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Gender Stereotyping by Location, Female Director Appointments and Financial Performance

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Abstract
We investigate whether female board representation and firms' financial performance are related and whether the relationship differs for firms located in more prejudicial environments. As a proxy for prejudicial environment, we use two geographical indicators: (1) whether a firm is headquartered in a conservative "red" state (which tends to vote for Republican candidates) or in a liberal "blue" state (which tends to vote for Democratic candidates) and (2) whether the firm is located in regions where residents possess more stereotypical attitudes about gender equality. We find that both financial performance and female board representation are lower for firms headquartered in red states when compared to those in blue states, and we find similar results for firms located in regions where residents hold more gender-stereotypical views. However, financial performance improves when female directors are present regardless of the firm's location. Evidence also shows that the incremental improvement in performance measured by Tobin's q is greater in red-state than in blue-state companies and in regions where residents hold more gender-stereotypical views. The overall results imply that gender stereotyping holds back financial performance and that female directors help improve financial performance.

Keywords Firm performance · Female directorship · Gender stereotyping

Introduction

Women are underrepresented on corporate boards in the United States. According to a recent statistic, women hold 18.8 percent of the board seats on Fortune 1000 companies in 2016.[1] This small share of female membership is startling, considering that females accounted for 50% of the college-educated labor force in 2016 (Bureau of Labor Statistics).[2] While a number of economic and demographic factors can explain the low female representation on corporate boards, some critics have suggested that a type of gender screening is occurring. According to the U.S. Federal Glass Ceiling Commission chaired by the then-U.S. Labor Secretary Robert Reich, there exist "artificial barriers to the advancement of minorities and women in the private sector that contradict this nation's ethic of individual worth and accountability" (p. 7).[3]

There is an almost universal perception that corporate boards benefit from greater diversity and that the presence of females on boards could enhance financial performance (Burke 1997).[4] Clearly, one can make an ethical case that a

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[1] https://www.2020wob.com/companies/2020-gender-diversity-index.

[2] Women in the labor force: a databook: BLS Reports: U.S. Bureau of Labor Statistics. November 2017.

[3] "*A Fact-Finding Report of the Federal Glass Ceiling Commission*," Washington, D.C., March 1995.

[4] According to a McKinsey survey of top executives, almost nine out of ten CEOs agreed that tapping into female talent is important for "getting the best brains" and competing in markets where females

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greater social purpose is served by having more females on corporate boards as argued by the Glass Ceiling Commission and other ethics scholars (e.g., Burke 2000; Oakley 2000). However, scientific evidence for making a "business case" (i.e., female board membership enhances corporate financial performance) has not been robust, and it is often ambiguous (Adams and Ferreira 2009; Apesteguia et al. 2012; Simpson et al. 2010). The main hurdle, from an empirical standpoint, is endogeneity; that is, financial performance and female directorship (board composition) can be jointly and endogenously determined (Adams et al. 2010; Hermalin and Wesibach 2003). If so, then it is unclear whether a firm performs better because female directors are present or whether well-performing firms tend to appoint more females on their boards (Apesteguia et al. 2012).

In this study, we revisit the performance–gender link, or lack thereof, from a different perspective. We examine whether gender stereotyping suppresses financial performance and whether hiring female directors improves performance. We also examine whether financial performance improvement is more (or less) pronounced when female director hiring occurs in a more prejudicial environment.

Credible proxies for prejudicial environment are difficult to find. The first proxy we use is the location of the company headquarters: whether it is in a "red" state (which tends to vote for Republican candidates) or in a "blue" state (which tends to vote for Democratic candidates). From a conceptual standpoint, there is already a well-established link between sexism and political conservatism in the social psychology literature (Federico and Sidanius 2002; Jost et al. 2003). Such a link gives rise to a hypothesis that a varying degree of gender screening manifests itself as differences in director-hiring practices between red-state and blue-state companies, and also affects corporate performance. We delineate between red and blue states based on the past five presidential elections between 1996 and 2012 and the margin of votes cast for Republican versus Democratic presidential candidates.

A second proxy is a survey result from the General Social Survey (GSS; University of Chicago), which addresses individuals' attitudes toward women's roles in the workplace. In particular, we use the percentage of U.S. residents who responded that, "Home is better if the man is the achiever outside the home and the woman takes care of the home and family" (GSS code *FEFAM*). Regions where a higher percentage of residents said 'yes' to this survey question are treated as more prejudicial against females. To assess whether sexist prejudicial beliefs differ from other stereotypes such as racial prejudice in terms of their outcomes, we also use the GSS survey results to a question on racial typecasting: "Do you think African-Americans have less inborn ability to learn?" (GSS code *RACEDIF2*).

We then examine three interconnected research questions. First, does female board representation vary systematically across these regions? This question is a useful starting point because if regions are a useful proxy for sexism, then we anticipate that female board representation, or potentially financial performance, is lower in more gender-stereotypical regions (e.g., in red states when compared to blue states). Second, does the presence of a female director impact financial performance? Third, in firms with a female director, does the extent of performance improvement differ between regions with more and less discriminatory attitudes toward gender equality?

We use the instrumental variable approach to test whether financial performance varies across different regions which differ in the degree of prejudicial social attitudes. We use firm-fixed effects models to test whether financial performance improves after a female director is hired, and whether the improvement differs between more and less prejudicial regions. The fixed-effects approach mitigates the confounding effects of omitted variables at the firm level and thus helps facilitate causal inference.

This investigation focuses on director composition between 1996 and 2014 taken from the RiskMetrics database (formerly known as the Investor Responsibility Research Center: IRRC), which provides information on the boards of directors for S&P 1500 companies (S&P 500, S&P MidCap 400, and SmallCap 600). These firms represent approximately 85% of the market capitalization of all publicly traded firms.

Results indicate that female board representation is indeed consistently lower in "red companies" (firms headquartered in red states) than in "blue companies" (firms headquartered in blue states) and in firms located in regions where residents hold more stereotypical gender beliefs. More importantly, we find that corporate performance also differs between firms located in red states than in blue states, and the results are similar when regions are delineated by the residents' attitude toward gender equality based on the GSS survey. Results also suggest that the extent of incremental performance improvement varies by regions. Taken together, these results indicate that prejudice holds back corporate financial performance and that female director appointment impacts financial performance.

We organize the remainder of the study as follows: Sect. "Gender barriers in boardrooms" reviews the extant literature on the source of gender gaps in boardrooms. Section "Data and methodology" explains the data and methodology, while Sect. "Results" reports the results. Finally, Sect. "Discussion and Conclusions" provides discussion and offers conclusions.

Footnote 4 (continued)

make most of the purchasing decisions ("Women in the Economy," Wall Street Journal, May 7, 2012).

Gender Barriers in Boardrooms

Regional Differences in Prejudicial Beliefs and Labor Market Outcomes

The selection of board members, especially the selection of female board members by corporations, is a "black box" (Groysberg and Bell 2013).[5] According to the Wall Street Journal, females initially secure 47–53% of entry-level positions, but they become increasingly underrepresented further up the corporate ladder.[6] Specifically, female representation rapidly declines to 35% at the senior-manager level, drops to 24% at the vice-president level, and to 19% at the executive or director level.[7] This well-known "pipeline" problem (Bertrand 2009) partially explains the overall under-representation of females at the board level, but it does not predict that female representation differs between conservative/liberal states or whether the uneven female representation is related to gender preference.

The premise that female representation would be lower on boards of firms in conservative states (relative to liberal ones) is based on previous research in social science that establishes a link between sexism and political conservatism (Federico and Sidanius 2002; Jost et al. 2003). More specifically, the social psychology literature indicates a consistent link between conservatism and racism, sexism, and sexual prejudice (Federico and Sidanius 2002; Jost et al. 2003; Reyna et al. 2006; Wetherell et al. 2013). For example, Jost et al. (2003) argue that two core dimensions of political conservatism are resistance to change and acceptance of inequality, and they also hypothesize a link between sexism and conservatism.[8] While "hostile sexism" is unlikely, one cannot rule out the existence of a subtle form of gender screening, which is consistent with "benevolent sexism" (Glick and Fiske 1996)[9] or implicit discrimination (Bertrand et al. 2005). In labor economics, a recent study by May and McGarvey (2017) examines geographical differences in occupational segregation delineated by red and blue states in male-dominated occupations. This study finds that women are more fully integrated into the labor market in high-education, male-dominated fields in blues states than in red states. The study thus demonstrates that there are significant differences in labor market outcomes for women, in association with differing social attitudes in red versus blue states.

Another interesting reference point is a recent study by Pew Research Center, which reports a striking partisan difference in opinion about the existence of sexism in America.[10] For example, 75% of Republican-leaning males think that obstacles against women to get ahead are largely gone, whereas only 39% of Democratic-leaning men think so. The corresponding percentages for females are 50% for Republican-leaning, and 23% for Democratic-leaning females. If their perceptions are based on reality, then we expect to observe more female directors on corporate boards in red-state than in blue-state companies. The reality is the opposite, however, because we find that firms in Republican-leaning red states employ significantly fewer female directors than firms in blue states.[11] Thus, the Pew survey reveals an interesting chasm between political partisan beliefs and perspectives on gender equality that is not entirely consistent with reality. Regarding the scientific evidence of discriminatory labor practices, Janssen et al. (2016) analyze the relationship between discriminatory social attitudes toward gender equality and the firm's gender wage gaps. The study finds a strong relationship between discriminatory social attitudes and gender pay gaps, even after controlling for unobserved firm heterogeneity.

A more pressing issue is whether financial performance also differs by company location. Gender preference towards males leads firms to hire more male directors (and less female directors) than profit maximization would imply. Such preferences are equivalent to an additional cost to the firm (Becker 1957; Arrow 1971) and is costlier for more prejudicial firms (Hellerstein et al. 2002). Suboptimal hiring practices influenced by other prejudicial beliefs such as race (e.g., a perception that blacks have less in-born ability to learn) would also have a similar adverse outcome. As a result, the following hypothesis, in the null form, applies:

Hypothesis 1 Corporate headquarter location in red and blue states, or between regions with differing views on gender equality, is an irrelevant factor in financial performance.

The alternative hypothesis is that corporate headquarter location *is* relevant for financial performance, since it

[5] See Doldor, Vinnicombe, Gaughan, and Sealy (2012) for a review of the director search and appointment process.

[6] "Women in the Economy," Wall Street Journal, May 7, 2012.

[7] Similar statistics are reported by Catalyst, Inc. (a non-profit research organization), which reports that 37% of the middle managers are females in large American firms. This percentage drops to 28% at the senior manager level and then to 14% at the executive/director level.

[8] Notice that their argument does not mean that liberals do not discriminate but that conservatives are more likely than liberals to discriminate against certain groups.

[9] Benevolent (in contrast with hostile) sexism (Glick and Fiske 1996) is a set of "attitudes toward women that are sexist in terms of viewing women stereotypically but that are subjectively positive in feeling and tone (for the perceiver)."

[10] See http://www.pewresearch.org/fact-tank/2016/08/16/in-both-parties-men-and-women-differ-over-whether-women-still-face-obstacles-to-progress/.

[11] The results are reported in Sect. "Results".

embodies the social and cultural norms and preferences of key players (i.e., the board and the CEO) who make major strategic decisions (Di Giuli and Kostovetsky 2012; John et al. 2011; Pirinsky and Wang 2006).

Impact of Female Directors on Financial Performance

Academic research motivates greater female representation on corporate boards from two angles: ethical and economic. The ethical argument asserts that it is immoral to deny women from reaching the highest echelons of business because of sexist preferences (Campbell and Minguez-Vera 2008). Eyring and Stead (1998) summarize this sentiment as "when women and minorities follow the same paths of education and work experience, it is simply unjust to stand in their way." From an ethical standpoint, therefore, gender diversity is itself a desirable goal rather than a means to an end of maximizing firm value (Burke 2000; Brammer et al. 2007). The second argument is purely economic, stating that excluding women is not only poor corporate governance but also a misuse of high-level human capital and is therefore detrimental to firms' financial performance (Burke 1997; Bilimoria 2000).

Despite the overwhelming public support for making an ethical case, empirical evidence on making a business case has been inconsistent and often nebulous. For example, Erhardt et al. (2003) report that return on assets (ROA) and return on investment (ROI) are positively correlated with the percentage of females and minorities on boards in their study of 127 large U.S. companies from 1993 to 1998. Carter et al. (2003) also document a significant positive relationship between the fraction of females and minorities on boards and firm value (Tobin's q) for Fortune 1000 firms in 1997. However, more recently, Adams and Ferreira (2009) report that the fraction of female directors is *negatively* correlated with firm value (Tobin's q) and accounting performance (ROA).[12]

In an international setting, Campbell and Minguez-Vera (2008) examine the financial performance of Spanish firms from 1995 to 2000 and find a significant positive association between female board membership and Tobin's q. In contrast, Rose (2007) reports no significant relationship between female board representation and financial performance (Tobin's q) for Danish firms from 1998 to 2001. This is somewhat surprising because Denmark was among the first to liberalize female participation in boardrooms. In another paper looking into the impact of mandatory gender quotas, Ahern and Dittmar (2012) report that the stock market responded negatively to Norwegian firms, which were subject to a mandated gender quota (40%) in their boardrooms. Matsa and Miller (2013) compare financial data for listed firms in Norway with a matched sample of unlisted firms before and after the introduction of the 2006 gender quota. They report that major corporate decisions, other than employment policies, did not change after firms increased female board representation, but the operating profits to assets ratio declined by about four percentage points. Finally, Sun et al. (2011) are unable to find evidence that greater presence of female directors on the audit committee mitigates earnings manipulation by managers.

A unique feature of our study is that we combine the locational differences that represent varying degrees of prejudicial beliefs with the associated labor market outcomes (female director appointment). In so doing, we can determine jointly whether financial performance improves for firms that have female directors and whether such improvement is greater/less for firms operating in a more/less prejudicial environment. Thus, the first of the following two related hypotheses applies:

Hypothesis 2 There is no improvement in financial performance when a female director is present.

To the extent that financial performance does improve, the next hypothesis addresses whether the extent of such improvement differs between regions that hold more/less gender-stereotypical views.

Hypothesis 2a The improvement in financial performance is no different between red-state and blue-state firms or between regions with differing views on the role of women.

Whether performance benefit from having female directors on boards is larger in a more prejudicial environment is unclear, ex ante. On one hand, tokenism and prejudicial board culture can hamper the proper functioning of female directors. If so, performance improvement can be more limited in red-state firms when compared to blue-state firms. Stephenson and Raskow (1993) suggest that a lone female director with little business experience is unlikely to have much influence in boardrooms dominated by male directors. Nosek et al. (2009) report that implicit stereotypes and gender differences in science performance are mutually reinforcing, contributing to the persistent gender gap in science participation and performance.[13]

[12] They did find that gender-diverse boards are more likely to hold CEOs accountable for poor stock price performance and that directors on gender-diverse boards have higher attendance rates and receive relatively more equity-based compensation.

[13] See, also, Guiso et al. (2008) who report that the male–female gender gap in math test performance is significantly less for more gender-equal countries.

On the other hand, the marginal benefit of hiring a female director can be higher for red-state firms than for blue-state firms if gender and other discriminatory practices have led to suboptimal allocation of labor—for example, if firms hire less qualified male directors over more qualified female candidates. Stated differently, if firms are willing to accept lower profits just to avoid the hiring or promoting of women (Wolfers 2006), discontinuing such practices can lead to higher profits. Related evidence is in a Miller and Segal (2016) study, which predicts that police quality will improve when police departments integrate females into the workforce, thereby removing discriminatory barriers that cause departments to reject women for less capable men.[14] Miller and Segal (2016) do report that law enforcement quality improves when female officers are hired in areas where enforcement quality is lower. For the foregoing reasons, we do not have a directional prediction for Hypothesis 2a.

Finally, notice that we also anticipate and test whether the likelihood of hiring a female director differs between more/less prejudicial regions. Given the prior findings on regional differences in labor market outcomes in terms of gender segregation and wage differences (Janssen et al. 2016; May and McGarvey 2017), we do not advance a formal hypothesis for this test.

Data and Methodology

We obtain a sample of 25,086 firm-years after merging the Compustat financial database with the RiskMetrics database which provides the board of director information collected from publicly available proxy statements. After excluding firm-year observations for firms that are not based in the United States and observations with missing variables (see the specifications below), the final sample consists of unbalanced panel data of 16,864 firm-year observations from 1996 to 2014, representing 2219 unique firms.

Differential Performance Across Regions for Hypothesis 1

Hypothesis 1 asks whether financial performance is different between red and blue states, and between regions where residents hold varying stereotypical attitudes toward gender equality. We note that this hypothesis addresses mostly cross-sectional, rather than time-series, associations, and is not necessarily a causal analysis. This is because certain biases such as political beliefs and discriminatory attitudes are difficult to change over time. We estimate the following equation:

$$Y_{i,j,t} = \alpha_0 + \alpha_1 \text{Location}_{j,t} + \sum_{k=1}^{K} \gamma_k X_{k,i,j,t} + \varepsilon_{i,j,t}, \quad (1)$$

where the dependent variable $Y_{i,j,t}$ is either Tobin's q or ROA indexed by firm i, time t, and state j, and variables denoted by $\sum_{k=1}^{K} \gamma_k X_{k,i,j,t}$ are control variables. Following Servaes and Tamayo (2013) and Surroca et al. (2010), we measure Tobin's q as the sum of the market value of equity plus the book value of debt divided by the total assets. ROA is after-tax net income (revenue less all operating expenses and income taxes) divided by the average total assets.[15]

Of primary interest is the Location variable. The first location measure, Red_State_j, is an indicator variable taking on a value of one (zero) if a firm's headquarter is located in a red (blue) state j. We delineate red versus blue states based on the five presidential elections (1996, 2000, 2004, 2008, and 2012) that overlap the sample period (1996–2014). We designate a state as red (blue) if a Republican (Democratic) candidate won the state in the most recent presidential election. For example, if a Republican candidate carried a state in 2004, the state is coded as 'red' for all data years during 2004–2007. The second measure, $\text{Republican\_Margin}_j$, considers the numerical winning margin of the Republican candidates, and is defined as the percentage of votes cast for the Republican candidate minus the percentage of votes cast for the Democratic candidate in state j for each of the last five elections. Similar to Red_State_j, this measure also varies every four years. Table 1 summarizes the election results during 1996–2014. The results suggest that social and political values have strong persistence over time. For example, the same party consistently carried at least four out of the five presidential elections in 45 states and in the District of Columbia. In the remaining five states (Colorado, Florida, Nevada, Ohio, and Virginia), the same party carried three out of the five elections.

Our second proxy for prejudicial location is from the General Social Survey (GSS), a sociological survey conducted by the University of Chicago's *National Opinion Research Center* (NORC). NORC has been surveying demographic characteristics and attitudes of U.S. residents aged 18 and older since 1972. In certain years, the GSS elicited responses to a number of issues related to individuals' social attitudes. Of particular interest is a question addressing women's role in the workplace, coded *FEFAM (*hereafter Attitudes_Gender). The question was asked to residents of nine geographical areas: New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific. Insomuch as

[14] Miller and Segal (2016) measure law enforcement quality by the rates at which these crimes are reported to police and the rate of escalation of domestic violence.

[15] This is operating earnings per share (EPS) divided by average total assets in Compustat.

Table 1 Presidential election outcomes (1996–2012) and the red-blue division

States		1996	2000	2004	2008	2012	Average %republican/democratic votes	Average republican margin (%)
Alabama	AL	R	R	R	R	R	57.98/39.74	18.24
Alaska	AK	R	R	R	R	R	56.94/35.03	21.91
Arizona	AZ	D	R	R	R	R	51.40/44.99	6.41
Arkansas	AR	D	R	R	R	R	52.34/43.98	8.36
California	CA	D	D	D	D	D	39.64/55.99	− 16.35
Colorado	CO	R	R	R	D	D	47.81/47.79	0.02
Connecticut	CT	D	D	D	D	D	39.21/56.34	− 17.14
Delaware	DE	D	D	D	D	D	40.23/56.13	− 15.90
District of Columbia	DC	D	D	D	D	D	8.29/88.58	− 80.29
Florida	FL	D	R	R	D	D	48.08/48.95	− 0.87
Georgia	GA	R	R	R	R	R	52.99/44.50	8.49
Hawaii	HI	D	D	D	D	D	33.76/61.82	− 28.07
Idaho	ID	R	R	R	R	R	62.61/31.97	30.64
Illinois	IL	D	D	D	D	D	40.26/56.63	− 16.37
Indiana	IN	R	R	R	D	R	53.32/43.11	10.21
Iowa	IA	D	D	R	D	D	45.72/50.79	− 5.07
Kansas	KS	R	R	R	R	R	58.09/37.91	20.19
Kentucky	KY	D	R	R	R	R	55.76/41.17	14.59
Louisiana	LA	D	R	R	R	R	53.11/43.92	9.19
Maine	ME	D	D	D	D	D	40.14/53.65	− 13.52
Maryland	MD	D	D	D	D	D	38.75/58.13	− 19.38
Massachusetts	MA	D	D	D	D	D	34.17/61.14	− 26.96
Michigan	MI	D	D	D	D	D	43.59/53.13	− 9.54
Minnesota	MN	D	D	D	D	D	43.37/51.36	− 7.99
Mississippi	MS	R	R	R	R	R	55.54/42.27	13.28
Missouri	MO	D	R	R	R	R	49.60/46.85	2.75
Montana	MT	R	R	R	R	R	53.28/40.39	12.90
Nebraska	NE	R	R	R	R	R	59.63/36.10	23.53
Nevada	NV	D	R	R	D	D	46.25/49.06	− 2.81
New Hampshire	NH	D	R	D	D	D	45.45/50.50	− 5.05
New Jersey	NJ	D	D	D	D	D	40.90/55.63	− 14.73
New Mexico	NM	D	D	R	D	D	44.83/51.21	− 6.38
New York	NY	D	D	D	D	D	35.42/60.86	− 25.43
North Carolina	NC	R	R	R	D	R	52.11/45.78	6.33
North Dakota	ND	R	R	R	R	R	56.39/38.38	18.01
Ohio	OH	D	R	R	D	D	47.24/48.90	− 1.66
Oklahoma	OK	R	R	R	R	R	61.31/36.18	25.13
Oregon	OR	D	D	D	D	D	43.06/51.29	− 8.23
Pennsylvania	PA	D	D	D	D	D	45.11/51.42	− 6.31
Rhode Island	RI	D	D	D	D	D	33.54/61.14	− 27.60
South Carolina	SC	R	R	R	R	R	54.63/42.93	11.70
South Dakota	SD	R	R	R	R	R	55.55/40.73	14.82
Tennessee	TN	D	R	R	R	R	53.96/43.73	10.24
Texas	TX	R	R	R	R	R	56.34/41.01	15.33
Utah	UT	R	R	R	R	R	65.51/28.91	36.60
Vermont	VT	D	D	D	D	D	34.40/59.39	− 24.99
Virginia	VA	R	R	R	D	D	49.38/47.77	1.60
Washington	WA	D	D	D	D	D	41.76/53.19	− 11.43
West Virginia	WV	D	R	R	R	R	52.52/43.67	8.86
Wisconsin	WI	D	D	D	D	D	44.72/51.08	− 6.36
Wyoming	WY	R	R	R	R	R	63.97/30.79	33.18

Average %republican/democratic votes = the average %votes cast for the republican candidate over the average %votes caser for the democratic candidate during the recent five elections; republican margin = %republican votes − %democratic votes

gender preference applies to director appointment, responses to this question are directly related to the female director membership. During the 1996–2014 period, 35.6% of the adults replied 'yes' to this question. Similar to Republican_Margin$_j$, Attitudes_Gender is defined as the percentage of residents saying 'yes' less the percentage saying 'no.'[16]

There are two advantages to using the Attitudes_Gender measure compared to using the red–blue dichotomy. First, the survey focuses more directly on stereotypical social attitudes toward gender equality, rather than the political preferences represented by the red-blue dichotomy. Second, the average survey response is a continuous variable that provides finer cross-sectional information than an indicator variable (red versus blue). Consequently, the measure provides an additional external validity test on the relationship between gender stereotyping and financial performance. A major disadvantage is that the geographical division is coarser than Red_State or Republican_Margin because the survey regions are divided into nine rather than 50. We note that Attitudes_Gender is surveyed once every 2 years for all years since 1988, and thus, offers a robust survey outcome over time. By contrast, other social attitude surveys such as *FEHOME* (women take care of home not country) or *FEPRES* (vote for woman as president) are available sporadically.[17]

The control variables ($\sum_{k=1}^{K} \gamma_k X_{k,i,j,t}$) are based on Adams and Ferreira (2009), Hull and Rothenberg (2008), and Servaes and Tamayo (2013). More specifically, following Hull and Rothenberg (2008) and Servaes and Tamayo (2013), we include R&D Intensity (R&D expenditure/sales) and Advertising Intensity (advertising expenditure/sales) to control for the impact of innovation on firm value and financial performance.[18] Following Adams and Ferreira (2009), we include firm size (Log Size), firm age (Firm Age, number of years since initial public offering), number of business segments (Segment), board size (Board Size), and fraction of independent directors (Board Independence). Finally, other control variables include year- and industry-fixed effects based on the 48 industry classifications of Fama and French (1997).

Owing to potential endogeneity concerns, we lag all independent variables other than Location by one period and also use the instrumental variables approach to estimate Eq. (1). The instruments include Location$_{t-4}$, Location$_{t-8}$, and lagged values of the remaining independent variables. Location$_{t-4}$ refers to the election (or alternatively, the GSS survey) results of the preceding four-year window. That is, for the data period 2004–2007, Red_State$_{t-4}$ addresses the election results pertaining to 2000–2003, and Red_State$_{t-8}$ addresses that of 1996–1999.

Firm-Fixed Effects Estimation for Hypotheses 2 and 2a

We estimate the following fixed effects to test Hypotheses 2 and 2a concerning financial performance:

$$\begin{aligned}\text{Performance}_{i,j,t} = {} & \theta_i * \text{Firm}_i + \beta_1 * \text{Female\_Dir}_{i,j,t} \\ & + \beta_2 * \text{Female\_Dir}_{i,j,t} * \text{Location}_{i,j,t} \\ & + \sum_{k=1}^{K} \gamma_k X_{k,i,j,t} + \epsilon_{i,j,i},\end{aligned} \tag{2}$$

where Performance$_{j,t}$ is either Tobin's q or the ROA and the indicator variable Female_Dir$_{i,j,t}$ designates whether a female director is on the board (=1) or not (=0) in company i, located in state j, in fiscal year t.

The estimates for the β_1 and β_2 coefficients address Hypotheses 2 and 2a, respectively. A non-zero β_1 estimate on Female_Dir indicates that corporate financial performance is higher (or lower) when a female director is present on the board (Hypothesis 2). Conditional on rejecting Hypothesis 2, a non-zero β_2 estimate on Female_Dir*Location suggests that the performance benefit due to female director presence is amplified or muted in red state firms (Hypothesis 2a). The control variables ($\sum_{k=1}^{K} \gamma_k X_{k,i,j,t}$) are the same as in Eq. (1), except that they include year-fixed effects and no industry-fixed effects. As is well known, the fixed-effects model has the advantage of mitigating the confounding effects of the omitted variables and endogeneity, and thus, is subject to less bias. This benefit comes with the cost of removing potentially useful cross-sectional variation and reduced statistical power, however.

Results

Regional Difference in Female Director Appointment

Table 2 presents the summary statistics and simple correlations among the key variables that enter the regression specification regarding financial performance. The mean fraction of female directors was 10.74% during 1996–2014. Awareness of the under-representation of females on boards has been increasing, and as a result, there has been an effort

[16] The actual survey question is "*Home is much better if the man is the achiever outside the home and the woman takes care of the home and family. Do you agree?* We use the survey results for the period between 1996 and 2014, to be consistent with our sample period.

[17] *FEHOME* survey was discontinued after 1998, and *FEPRES* was surveyed in four years: 1996, 1998, 2008, and 2010. The average 'yes' response to *FEPRES* is 94.2%.

[18] To mitigate the influence of outliers, all of te continuous variables are winsorized at the 1st and 99th percentiles.

to elevate female board membership.[19] Untabulated results show that the proportion of females on boards almost doubled from 7.99 to 15.14% over the 17-year time span between 1997 and 2014.

In Panel B, the covariates' correlations are generally unremarkable, other than expected characteristics such as a strong positive correlation between long-term market-based performance measure (Tobin's q) and short-term performance measure (ROA). Observe that Attitudes_Gender is significantly positively correlated with both Red_State ($\rho = 0.304$) and with Republican_Margin ($\rho = 0.239$); that is, regions where residents hold more gender-stereotypical views (Attitudes_Gender) tend to be associated with red states. The correlation is far less than perfect, however, implying that Attitudes_Gender and Red_State also reflect different attributes of prejudice and other social norms.

Two characteristics are worth noting between the red-state and blue-state firms (untabulated). First, the mean board size is comparable between the blue-state and red-state companies (9.97 vs. 9.75) and the red-state companies are, on average, slightly larger than the blue-state companies. However, the red-state companies employ fewer female directors: the percentage of female directors in red-state firms is 9.31% compared with 11.46% in blue state firms.[20]

Because univariate tests can be misleading, we use the following multivariate specification to test whether the representation of females on corporate boards is lower in red-state firms than in blue-state firms or in regions where residents hold more stereotypical views on women's role in workplace.

$$\text{Female\_Dir}_{i,j,t} = \beta_0 + \beta_1 * \text{ Location}_{i,j,t} + \text{Controls} + \epsilon_{i,j,i}, \quad (3)$$

The Control variables include: (1) year-fixed effects; (2) industry-fixed effects based on the 48 industry classifications of Fama and French (1997); (3) Female Participation, defined as full-time entry-level female labor force participation (at the state level) to control for the supply of potential female directors;[21] (4) an indicator variable (Family_Friendly_States) designating six states (California, Hawaii, New Jersey, New York, Rhode Island, and Washington) that have passed a law guaranteeing employees some form of paid family leave;[22] (5) Local Director Pool (availability of prospective directors in the firm's vicinity) is the logarithm of one plus the number of U.S. nonfinancial firms headquartered within 60 miles of the firm's headquarters (Knyazeva et al. 2013), and (6) two firm-level control variables: firm size (Log size, the natural logarithm of total assets) and the book-to-market ratio [the book value of equity divided by the market value of equity (stock price multiplied by the number of outstanding shares)].

Table 3 includes six regression specifications for this test. Columns 1 through 3 show the ordinary least squares (OLS) estimates using the fraction of female directors on boards (designated %Female) as the dependent variable, whereas Columns 4 through 6 display the Probit estimates using the binary indicator variable (Female_Dir) as the dependent variable. In addition, Columns 1, 2, 4, and 5 distinguish the red from the blue states by using the Red_State indicator variable and the Republican_Margin, and Columns 3 and 6 use the average GSS survey response about the role of females in the household (Attitudes_Gender). Standard errors are clustered by firm (Petersen 2009).

Regardless of whether the dependent variable is continuous (Columns 1–3) or discrete (Columns 4–6), all specifications consistently indicate that potentially more prejudicial regions (i.e., red states and regions where Attitudes_Gender is high) tend to have significantly fewer female directors. The point estimate for Red_State in Column 1 implies that the fraction of female board members is lower by 2.33% in red states than in blue states (t-statistic = −5.94). The point estimate for Attitudes_Gender of −4.10 (t-statistic = −2.73) in Column 3 suggests that the fraction of female directorship falls by 0.4% for every 10% increase in the polling margin for the response that women should take care of the home and family. We obtain comparable conclusions by using the Probit prediction model (Columns 4–6) or by delineating the Location with Republican_Margin (Columns 2 and 5).

In sum, the results reported in Table 3 demonstrate that female directors are less likely to be appointed in states or regions where residents hold more conservative social attitudes or more sexist beliefs on gender equality. The outcome serves as a useful background for assessing the impact of female directors on financial performance jointly with the location effect.

[19] For example, Apple Inc. announced that it will seek out "highly qualified women and individuals from minority groups," after being criticized by its own shareholders for the lack of diversity (http://business.time.com/2014/01/06/apple-promises-push-to-get-more-minorities-women-on-board/#ixzz2peVsnTpF).

[20] The t-statistic for the difference is 13.35.

[21] This is the state's female full-time labor force divided by the state's full-time male and female labor force lagged by 10 years to mitigate potential endogeneity concerns (see Adams and Kirchmaier 2013).

[22] Following Guthrie and Roth (1999), we also consider the number of statutory provisions that make explicit references to EEO laws, without material difference in the results. We do not incorporate this variable because it is missing for three states.

Table 2 Summary statistics

	Mean	Std. Dev.	Min.	Q1	Median	Q3	Max
Panel A: summary statistics for the full sample [N = 16,864 firm-years]							
No. of board members	9.830	3.753	1.000	8.000	9.000	11.000	42.000
No. of female board members	1.126	1.086	0.000	0.000	1.000	2.000	12.000
% of female board members	10.737	9.922	0.000	0.000	10.000	16.667	100.000
No. of non-executive directors	8.098	3.364	0.000	6.000	8.000	10.000	40.000
% of non-executive female directors/ total non-executive directors	12.299	11.097	0.000	0.000	12.500	20.000	100.000
Female_Dir (= 1 if Female on Board)	0.675	0.468	0.000	0.000	1.000	1.000	1.000
Red_State	0.337	0.473	0.000	0.000	0.000	1.000	1.000
Republican_Margin	−0.056	0.157	−0.859	−0.169	−0.067	0.049	0.479
Attitudes_Gender	−0.305	0.113	−0.558	−0.390	−0.294	−0.236	0.038
Tobin's *q*	1.877	1.200	0.425	1.174	1.502	2.137	19.152
ROA	0.058	0.075	−1.323	0.026	0.054	0.091	0.411
Firm age	3.237	0.626	0.693	2.773	3.332	3.807	4.159
R&D intensity	0.045	0.271	0.000	0.000	0.000	0.031	17.444
Advertising intensity	0.010	0.024	0.000	0.000	0.000	0.007	0.274
Log size	7.780	1.573	2.533	6.640	7.613	8.761	14.593
Segment	1.078	0.595	0.000	0.693	1.099	1.609	2.485
Board size	9.850	3.782	1.000	8.000	9.000	11.000	48.000
Board independence	0.695	0.192	0.000	0.600	0.750	0.833	1.000

	Tobin's *q*	ROA	Red_ State	Repub-lican_ Margin	Atti-tudes_ Gender	Female_ Dir	Firm age	R&D intensity	Adv intensity	Log size	Segment	Board size
Panel B: Pearson correlation												
ROA	0.460											
	< 0.0001											
Red_ State	−0.098	−0.018										
	< 0.0001	0.021										
Repub-lican_ Margin	−0.095	−0.009	0.797									
	< 0.0001	0.267	< 0.0001									
Atti-tudes_ Gender	−0.069	−0.074	0.304	0.239								
	< 0.0001	< 0.0001	< 0.0001	< 0.0001								
Female_ Dir	−0.014	0.063	−0.058	−0.058	−0.071							
	0.075	< 0.0001	< 0.0001	< 0.0001	< 0.0001							
Firm age	−0.154	0.011	−0.025	−0.022	−0.074	0.247						
	< 0.0001	0.139	0.001	0.005	< 0.0001	< 0.0001						
R&D	0.162	−0.346	−0.067	−0.069	−0.012	−0.052	−0.078					
Intensity	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.126	< 0.0001	< 0.0001					
Advertis-ing	0.155	0.081	−0.054	−0.068	−0.016	0.078	−0.008	0.022				
Intensity	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.033	< 0.0001	0.294	0.004				
Log size	−0.125	−0.010	0.008	−0.031	−0.023	0.363	0.325	−0.102	0.008			
	< 0.0001	0.211	0.286	< 0.0001	0.002	< 0.0001	< 0.0001	< 0.0001	0.324			
Segment	−0.083	−0.018	0.019	0.015	−0.019	0.039	0.217	−0.026	−0.110	0.061		
	< 0.0001	0.023	0.015	0.047	0.013	< 0.0001	< 0.0001	0.001	< 0.0001	< 0.0001		

Table 2 (continued)

	Tobin's q	ROA	Red_ State	Republican_ Margin	Attitudes_ Gender	Female_ Dir	Firm age	R&D intensity	Adv intensity	Log size	Segment	Board size
Board size	−0.077	−0.014	0.021	−0.007	0.071	0.323	0.234	−0.053	0.015	0.407	0.035	
	<0.0001	0.076	0.007	0.383	<0.0001	<0.0001	<0.0001	<0.0001	0.052	<0.0001	<0.0001	
Board Independence	−0.051	0.019	−0.044	−0.025	−0.153	0.255	0.190	0.000	−0.015	0.198	0.068	0.141
	<0.0001	0.015	<0.0001	0.001	<0.0001	<0.0001	<0.0001	0.970	0.045	<0.0001	<0.0001	<0.0001

Female_Dir = 1 if a female director serves on the board of directors, zero otherwise, Red_State = 1 if a firm's headquarter is located in a red state and zero otherwise (coded 1 if Republican_Margin > 0). Republican_Margin = percent of votes received by a Republican presidential candidate less percent of votes received by a Democratic candidate in each state. Both Red_State and Republican_Margin vary every 4 years based on the election results. Attitudes_Gender = the percent of respondents answering yes, minus the percent of respondents answering no, to a question "Home is it much better if the man is the achiever outside the home and the woman takes care of the home and family?" (GSS code *FEFAM*); Tobin's q = (market value of equity + book value of debt)/total assets, ROA = return on assets (after-tax net income (revenue less all operating expenses and income tax)/average total assets), firm age = log (number of years since initial public offering), R&D intensity = R&D expenditure/sales, advertising intensity = advertising expenditure/sales, log size = natural logarithm of total assets, segment = log (number of business segments), board size = number of directors, board independence = fraction of independent directors

p values are underneath the correlation coefficients

Regional Variation in Financial Performance

Hypothesis 1 concerns whether financial performance varies across regions where residents hold varying degrees of stereotypical notions about gender equality. Table 4 displays the instrumental variable (IV) estimates of Eq. (1.) The first three columns use Tobin's q as a financial performance measure, whereas the next three columns relate to the accounting performance measure, ROA. Notice that the three columns differ only in the definition of Location, namely, Red_State, Republican_Margin, or Attitudes_Gender.

When financial performance is Tobin's q, the estimates for Location is reliably negative regardless of how Location is defined. For example, the point estimate of −0.174 (t-statistic = −6.02) on Red_State (Column 1) implies that Tobin's q of the red-state firms is, on average, lower than that of the blue-state firms by 17.4% of assets. Stated differently, the red-state firms are not reaching their full market potential compared with the blue-state firms. Notice that because we control for industry-fixed effects, the evidence of underperformance of red-state companies cannot be attributed to industry effects. The point estimate of −0.360 for Republican_Margin (Column 2) indicates that in states where the margin of victory for the Republican presidential candidate is larger by 10%, firm value is smaller by 3.6% of assets (t-statistic=−4.93).[23] In Column 3, the negative estimate of −1.069 for Attitudes_Gender (t-statistic = −6.15) suggests that in regions where the Attitudes_Gender polling margin is larger by 10%, the firm value is lower by 10.7% of assets. It is noteworthy that two proxies of prejudicial social attitude, one based on apparent political preference and the other based on sexist attitude toward women, yield similar outcomes with comparable statistical significance.

Turning to the accounting performance measure (ROA), the estimates are negative for all three Location variables. The significance levels are weaker, however, than those based on Tobin's q. More specifically, the estimates for both Republican_Margin and Attitudes_Gender are within two standard errors from zero, with the exception of the coefficient estimate on Red_State, which is −0.006 (t-statistic = −2.95).

Finally, observe that the χ^2-statistics from the J-test for over-identifying restrictions yield p-values less than 0.15 for all specifications except Column 3 (Attitudes_Gender). This indicates that the orthogonality conditions cannot be rejected at a reasonable significance level for most specifications.[24] In summary, the results in Table 4 support rejecting Hypothesis 1 in favor of a conclusion that prejudice is costly for firm-value maximization.

[23] Because Republican_Margin is expressed as a fraction, a 0.1 increase in Republican_Margin represents a 10% increase, which translates into −0.036 increase in Tobin's q, according to the coefficient estimate of −0.360.

[24] The specification test, therefore, offers some confidence that the regression model is well-specified based on the choice of the instruments.

Table 3 Relationship between fraction of female directors and red and blue states

Dependent variable	%Female			Female_Dir		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	−18.849	−9.931	−25.962	−6.469	−5.162	−7.774
	(6.916)	(7.307)	(6.983)	(0.517)	(0.567)	(0.507)
Red_State	−2.331			−0.353		
	(0.392)			(0.029)		
				[−0.099]		
Republican_Margin		−7.558			−1.185	
		(1.597)			(0.112)	
					[−0.333]	
Attitudes_Gender			−4.100			−0.301
			(1.500)			(0.117)
						[−0.085]
Local director pool	−0.065	−0.155	0.043	−0.059	−0.074	−0.040
	(0.151)	(0.160)	(0.149)	(0.010)	(0.010)	(0.010)
				[−0.017]	[−0.021]	[−0.011]
Female participation	0.439	0.230	0.519	0.088	0.057	0.108
	(0.141)	(0.146)	(0.145)	(0.010)	(0.011)	(0.010)
				[0.025]	[0.016]	[0.030]
Family_friendly_states	0.366	0.081	1.261	−0.067	−0.113	0.081
	(0.552)	(0.567)	(0.543)	(0.034)	(0.037)	(0.032)
				[−0.019]	[−0.032]	[0.023]
Book-to-market	−0.552	−0.558	−0.556	−0.093	−0.092	−0.096
	(0.305)	(0.305)	(0.305)	(0.027)	(0.027)	(0.027)
				[−0.026]	[−0.026]	[−0.027]
Log size	1.584	1.577	1.583	0.391	0.389	0.386
	(0.119)	(0.119)	(0.120)	(0.009)	(0.009)	(0.009)
				[0.110]	[0.109]	[0.109]
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.220	0.218	0.214			
Log likelihood				−8396	−8412	−8466

Standard errors are in parentheses. All specifications include year-fixed effects and industry-fixed effects delineated by Fama and French (1997). The total number of firm-year observations used is 16,855 in all specifications. %Female = the fraction of female directors on boards, local director pool = log of one plus the number of U.S. nonfinancial firms headquartered within 60 miles of the firm's headquarters, excluding firms in the same 4-digit SIC industry, female participation = female full-time labor force divided by the total male and female labor force, lagged by 10 years; family_friendly_states = 1, if the company headquarter is located in California, Hawaii, New Jersey, New York, Rhode Island, or Washington; 0 otherwise. See Table 2 for definitions of other variables

Financial Performance Before and After Female Director Appointment

Table 5 reports the fixed-effects estimates for Hypotheses 2 and 2a using Tobin's q as a measure of financial performance. Recall that Hypotheses 2 and 2a address both the mean effect of having a female director(s) on the boards and the interactive effect of female directors and Location. The first column shows estimates for the mean effect of female director(s), whereas the next three columns include both the mean and the interactive impact of female director presence and Location, delineated by Red_State, Republican_Margin, or Attitudes_Gender.

Turning to the coefficients of interest for Hypothesis 2 (Column 1), the coefficient estimate on the indicator variable Female_Dir is positive (0.057), with an associated t-statistic of 2.54. This estimate suggests that, on average, firm value improves by 5.7% of assets when a female director is on the board, thus rejecting the null Hypothesis 2.

Concerning Hypothesis 2a, the estimate for Female_Dir*Republican_Margin in Column 2 is positive at 0.479 (t-statistic = 4.40). This estimate implies that the

Table 4 Instrumental variable (IV) estimation of the relationship between firm performance and location

Dependent variable	Tobin's q			ROA		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	2.563	2.461	2.084	0.057	0.053	0.047
	(0.149)	(0.146)	(0.154)	(0.009)	(0.009)	(0.009)
Red_State	−0.174			−0.006		
	(0.029)			(0.002)		
Republican_Margin		−0.360			−0.004	
		(0.073)			(0.005)	
Attitudes_Gender			−1.069			−0.015
			(0.174)			(0.011)
Firm age	−0.163	−0.159	−0.147	−0.001	0.000	0.000
	(0.023)	(0.023)	(0.023)	(0.001)	(0.001)	(0.001)
R&D intensity	0.444	0.443	0.442	−0.155	−0.152	−0.150
	(0.120)	(0.119)	(0.118)	(0.023)	(0.023)	(0.022)
Advertising intensity	5.480	5.507	5.816	0.210	0.217	0.220
	(0.797)	(0.796)	(0.798)	(0.064)	(0.062)	(0.061)
Log size	−0.018	−0.017	−0.019	0.000	0.000	0.000
	(0.011)	(0.011)	(0.011)	(0.001)	(0.001)	(0.001)
Segment	−0.081	−0.083	−0.084	−0.004	−0.005	−0.005
	(0.019)	(0.019)	(0.019)	(0.001)	(0.001)	(0.001)
Board size	−0.005	−0.007	−0.004	0.000	0.000	0.000
	(0.005)	(0.005)	(0.005)	(0.000)	(0.000)	(0.000)
Board size	0.024	0.035	−0.036	0.004	0.004	0.003
	(0.086)	(0.085)	(0.084)	(0.005)	(0.005)	(0.005)
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.193	0.193	0.193	0.179	0.183	0.185
Over-identifying restrictions	1.83	0.17	13.94	0.78	0.00	0.27
χ^2-statistic(d.f.=1)	0.18	0.68	0.00	0.38	0.98	0.60
p value						

Standard errors are in parentheses. All specifications include year-fixed effects and industry-fixed effects delineated by Fama and French (1997). All independent variables other than Location (Red_State, Republican_Margin, or Attitudes_Gender) are lagged by one period, and estimates are based on instrumental variables estimation (GMM) procedures. Instruments include lagged values of Location (Location$_{t-4}$, Location$_{t-8}$), and lagged values of the remaining explanatory variables. The total number of firm-year observations used is 16,864 in all specifications. See Table 2 for definitions of variables

improvement in financial performance, measured in Tobin's q, is larger for firms located in red states than in blue states. In particular, the incremental improvement is 4.79% of assets for the states where the Republican presidential candidate's winning margin is larger by 10%. Observe also that the coefficient estimate of 0.085 on Female_Dir indicates a significantly positive mean effect of having a female director on boards (t-statistic = 3.66).

The estimates based on Female_Dir*Red_State (Column 3) yield a similar inference, although with somewhat weaker significance levels: the coefficient estimate on Female_Dir*Red_State is 0.057 (t-statistic = 2.01). Again, this estimate indicates that an improvement in firm value from having a female director is incrementally greater for red-state companies by approximately 5.6% of the total assets. Finally, Column 4 shows that when Location is defined as Attitudes_Gender, both the estimates for Female_Dir and Female_Dir*Attitudes_Gender are positive, but with weaker significance levels. The estimate for Female_Dir is 0.071 (t-statistic = 1.86), whereas that of Female_Dir*Attitudes_Gender is 0.049 (t-statistic = 0.47). The overall results, when considered with the evidence of red-state firms' under-performance discussed above, are consistent with the conjecture that the marginal benefit of hiring a female director is higher for red-state firms than for blue-state firms.

Table 6 reports the estimates from accounting performance measure. In general, the coefficient estimates for Female_Dir and Female_Dir*Location are positive, consistent with the case of Tobin's q. The significance levels are much weaker than those based on Tobin's q, however, as all

Table 5 Impact of location and female directors on firm performance: firm-fixed effects model

Location variable	Location = Republican_Margin		Location= Red_State	Location = Attitudes_Gender
	(1)	(2)	(3)	(4)
Female_Dir	0.057	0.085	0.039	0.071
	(0.022)	(0.023)	(0.024)	(0.038)
Female_ Dir*Location		0.479	0.057	0.049
		(0.109)	(0.028)	(0.104)
Firm age	−0.521	-0.519	−0.521	−0.523
	(0.061)	(0.061)	(0.061)	(0.061)
R&D intensity	0.159	0.156	0.158	0.159
	(0.031)	(0.031)	(0.031)	(0.032)
Advertising intensity	−1.388	−1.418	−1.415	−1.388
	(0.684)	(0.684)	(0.684)	(0.684)
Log size	−0.527	−0.528	−0.528	−0.527
	(0.019)	(0.019)	(0.019)	(0.019)
Segment	−0.043	−0.041	−0.043	−0.043
	(0.018)	(0.017)	(0.018)	(0.018)
Board size	−0.010	−0.010	−0.010	−0.010
	(0.003)	(0.003)	(0.003)	(0.003)
Board independence	0.058	0.054	0.057	0.058
	(0.052)	(0.052)	(0.052)	(0.052)
Firm-fixed effects	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.685	0.685	0.685	0.685

Standard errors are in parentheses. The total number of firm-year observations used is 16,864 in all specifications. See Table 2 for definitions of variables. All independent variables other than Female_Dir and Location are lagged by one period

Dependent variable = Tobin's q

Table 6 Impact of location and female directors on firm performance: firm-fixed effects model

Location variable	Location = Republican_ Margin		Location = Red_ State	Location = Attitudes_Gender
	(1)	(2)	(3)	(4)
Female_Dir	0.0023	0.0028	0.0022	0.0045
	(0.0014)	(0.0015)	(0.0015)	(0.0024)
Female_ Dir*Location		0.0083	0.0005	0.0072
		(0.0068)	(0.0018)	(0.0065)
Firm age	−0.0133	−0.0132	−0.0133	−0.0135
	(0.0038)	(0.0038)	(0.0038)	(0.0038)
R&D intensity	−0.0462	−0.0463	−0.0463	−0.0462
	(0.0020)	(0.0020)	(0.0020)	(0.0020)
Advertising intensity	−0.1029	−0.1034	−0.1031	−0.1030
	(0.0430)	(0.0430)	(0.0430)	(0.0430)
Log size	−0.0164	−0.0164	−0.0164	−0.0164
	(0.0012)	(0.0012)	(0.0012)	(0.0012)
Segment	−0.0010	−0.0010	−0.0010	−0.0010
	(0.0011)	(0.0011)	(0.0011)	(0.0011)
Board size	−0.0002	−0.0002	−0.0002	−0.0003
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Board independence	0.0065	0.0064	0.0065	0.0064
	(0.0032)	(0.0032)	(0.0032)	(0.0032)
Firm-fixed effects	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.685	0.685	0.685	0.685

Standard errors are in parentheses. The total number of firm-year observations used is 16,864 in all specifications. See Table 2 for definitions of variables. All independent variables other than Female_Dir and Location are lagged by one period

Dependent variable = ROA

estimates are within two standard errors away from zero. A potential explanation for this weaker outcome is that ROA reflects financial performance of a single period, whereas Tobin's q represents the present value of all future benefits.

In summary, the results support rejecting the null Hypotheses 1 in favor of a conclusion that corporate performance measured in either Tobin's q or ROA is lower for companies located in red states or in regions where the residents hold more gender-stereotypical views. Results also support rejecting the null Hypotheses 2, in favor of a conclusion that corporate performance measured in Tobin's q is better when a female director is on the board. This effect is less substantial when performance is measured in terms of accounting performance ROA. Finally, regarding Hypothesis 2a, the performance benefit (measured in Tobin's q) of having a female director is larger for companies located in red states than those in blue states. Stated differently, companies located in red states where residents hold more stereotypical notions on gender equality are likely to benefit more from having female directors.

Robustness Tests

We perform three additional tests to ascertain the robustness of the results. First, despite the well-established link between sexism and political conservatism in social science (Federico and Sidanius 2002; Jost et al. 2003), the red versus blue distinction is an amalgamation of political preferences and social attitudes toward gender, race, and other issues. Furthermore, prejudicial attitudes are correlated because a person with a sexist social attitude is also likely to harbor racist opinions (Jost et al. 2003). As a result, it is difficult to isolate the outcome resulting from sexist beliefs from that resulting from other prejudice such as race. In an attempt to control for attitudes on race, we utilize another GSS survey, namely, the percentage of respondents

answering 'yes' to the question: "On the average African-Americans have worse jobs, income, and housing than white people. Do you think these differences are because most African-Americans have less in-born ability to learn?" (GSS code *RACDIF2*). This survey outcome is available for every other year since 1988. During the 1996–2014 period, 9.9% of adults answered 'yes' to this question, which we designate as Attitudes_Race hereafter.

Panel A of Table 7 reports the instrumental variable estimates (Columns 1 and 2) and the fixed-effects estimates (Columns 3 and 4) using Attitudes_Race as an independent variable or jointly in conjunction with Republican_Margin. Panel B reports Pearson correlations between Attitudes_Race, and Attitudes_Gender, and Republican_Margin. Notice in Panel B that there is a strong positive correlation between Attitudes_Race and Attitudes_Gender ($\rho = 0.458$, $p < 0.0001$), implying that racial prejudice is correlated with sexist attitudes. However, Attitudes_Race is uncorrelated with either the Republican_Margin or Red_State. Stated differently, red states are more correlated with sexist attitudes than with stereotypical racial attitudes.

Racial prejudice is also related to substandard financial performance. As indicated in Column 1 of Table 7 Panel A, the negative estimate − 1.899 for Attitudes_Race implies that in regions where the Attitudes_Race polling margin is larger by 1%, the firm value is lower by 1.89% of total assets. When both Republican_Margin and Attitudes_Race are included as explanatory variables, both indicators have negative and significant estimates: the coefficient estimates are − 0.359 (t-statistic= − 4.96) on Republican_Margin and − 1.835 (t-statistic= -5.42) on Attitudes_Race.

The specification in Column 4 considers both Female_Dir*Republican_Margin and Female_Dir*Attitudes_Race in the fixed-effects model to examine whether Republican_Margin serves as a proxy for racist beliefs. The coefficient estimate on Female_Dir*Republican_Margin is significantly positive (t-statistic = 4.50) and that on Female_Dir*Attitudes_Race is marginally significant (t-statistic = 1.63). The evidence of the dominant effect of Republican_Margin offers an assurance that the results for Hypotheses 2 and 2a are not attributable to racial prejudice.

In a second set of tests, we note that most corporate boards in the U.S. are dominated by males who decide whether to hire female directors. Accordingly, results can be more pronounced by using the survey responses of males alone. We find that results for Hypothesis 1 (Eq. 1) are somewhat stronger by using the Attitudes_Gender survey results restricting the results to responses from adult males. For example, the coefficient estimate on Attitudes_Gender is − 0.989 (t-statistic = − 8.05) using the male-only response, compared with − 1.069 (t-statistic = − 6.15) using all responses. Results for the firm-fixed effects estimation (Hypotheses 2 and 2a) using the male-only Attitudes_Gender response are not materially different, however.

Finally, we expect that directors are recruited from the national, rather than local, pool of senior managers, considering the importance of the board of directors and becausea directorship does not require residency close to the corporate headquarters. Even so, firms may attempt to hire directors from among the eligible local senior managers. As a result, the third robustness test addresses the supply of local directors from geographically close director labor markets. Knyazeva et al. (2013) report that, for small firms, the number of independent directors is associated with the proximity to larger pools of local director talent. Following Knyazeva et al. (2013), we measure the local director pool as the number of non-financial U.S. firms located within 60 miles of the firm's headquarters, excluding firms within the same 4-digit SIC industry. We find immaterial difference in estimates for Hypothesis 1, regardless of controlling for the local director pool. The results are also insensitive to alternative definitions of the local director pool, e.g., the number of firms located within 100 miles of the firm's headquarters, the number of firms with total assets of at least $100 million located within 60 miles of the firm's headquarters, and the number of financial and non-financial firms located within 60 miles of the firm's headquarters.

Discussion and Conclusions

Low female board membership is a high-profile issue of interest for various interest groups, policy-makers, fund managers, and the popular press.[25] Based on the studies that link political conservatism and sexism, we predict that female board membership and financial performance differ between red and blue states, and across regions where residents have a more stereotypical notion of women's role in the workplace. We find that both financial performance and female board representation are lower for firms headquartered in red states when compared to those in blue states, and find similar results for firms located in regions where residents hold more gender-stereotypical views.

Most individuals will agree that inequality still exists in the U.S. and around the world. The GSS survey confirms that stereotypical social attitudes toward gender and race

[25] In April 2011, the California Public Employees' Retirement System (CalPERS) and the California State Teachers' Retirement System (CalSTRS) announced that they are developing a new digital resource (Diverse Director DataSource; "3D").

Table 7 Robustness test considering attitudes on race

Dependent variable = Tobin's q	IV Estimation		Firm-fixed Effect	
	(1)	(2)	(3)	(4)
Panel A: Regression estimates considering racism				
Intercept	0.811	0.894		
	(0.334)	(0.332)		
Republican_Margin		−0.359		
		(0.072)		
Attitudes_Race	−1.899	−1.835		
	(0.343)	(0.339)		
Female_Dir			0.267	0.341
			(0.158)	(0.159)
Female_Dir*Republican_Margin				0.490
				(0.109)
Female_Dir*Attitudes_Race			0.260	0.316
			(0.194)	(0.194)
Firm age	−0.143	−0.145	−0.523	−0.521
	(0.023)	(0.023)	(0.061)	(0.061)
R&D intensity	0.427	0.423	0.159	0.157
	(0.119)	(0.120)	(0.032)	(0.031)
Advertising intensity	5.325	5.274	−1.389	−1.420
	(0.796)	(0.789)	(0.684)	(0.684)
Log size	−0.017	−0.019	−0.526	−0.527
	(0.011)	(0.011)	(0.019)	(0.019)
Segment	−0.084	−0.083	−0.043	−0.041
	(0.019)	(0.019)	(0.018)	(0.017)
Board size	−0.003	−0.003	−0.010	−0.010
	(0.005)	(0.005)	(0.003)	(0.003)
Board independence	0.018	0.013	0.057	0.054
	(0.085)	(0.084)	(0.052)	(0.052)
Industry-fixed effects	Yes	Yes	No	No
Firm-fixed effects	No	No	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.195	0.197	0.685	0.685
Over-identifying restrictions				
χ^2-statistic(degree of freedom)	0.01 (d.f. = 1)	0.10 (d.f. = 2)	–	–
p value	0.90	0.95	–	–

	Republican margin	Red_State	Attitudes_Gender
Panel B: Pearson correlation			
Red_State	0.751		
	0.0001		
Attitudes_Gender	0.148	0.238	
	0.0001	0.001	
Attitudes_Race	−0.006	0.038	0.458
	0.862	0.254	0.0001

Standard errors are in parentheses. Estimates in columns (1) and (2) are based on instrumental variables estimation (GMM) procedures. Instruments include lagged values of Republican_Margin (Republican_Margin $_{t-4}$, Republican_Margin $_{t-8}$), and lagged values of the remaining explanatory variables. In column 2, instruments also include lagged values of Attitudes_Race (Attitudes_Race$_{t-4}$, Attitudes_Race$_{t-8}$). Estimates in columns (3) and (4) are based on firm-fixed effects and year-fixed effects models. Attitudes_Race = percent of respondents answering yes, minus percent of respondents answering no, to a question "On the average African-Americans have worse jobs, income, and housing than white people. Do you think these differences are because most African-Americans have less in-born ability to learn?" (*GSS* Survey code *RACDIF2*). See Table 2 for definitions of other variables. All independent variables other than Female_Dir, Republican_Margin, and Attitudes_Race are lagged by one period

p values in *Panel B* are underneath the correlation coefficients. The correlation coefficients are computed for 50 states over 19 years (1996–2014), for a total sample size of 950

equality do exist at the present time. For example, the 2016 GSS Attitudes_Gender survey finds that 31.0% of adults in the U.S. believe that it is better for men to work and women to tend the home, although the 2016 percentage declined from the 1996 level of 37.9%. The same survey also finds that 8.5% of adults believe that African-Americans have inborn learnings disabilities (Attitudes_Race). One of the useful findings in this study is that prejudice is costly for a firm. In particular, we find that the firm value for red-state companies is lower by 17.4% of assets when compared to blue-state companies, and similarly in regions where residents hold more biased social attitudes toward gender or race equality. Thus, discriminatory practices, regardless of being gender- or race-related, are costly for the firm and translate into a lower firm value and operating performance.

A second useful set of findings relates to the membership and the impact of female directors. Aside from the ethical perspective, numerous writers have argued that it makes economic sense to hire more female directors. Nevertheless, academic evidence for making a business case has been mixed. We do find that financial performance improves with the presence of a female director regardless of the regional differences. There is also evidence that the benefit of performance improvement (Tobin's q) is significantly greater for red-state companies when compared to blue-state companies. In sum, this study yields significant evidence in favor of the conclusion that there is, indeed, a business case for hiring female directors.

Results reported in our study are subject to the following caveats and limitations. First, as indicated in the data, political preferences, sexist beliefs, and racial prejudices are highly correlated. Accordingly, the reported results cannot be attributed solely to social attitudes toward gender equality. Nevertheless, the results are persuasive that firms in prejudicial regions underperform and hire fewer female directors. Given the finding that prejudice leads to hiring fewer female directors, it is reasonable to attribute that outcome to gender preference, rather than racial or political preferences. Second, our study does not fully consider the supply-side effects, such as individual taste or distaste for certain corporate cultures. For example, potential female directors could avoid red state companies due to a perception that red company boards are hostile to females. If so, it would be more difficult for red state firms to recruit females. Even so, a directorship is not only prestigious but also lucrative; the average director compensation is $180,000 according to the data used in this study, even though a directorship does not require continuous involvement in the firm. As a result, there is a strong economic and career incentive that may dominate the potential misgivings of female candidates.

This study contributes to the existing literature in the following ways: First, it offers the first systematic evidence that regional variation in sexism affects female director appointment and financial performance predictably and systematically. Second, perhaps more importantly, it contributes to the ongoing debate about whether the presence of female directors improves corporate performance. Previous studies on the link between gender diversity and corporate performance have reported uneven and often contradictory evidence (Adams and Ferreira 2009; Simpson et al. 2010). However, our analysis based on the instrumental variable and firm-fixed effects approaches yields evidence in favor of the conclusion that the presence of female directors improves corporate performance.

This study also informs potential approaches toward improving low female board membership. Former Securities and Exchange Commission (SEC) Chair, Mary Jo White, pointed out that to address the lack of female board representation, the "challenge is not a lack of suitable candidates; there is adequate supply, but the challenge is creating real and committed demand."[26] If the objective is to encourage greater female representation in boardrooms, then policymakers are encouraged to work more toward bringing down the gender-stereotypical public perceptions.

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Conflict of interest The authors declare that each of them has no conflict of interest.

Ethical Approval The authors did not conduct any studies with human participants or animals.

[26] Completing the Journey: Women as Directors of Public Companies (Mary Jo White, SEC Chair, September 16, 2014): http://www.sec.gov/News/Speech/Detail/Speech/1370542961053#.VDWGoSldUWk.

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