 woman be on the corporate board of any publicly held company with HQ in CA by 12/31/2019.

Figure A5



X Axis: Trading Days Relative to SB826.
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.

Table 1: Sample Size

Year	N: All Firms	HQ in CA			HQ outside of CA		
		N	N: AMB	Pr(AMB)	N	N: AMB	Pr(AMB)
2015	4011	663	266	0.40	3348	1133	0.34
2016	3871	648	243	0.38	3223	1020	0.32
2017	3845	643	204	0.32	3202	943	0.29
2018	3815	657	166	0.25	3158	760	0.24
2019	3791	670	59	0.09	3121	580	0.19
2020	3853	701	23	0.03	3152	471	0.15

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 2: 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
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 Age & Employees						
Age	16.07	19.21	-3.14	0.00	202	942
Employees (k)	0.79	1.99	-1.19	0.00	193	875
Firm Value Measures						
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
Income and Balance Sheet Measures						
Net Income	-10.65	28.78	-39.43	0.00	194	895
Log(Total Revenues)	4.05	4.63	-0.58	0.00	194	895
Log(Cost of Goods Sold)	3.56	4.19	-0.63	0.00	194	895
Shareholders Equity	240.58	551.00	-310.41	0.00	194	897
Log(Total Assets)	5.12	5.70	-0.59	0.00	194	897
Log(Total Liabilities)	4.29	4.91	-0.62	0.00	193	897
Log(Total Debt)	2.50	3.38	-0.88	0.00	184	824
Company Policies						
1(Merger)	0.00	0.01	0.00	0.94	204	943
1(Dividend)	0.14	0.36	-0.22	0.00	204	943
1(Incr in Shares Outstanding $\geq$ 10 percent)	0.02	0.03	0.00	0.80	204	943

Table 2: Firm Characteristics in 2017 *(continued)*

	CA-HQ	Outside CA-HQ	Diff	P-Value	N: CA-HQ	N: Outside CA-HQ
1(Decr in Shares Outstanding $\geq$ 10 percent)	0.05	0.04	0.01	0.74	204	943
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
Public Administration	0.00	0.00	0.00	NaN	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, are reported in millions, 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. To account for zero revenue, cost of goods sold, and debt values, one is added prior to the log transformation. 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. Company policies indicate if the event occured sometime during the calendar year, and are derived from CRSP's distribution codes. 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 3: Effects of the Gender Quota on Board Composition

Dependent Variables:	Male Share of Board	1(All-Male Board)	Board Size	1(Expand Board)	1(Male Dropped)
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
$CA_{2017} \times$ Year = 2015	-0.007	-0.042	0.119	-0.035	0.051
	(0.005)	(0.029)	(0.108)	(0.050)	(0.055)
$CA_{2017} \times$ Year = 2016	-0.0007	-0.005	0.050	-0.039	-0.009
	(0.003)	(0.021)	(0.084)	(0.045)	(0.053)
$CA_{2017} \times$ Year = 2018	-0.007	-0.029	0.056	0.031	0.029
	(0.006)	(0.036)	(0.087)	(0.055)	(0.055)
$CA_{2017} \times$ Year = 2019	-0.056***	-0.300***	0.216*	0.130**	0.0009
	(0.008)	(0.038)	(0.112)	(0.052)	(0.057)
$CA_{2017} \times$ Year = 2020	-0.078***	-0.298***	0.165	-0.030	0.060
	(0.008)	(0.032)	(0.124)	(0.051)	(0.060)
Fixed-effects					
Firm	Yes	Yes	Yes	Yes	Yes
Year-SIC	Yes	Yes	Yes	Yes	Yes
Fit statistics					
Observations	6,050	6,050	6,050	5,809	5,809
Dependent variable mean	0.960	0.755	6.87	0.222	0.413
Number of Firms	1,147	1,147	1,147	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 - 2020, with reported effects relative to the 2017 baseline. Standard errors are clustered at the firm level. 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. 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 4: 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 A8 for the full list of sectors. Experience and connections gained through work spells in non-listed companies are counted.

Table 5: Effects of the Gender Quota on Boardroom Characteristics

	Demographics			Experience			Connections				
Dependent Variables:	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)
Reduced Form											
$CA_{2017} \times$ Year = 2015	0.234	-0.007	-0.004	0.013	-0.002	0.006	0.004	0.013	-0.004	0.0007	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	-0.037	-0.0007	0.002	0.006	0.003	0.004	-0.006	-0.004	-0.007	-0.006	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	0.038	-0.007	-0.011	-0.004	-0.006	0.016*	-0.015	-0.003	-0.014	-0.022*	0.011*
	(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	-0.170	-0.056***	-0.015	-0.025**	-0.023*	0.003	-0.028*	-0.025*	-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	-0.112	-0.078***	-0.022	-0.033**	-0.029**	0.010	-0.026	-0.033**	-0.014	-0.054***	0.007
	(0.309)	(0.008)	(0.013)	(0.014)	(0.014)	(0.015)	(0.016)	(0.016)	(0.017)	(0.015)	(0.008)
2SLS											
$1(\widehat{GenderDiverseBoard})$	-0.608	-0.224***	-0.056	-0.111***	-0.089**	-2.05×10^{-6}	-0.079*	-0.102**	-0.045	-0.156***	0.016
	(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), 1(GenderDiverseBoard)	239.4	241.7	208.3	237.8	237.8	237.8	231.9	231.9	216.7	231.9	241.7
Observations	40,963	41,563	37,170	41,025	41,025	41,025	39,985	39,985	38,808	39,985	41,563
Dependent variable mean	61.8	0.956	0.354	0.760	0.619	0.454	0.529	0.354	0.428	0.512	0.807
Number of Firms	1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147	1,147

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. 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 A8 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 6: Growing Firms Adopt Gender Diverse Boards: OLS Results

Dependent Variables:	Log(Assets)	Log(Revenues)	Log(COGS)	Log(Liabilities)	Log(Employees)	Log(Market Value)	1(Dividend)	Board Size
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables								
1(*Diverse*) × Relative Year = -5 to -7	-0.078**	-0.083**	-0.054	-0.080*	-0.033**	-0.117**	0.004	0.097
	(0.034)	(0.038)	(0.046)	(0.044)	(0.016)	(0.046)	(0.016)	(0.069)
1(*Diverse*) × Relative Year = -4	-0.029	-0.036	-0.008	-0.047*	-0.023**	-0.064**	0.015	0.090*
	(0.023)	(0.027)	(0.032)	(0.028)	(0.010)	(0.033)	(0.012)	(0.050)
1(*Diverse*) × Relative Year = -3	-0.030**	-0.038**	0.004	-0.026	-0.012**	-0.059***	0.002	0.066*
	(0.015)	(0.015)	(0.020)	(0.017)	(0.005)	(0.021)	(0.010)	(0.036)
1(*Diverse*) × Relative Year = -1	0.029**	0.030**	0.070***	0.045***	0.017***	0.003	0.015*	-0.150***
	(0.013)	(0.013)	(0.015)	(0.016)	(0.005)	(0.018)	(0.008)	(0.033)
Fixed-effects								
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-SIC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fit statistics								
Observations	25,727	25,694	25,681	25,688	25,442	24,535	27,107	27,107
Dependent variable mean	6.78	5.85	5.23	6.07	1.18	6.45	0.481	8.39
F-test	2,947.8	2,539.6	1,934.0	2,416.9	5,120.8	1,367.8	443.1	538.4
Number of Firms	5,234	5,227	5,227	5,229	5,191	5,189	5,479	5,479

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

The sample restricts to an unbalanced panel of all domestic and listed firms between 2010-2017. Effects are relative to two years prior to the adoption of gender diverse boards. Relative periods more than 5 years prior to adoption are binned at 5 years. Diverse firms transition away from all-male boards sometime between 2010-2017. Firm-year observations including and after diverse firms adopt gender diverse boards are excluded. Further, observations with negative revenues and cost of goods sold are dropped. All firm-year observations are included for companies that do not adopt diverse boards during the sample period. Standard errors are clustered at the firm level. Columns 1-6 are derived from Compustat's annual fundamental files. Column 7 is derived from CRSP's Dividend file, while Column 8 and the diverse indicator are derived from BoardEx's organizational summary file. 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.

Table A1: Share of BoardEx Companies Matched with the Following:

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	BoardEx N	CRSP/ Compustat	Quarterly Financials	Listing Exchange	Geographic Identifiers	All of (2-6)
2015	4186	0.968	0.951	0.962	0.960	0.941
2016	4028	0.970	0.954	0.965	0.963	0.944
2017	3999	0.971	0.956	0.966	0.963	0.947
2018	3978	0.968	0.956	0.963	0.961	0.948
2019	3969	0.961	0.953	0.955	0.958	0.947
2020	4145	0.934	0.927	0.928	0.932	0.920

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. 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 A2: Non-Compliance, Evasion, and Attrition

	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
control	2015	722	75	797	NA	1	19
control	2016	804	46	850	53	5	17
control	2017	943	0	943	93	7	31
control	2018	654	202	856	-87	42	23
control	2019	430	367	797	-59	78	19
control	2020	300	435	735	-62	48	26

Note:
Treated firms have CA headquarterd and listed as of 2017, while control firms are listed and headquartered in another US state as of 2017. Columns 3-6 are derived from BoardEx's organizational summary files, which indicates a company's annual gender ratio. Attrition from BoardEx's organizational summary file 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. Column 7 is derived from CRSP's Delisting file, which indicates whether any of a company's securities delisted sometime during the year. The last column uses headquarter location data triangulated from Compustat Snapshot, BoardEx, and SEC filings.

Table A3: Gender Reporting Rates by Treatment Status

Year	CA-HQ	Non-CA-HQ	Diff	P-Val	N: CA-HQ	N: Non-CA-HQ
2015	0.85	0.85	0.01	0.78	174	797
2016	0.94	0.90	0.03	0.08	191	850
2017	1.00	1.00	0.00	1.00	204	943
2018	0.90	0.91	-0.01	0.65	183	856
2019	0.84	0.85	-0.01	0.81	171	797
2020	0.78	0.78	0.00	1.00	159	735

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 from BoardEx's organizational summary file 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 A4: Quota-Evasion and Form of Compliance

(a) Likelihood of Changing Corporate Form Between 2017 and 2020

Headquarter State	Share Delist or Chg HQ	Share delist	Share Chg HQ	N: Delist or Chg HQ	N: Delist	N: Chg HQ	N: All-Male Board
California	0.08	0.06	0.03	16	11	6	197
Outside of California	0.10	0.05	0.05	89	48	48	922

(b) Male Replacement vs Board Expansion Among Complying Companies

Headquarter State	Share Expand	Share Drop Men	Share Expand and Drop Men	N: Expand	N: Drop Men	N: Expand and Drop	N: Gender Diverse in 2020
California	0.77	0.85	0.63	116	128	94	150
Outside of California	0.76	0.85	0.61	358	396	286	468

Table A5: Growing Firms Adopt Gender Diverse Boards: Sun and Abraham Correction

Dependent Variables:	Log(Assets)	Log(Revenues)	Log(COGS)	Log(Liabilities)	Log(Employees)	Log(Market Value)	1(Dividend)	Board Size
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables								
1(*Diverse*) × Relative Year = -4 to -7	-0.025	0.003	0.005	-0.035	0.0007	-0.078**	-0.003	0.384***
	(0.030)	(0.031)	(0.035)	(0.033)	(0.013)	(0.034)	(0.011)	(0.053)
1(*Diverse*) × Relative Year = -3	-0.051**	-0.036	-0.008	-0.040	-0.026***	-0.108***	-0.013	0.169***
	(0.025)	(0.025)	(0.029)	(0.028)	(0.009)	(0.030)	(0.012)	(0.048)
1(*Diverse*) × Relative Year = -2	-0.022	-0.014	-0.040**	-0.029	-0.016***	-0.025	-0.014*	0.131***
	(0.014)	(0.016)	(0.018)	(0.018)	(0.005)	(0.020)	(0.008)	(0.034)
1(*Diverse*) × Relative Year = 0	0.045***	0.049***	0.043**	0.040**	0.020***	0.045**	0.010	0.845***
	(0.013)	(0.018)	(0.019)	(0.017)	(0.006)	(0.018)	(0.007)	(0.037)
1(*Diverse*) × Relative Year = 1	0.066***	0.070**	0.036	0.044*	0.022***	0.066**	0.021**	0.759***
	(0.020)	(0.027)	(0.029)	(0.027)	(0.008)	(0.028)	(0.010)	(0.050)
1(*Diverse*) × Relative Year = 2	0.075***	0.084**	0.065*	0.059*	0.040***	0.086**	0.028**	0.729***
	(0.029)	(0.036)	(0.038)	(0.036)	(0.012)	(0.038)	(0.013)	(0.061)
1(*Diverse*) × Relative Year = 3 to 7	0.076**	0.085*	0.076	0.037	0.058***	0.143***	0.026	0.764***
	(0.038)	(0.046)	(0.051)	(0.047)	(0.017)	(0.053)	(0.017)	(0.084)
Fixed-effects								
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-SIC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fit statistics								
Observations	15,620	15,592	15,593	15,579	15,381	14,942	16,281	16,281
Dependent variable mean	6.05	5.16	4.60	5.25	0.777	5.81	0.362	7.37
F-test	598.9	552.2	426.3	519.5	939.8	305.4	141.0	119.0
Number of Firms	2,879	2,873	2,874	2,877	2,848	2,859	2,981	2,981

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

The sample restricts to an unbalanced panel of all domestic and listed firms between 2010-2017. Effects are relative to on year prior to the adoption of gender diverse boards. Relative periods are binned at four years prior to adoption and three years after adoption. Diverse firms transition away from all-male boards sometime between 2010-2017. Firm-year observations among companies that always have gender diverse boards when observed are dropped. Further, observations with negative revenues and cost of goods sold are dropped. All firm-year observations are included for companies that do not adopt diverse boards during the sample period. Standard errors are clustered at the firm level. Columns 1-6 are derived from Compustat's annual fundamental files. Column 7 is derived from CRSP's Dividend file, while Column 8 and the diverse indicator are derived from BoardEx's organizational summary file. 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.

Table A6: Robustness Checks: Effects of the Gender Quota on Board Composition

Dependent Variables:	1(All-Male Board)							1(Expand Board)						
	Baseline	Size Control	Year FE	Dem. Subsample	AMB 2015-2017	Small Brd	Triple Diff	Baseline	Size Control	Year FE	Dem. Subsample	AMB 2015-2017	Small Brd	Triple Diff
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Variables														
Treated × Year = 2015	-0.018	-0.012	-0.039	-0.017	0.001	-0.017	-0.095***	-0.026	-0.030	-0.016	-0.041	-0.007	-0.041	-0.016
	(0.028)	(0.028)	(0.028)	(0.031)	(0.003)	(0.031)	(0.034)	(0.051)	(0.052)	(0.050)	(0.055)	(0.055)	(0.055)	(0.062)
Treated × Year = 2016	-0.013	-0.006	-0.019	-0.016	-0.0004	-0.016	-0.057**	-0.040	-0.045	-0.031	-0.050	-0.087*	-0.050	-0.012
	(0.021)	(0.021)	(0.020)	(0.023)	(0.002)	(0.023)	(0.026)	(0.047)	(0.047)	(0.045)	(0.051)	(0.048)	(0.051)	(0.058)
Treated × Year = 2018	-0.038	-0.037	-0.034	-0.047	-0.021	-0.047	-0.033	0.023	0.016	0.026	0.038	0.047	0.038	0.057
	(0.038)	(0.038)	(0.037)	(0.040)	(0.042)	(0.040)	(0.037)	(0.056)	(0.056)	(0.055)	(0.060)	(0.064)	(0.060)	(0.064)
Treated × Year = 2019	-0.304***	-0.302***	-0.307***	-0.333***	-0.311***	-0.333***	-0.294***	0.133**	0.132**	0.132**	0.098*	0.146**	0.098*	0.099
	(0.039)	(0.039)	(0.038)	(0.043)	(0.045)	(0.043)	(0.038)	(0.053)	(0.053)	(0.052)	(0.058)	(0.059)	(0.058)	(0.061)
Treated × Year = 2020	-0.291***	-0.287***	-0.323***	-0.325***	-0.318***	-0.325***	-0.314***	-0.028	-0.038	-0.008	-0.030	-0.045	-0.030	0.018
	(0.032)	(0.032)	(0.030)	(0.037)	(0.034)	(0.037)	(0.030)	(0.053)	(0.053)	(0.051)	(0.057)	(0.060)	(0.057)	(0.061)
Log(Assets)		-0.044***							0.037**					
		(0.016)							(0.016)					
Fixed-effects														
Firm	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
Year-1 digit SIC	Yes	Yes		Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	
Year			Yes							Yes				
1(CA HQ)-Year							Yes							Yes
1(AMB)-Year							Yes							Yes
1(CA HQ)-1(AMB)							Yes							Yes
Fit statistics														
Observations	5,873	5,759	5,911	3,431	4,709	3,431	20,839	5,650	5,540	5,681	3,294	4,652	3,294	20,284
Dependent variable mean	0.757	0.756	0.757	0.749	0.794	0.749	0.244	0.220	0.222	0.220	0.223	0.210	0.223	0.251
Number of Firms	1,147	1,131	1,147	687	866	687	3,845	1,139	1,122	1,139	676	866	676	3,829

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 - 2020, 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. Cols 1-3 subsets to companies that had all-male boards in 2017. Col 4 further subsets to firms headquartered in Democratic states – states that voted for Hillary Clinton in the 2016 presidential election. Col 5 only considers companies that had all-male boards from 2015-2017. Col 6 subsets to companies that had fewer than 7 directors (the median board size) in 2017. Col 7 makes no additional restrictions. 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 A7: 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
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 A8 for the full list of sectors. Directors may hold multiple positions. Some directors have missing characteristics.

Table A8: Number of Active Female Leaders with Top-Level Experience

Sector	Any Position	Board Position	C-Suite Position	N: Treated Firms
Pharmaceuticals and Biotechnology	734	304	177	40
Software and Computer Services	712	243	118	22
Health	358	204	75	20
Information Technology Hardware	248	87	45	20
Electronic and Electrical Equipment	359	226	45	14
Real Estate	351	251	47	9
Business Services	363	185	58	8
Telecommunication Services	226	84	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	168	84	31	5
Renewable Energy	45	31	5	5
Speciality and Other Finance	472	213	76	4
Beverages	77	28	18	3
Clothing and Personal Products	192	109	30	3
General Retailers	421	219	93	3
Containers and Packaging	40	28	5	2
Insurance	324	158	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	112	90	10	1
Leisure and Hotels	381	208	79	1
Leisure Goods	45	29	6	1
Oil and Gas	233	142	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. Variables derived from Boardex's employment history files, which tracks the work histories of board members. Sector classification provided by BoardEx.

Table A9: Effects of the Gender Quota on Firm Policies

Dependent Variables:	1(Delist)	1(Merger)	1(Dividend Issued)	1(Shares Out. Dcr by $\geq 10\%$)	1(Shares Out Inr by $\geq 10\%$)
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
$CA_{2017} \times$ Year = 2015	-0.022*	-0.002	0.002	-0.002	-0.005
	(0.011)	(0.006)	(0.021)	(0.016)	(0.023)
$CA_{2017} \times$ Year = 2016	-0.019*	-0.0004	-0.011	0.016	0.022
	(0.011)	(0.006)	(0.016)	(0.022)	(0.030)
$CA_{2017} \times$ Year = 2018	-0.013	-0.010	-0.002	0.005	0.013
	(0.017)	(0.012)	(0.012)	(0.017)	(0.025)
$CA_{2017} \times$ Year = 2019	-0.023	0.003	0.016	0.016	-0.006
	(0.023)	(0.018)	(0.016)	(0.021)	(0.025)
$CA_{2017} \times$ Year = 2020	-0.0009	-0.003	0.020	0.013	-0.006
	(0.022)	(0.016)	(0.022)	(0.020)	(0.025)
$CA_{2017} \times$ Year = 2021	0.003	0.018	0.0002	-0.0006	-0.004
	(0.023)	(0.021)	(0.025)	(0.018)	(0.023)
Fixed-effects					
Firm	Yes	Yes	Yes	Yes	Yes
Year-SIC	Yes	Yes	Yes	Yes	Yes
Fit statistics					
Observations	7,339	7,339	7,339	7,339	7,339
Dependent variable mean	0.036	0.023	0.327	0.033	0.052
Number of Firms	1,147	1,147	1,147	1,147	1,147

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

The sample restricts to all firms that were domestic, listed, and had all-male boards in 2017. Treated firms have CA headquarters and all-male boards as of 2017. The time period covered is Jan 1st 2015 - Dec 31st 2021, with reported effects relative to 2017. Standard errors clustered at the firm level. All outcome variables derived from CRSP Events files. Indicator variables equal one if the company has at least one security that meets the criteria sometime during the year. 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.