Women in charge: Evidence from hospitals

Katharina Lewellen
Tuck School at Dartmouth
k.lewellen@dartmouth.edu

September 2020

Abstract

The female share of chief executives in public firms has been persistently low, and as a result empirical studies of firms with female CEOs are rare. This paper examines a large sample of U.S. non-profit hospitals in which women make up 19% of CEOs. Contrary to prior literature, it finds no evidence that gender differences in preferences for risk, competition, or altruism affect firm-CEO match, or affect corporate decisions of female CEOs. Female and male CEOs responded similarly to the financial shock of 2008, including by cutting employment and salary growth. Women in CEO positions earn 22% lower salaries than men, largely explained by the smaller size of the hospitals they manage, suggesting that labor markets value female leadership skills at a significant discount relative to those of men. The gender pay gap shrinks to a significant 8% after differences between hospitals and CEOs are accounted for.

1 Introduction

Women make up 47% of the U.S. labor force, yet the top executive jobs are held predominantly by men. For example in 2018, only 4.8% of Fortune 500 CEOs were women. This low share is puzzling, especially since women are increasingly well-educated and hold a growing fraction of lower-level management jobs. This paper sheds light at this persistent gap by examining a single industry – the U.S. hospital sector – in which female CEOs are relatively common. The paper focuses on three questions: when are hospitals more likely to appoint female CEOs, and once in office, do female CEOs make different decisions than men? Lastly, is there evidence on gender discrimination in how hospitals compensate their CEOs?

The literature suggests several possible reasons for the low share of women among chief executives, including gender differences, stereotypes, career interruptions, and institutional barriers, such as lack of networks and mentoring.[1] A number of experimental studies point to gender differences in preferences or skill as a potentially significant factor. They show that women exhibit greater risk aversion and lower overconfidence than men (see review in Croson and Gneezy (2009)). Women also tend to shy away from competition, and in surveys place stronger emphasis on values of benevolence and security vs. power and achievement (Schwartz and Rubel (2005)). These "female traits" may not be desirable in top-rank executives: higher risk aversion may cause managers to forgo profitable but risky projects while benevolence may lead to stakeholder-friendly policies, for example, raising labor costs above competitive levels. Understanding these questions is important: if women manage firms differently than men, a push towards more women in executive ranks would have a lasting effect on corporate decision making.

Empirical studies of firms led by women have been rare, in spite of the strong interest in the topic among academics, politicians, and the general public. One reason is that, given the small number of female CEOs in public firms, it is difficult to obtain large enough samples to conduct empirical analysis.[2] In this paper, I focus on the healthcare sector, which helps overcome this challenge. Based on data from hospitals' IRS filings, close to 19% of U.S. hospital CEOs in 2014 were women, up from

[1] See for example: Athey, Avery, and Zemsky (2000), Andreoni and Vesterlund (2001), Niederle and Vesterlund (2007), Sapienza, Zingales, and Maestripieri (2009).

[2] Several studies focus instead on the gender composition of corporate boards (Adams and Ferreira (2009), Ahern and Dittmar (2012), Matsa and Miller (2013), Eckbo, Nygaard and Thorburn (2014)). Faccio, Marchica and Mura (2016) study CEO gender in predominantly private European firms. Overall, the findings in these studies are consistent with women having a distinct "management style" characterized by more conservative financing strategies, low investment rates, and more concern for the interest of employees. The findings are summarized in more detail in Section 2.

10% in 1999. As a result, I can study a large sample of female CEOs within a single industry over 15 years. The healthcare sector has several other advantages. Data on hospital finances, operations, and governance is, in many respects, more comprehensive and detailed than what is available for public firms. In contrast to shareholder-owned firms, nonprofits engage in both charitable and profit-generating activities, which allows me to test whether preferences for benevolence and equality, documented for women more broadly, are reflected in their decisions as CEOs. Finally, hospitals are scattered across the U.S., and their business activity is highly localized. This offers a unique opportunity to study geographic determinants of female career outcomes.

I begin by documenting broad associations between hospital attributes and the incidence female CEOs. While this analysis does not identify causal effects, it is a useful starting point: if gender differences in preferences and skill are important in the selection of top executives, they should be reflected in the observed hospital-CEO match. For example, if female executives are generally more risk averse, they should match with hospitals that take on less risk and, once in office, should make safer financing and investment choices.

The next set of tests focuses on whether female CEOs make different decisions than men. Answering this question is difficult given the endogenous matching between hospitals and CEOs. The identification strategy relies on the major shock to U.S. hospitals as a result of the 2008 financial crisis and the subsequent economic downturn. I test whether women responded differently to the crisis than men, and if so, whether the effects line up with prior evidence on gender differences. For example, if preference for altruism induces women to be more protective of their employees, we should see evidence that female CEOs shield employees more, especially during bad times. Similarly, women may exhibit stronger willingness to help low-income or uninsured patients, causing larger increases in the share of Medicaid patients or greater efforts to secure donations to finance these efforts.

The first part of the analysis reveals that gender differences in preferences for risk, benevolence, or competition have no effect on CEO-hospital match. The analysis considers a range of hospital financial characteristics that should indicate less aggressive financial, investment, or competitive policies, including leverage, cash holdings, and investment rates. I find no evidence that female CEOs are more likely to match with hospitals with these characteristics, or that financing or investment strategies change when women take office. Similarly, I find little evidence that women lead more charitable hospitals or increase charity while in office. The lack of significance is not due to lack of

power: The test reject with high degree of confidence that CEO gender has economically meaningful effects on hospital attributes.

The two hospital attributes with most explanatory power are hospital size (discussed below) and its geographic location. The pervasive finding is that female CEOs are substantially more common in densely populated urban areas. As an example, the fraction of female CEOs is 24% for hospitals located in one of the ten largest U.S. cities compared to 14% across other locations. Population density correlates with a range of economic and demographic variables that could affect both the local supply of qualified female candidates and the boards' willingness to hire them. While multiple factors are likely at play, the evidence in this paper suggests that donor (or other stakeholder) preferences might affect the boards' propensity to appoint female CEOs.

The second part of the analysis exploits the major economic shock to hospitals caused by the financial crisis of 2008 and the subsequent economic downturn. Hospitals were hit hard by the crisis through multiple channels. The market crash caused a sudden drop in the value of hospital endowments, affecting their short-term cash flows and the overall financial health. The subsequent credit crunch restricted hospitals' access to credit and increased borrowing costs, while rising unemployment meant that many Americans lost their employment-based health insurance. Hospitals responded to these events by cutting investment and reducing employment and salary growth. The paper asks whether these responses differed across hospitals with male and female CEOs, and whether the differences line up with the gender-specific preferences and values. Because the shock was unexpected, there is little concern that anticipation affected the hospitals' choice of the CEO. The detailed hospital-level data allows me to match closely hospitals with male and female CEOs, and both samples follow similar paths leading up to the crisis.

The conclusions from this analysis are largely consistent with the evidence described above. Both groups of hospitals experienced similar declines in profitability and revenue growth after the crisis, and responded by cutting investment, employment, and salary growth. There is no evidence, however, that these responses differed between hospitals managed by women vs. men. In fact, the pre- and post-crisis patterns in the outcome variables are remarkably similar across the two groups. This evidence matches the results in the full sample that show no shifts in hospital decision making when male vs. female CEOs take office.

Having established the key evidence on the female CEOs' "management style", the paper turns to the question of how these CEOs are being compensated. A large literature in labor economics

shows that women earn lower salaries than men across a broad range of occupations and industries (see review in Blau and Kahn (2017)). This "unexplained" wage gap has been often cited as evidence of gender discrimination. The challenge with this perspective is that the gap could be also affected by other factors, including unmeasured productivity differences between men and women or selection of women into certain (usually lower-paid) jobs. These concerns are mitigated in the current setting that examines a single industry and a narrowly defined occupation. The focus on CEOs is of interest in its own right – to date, only a few studies examine gender pay gap within this group because the number of female CEOs in public firms is small.[3] Healthcare offers an interesting setting: given the high share of women in hospital management, one would expect the effects of discrimination to be more muted than in other sectors, suggesting a lower gender gap.

The analysis of CEO pay reveals that this is not the case: the wage regressions estimate a significant unconditional gender pay gap of 21.9%, which is similar to the estimates for broader populations. Even after controlling for a range of hospital and CEO characteristics, a significant gap of 8.2% remains, and this magnitude is again comparable to that found in other settings. Interestingly, the estimate is unchanged between the first and the second halves of the 15-year sample period – a time during which female share in CEO jobs almost doubled (from 10% to 19%). Perhaps more importantly, two-thirds of the unconditional gap can be accounted for by hospital size: female CEOs are much more common in smaller hospitals that generally pay their CEOs less.[4] The traditional CEO labor markets theories suggest that, in competitive markets, the more talented (and thus, the more highly-paid) CEOs should manage larger firms, in which they are more productive. Within this framework, these findings imply a substantial gap in the market's assessment of the male and female managerial talent.

Overall, the results in this paper paint a consistent picture: female CEOs make similar decisions as men, and they do not match with hospitals more aligned with the "traditionally female" preferences and values. These findings suggest that self-selection and professional expertise may reduce, or even eliminate, gender differences at the top of corporate hierarchies (see also, Johnson and Powell (1994),

[3] Bugeja, Matolcsy, and Spiropoulos (2012) examine a large cross-section of U.S. public firms and find no significant gender gap in CEO pay. Several studies, most notably Bertrand and Hallock (2001) and Gayle, Golan, and Miller (2012), focus instead on a wider set of top-ranking executives and find mixed results. Studies of gender pay gap in other high-paying occupations, such as lawyers and MBAs, include Noonan, Corcoran, and Courant (2005), Bertrnad, Goldin, and Katz (2010) and Golding (2017). Goldin and Rouse (2000), Boyd, Epstein, and Martin (2010), Egan, Matvos, and Seru (2019) investigate other forms of gender discrimination in professional settings.

[4] This size discount mirrors the findings in Bertrand and Hallock for a S&P1500 female executives in the mid-1990s.

Dwyer, Gilkeson, and List (2002)), Adams and Funk (2012)). This is at odds with the findings in the existing studies of decision making by female executives and directors (summarized in Section 2) that suggest the existence of a distinct female management style (Matsa and Miller (2013), Faccio, Marchica, and Mura (2016), Huang and Kisgen (2012)). While female CEOs' decisions are similar to those of men, their salaries are not. This is in large part because women match with hospitals that pay their CEOs less. More research is needed to understand this dynamics, both within healthcare and firms more broadly.

2 Literature overview

Psychology and economics literatures document significant gender differences in several areas that may have a bearing on corporate decision making, including preference for risk, overconfidence, attitudes towards competition, and benevolence (extensive review of the economics literature is in Croson and Gneezy (2009), and of the psychology literature in Eagly (1995)). One pervasive finding in both fields is that women tend to be more risk averse than men. This finding is consistent across a range of experimental studies involving real or hypothetical gambles as well as studies of real-life choices such as asset allocation or savings (see overviews in Byrnes, Miller, and Schafer (1999) and Eckel and Grossman (2008)). A second persistent pattern found in experimental settings is that women are less overconfident than men though both men and women exhibit overconfidence (e.g., Soll and Klayman (2004)). Third, women appear to shy away from competition and perform relatively worse compared to men in competitive settings (Gneezy, Niederle, and Rustichini (2003), Niederle and Vestrlund (2007), Hogarth, Krelaia and Trujillo (2012)).[5] In addition, some studies document gender differences in attitudes towards altruism and inequality though results in this area are more mixed. While women usually exhibit more altruism and inequality aversion in experimental studies (e.g. in the ultimatum or dictatorship games), results are sensitive to the specifics of the experiment, such as the anonymity or gender of the subject's counterparty in the game (see overview in Crosson and Gneezy (2009)).[6] Finally, Schwartz and Rubel (2005) report that men and women prioritize different values in survey settings, and that these differences persist across samples and cultures. For

[5] Interestingly, Gneezy, Leonard, and List (2009) find that the female tendency to self-select out of competitive situations disappears in a matrilineal society (Khasi society in India).

[6] Della Vigna, Malmendier, and Rao (2013) find no gender difference in generosity in a door-to-door solicitation, but they find that women are less likely to give when it is easier to avoid the solicitor.

example, women report to assign higher importance to benevolence and security while men are more likely to favor power, stimulation, and achievement.

Notably, a few studies report that gender differences in risk taking diminish in professional situations, or when financial knowledge is controlled for (Johnson and Powell (1994), Dwyer, Gilkeson, and List (2002)), suggesting that self-selection plays a role in these settings. Consistently, Adams and Funk (2012) find, based on a survey of directors in Sweden, that female directors show weaker preference for security than male directors. They find however that, in line with previous studies, female directors emphasize benevolence more strongly than male directors and the reverse is true for power and accomplishment.

A handful of corporate finance papers examine corporate choices of firms with male vs. female executives or directors. Given that female CEOs are rare in public U.S. firms, Faccio, Marchica, and Mura (2016) examine a large sample of European private and public firms. They find that firms led by female CEOs are less risky and choose safer financing strategies, consistent with women's higher risk aversion. In addition, female CEOs appear to be reluctant to take advantage of valuable but risky investment opportunities, potentially leading to capital misallocation. In a similar spirit, Huang and Kisgen (2013) examine investment decisions of male and female executives of public U.S. firms with titles of CEO or CFO. Comparing male-to-female and female-to-male transitions, they find that male executives undertake more acquisitions and issue more debt that female executives, and that acquisitions made by male executives have lower announcement returns. In addition, they find that female executives place wider bounds on their earnings forecasts and are more likely to exercise in-the-money options. Based on these findings, Huang and Kisgen conclude that male executives' higher overconfidence causes their more aggressive corporate decisions.

Additional insights about the effects of gender on firm leadership comes from studies of boards of directors. A notable contribution by Matsa and Miller (2013) examines the effects of the introduction of gender quota for corporate board seats in Norway in 2006.[7] They find that companies affected by the quota increased female representation on their boards by an average of 20 percentage points. Subsequently, these firms made fewer layoffs and increased their labor costs compared to a control sample. The authors suggest that "labor hoarding" might be a systematic feature of a female

[7] The quota required that all publicly listed companies increase female board representation to 40%. Studies of stock market reaction to the announcement of the quota report mixed results depending on the date used (Ahern and Dittmar (2012), Eckbo, Nygaard, Thorburn (2016)).

management style, consistent with survey evidence on women's greater emphasis on benevolence vs. achievement and efficiency. Matsa and Miller (2011) show that greater female representation on corporate boards predicts a higher fraction of women among top executives (but not vice versa), suggesting that female directors are more likely to hire female executives. These results are broadly consistent with the importance of female networks and mentoring in the promotion decisions.

3 Data and sample

The main dataset of nonprofit hospitals comes from the IRS Form 990 filings required annually from most organizations exempt from federal taxes.[8] The filings contain detailed information on each organization's finances, mission, programs, and governance. The dataset was provided to us by Guidestar USA Inc., an information service on U.S. nonprofits. The Guidestar dataset covers all Hospitals and Primary Medical Care Facilities as classified by the National Center for Charitable Statistics from 1999 through 2014. It contains financial statement items and names, titles, and salaries of the hospitals' trustees, officers, and highest paid employees. I combine the Form 990 data with detailed information on the hospitals' services, operations, and system affiliation from the American Hospital Association (AHA) Annual Survey Database that was provided to us by The Dartmouth Institute for Health Policy and Clinical Practice for years 2000-2006 and 2008-2012. I extrapolate the persistent hospital attributes in the missing years. Information on Hospital Service Area associated with each hospital comes from the Dartmouth Atlas of Health Care. The areas' demographic characteristics are constructed using the zip code level data from the U.S. Census.

I start with a panel of 28,149 hospital-years and 1,924 hospitals that are included in both the Guidestar and the AHA databases. This means that for an entity to be included in the sample, it must file Form 990 with the IRS and also submit a survey to the AHA. The full panel spans years 1999 through 2014. Using the Form 990 officer and director names and titles, I am able to identify the hospital CEO – or in the absence of a CEO, of the president – for 1,903 hospitals and 25,333 hospital years. In some cases, information on the hospital CEO or president is missing or ambiguous. For example, several officers might be listed as CEOs in a hospital's Form 990, with some of the titles referring to affiliated organizations rather than the hospital itself. I attempt to resolve these cases

[8] Churches and state institutions are tax exempt organizations that are not required to file Form 990.

manually case-by-case.[9] After requiring that the CEO is in office for at least one year, I am left with 1,858 hospitals and 22,924 hospital-years. Descriptive statistics for the full sample are in Table 1.

4 When are hospitals more likely to have female CEOs?

The hospital sector offers a unique setting to study firms led by female CEOs. In contrast to public firms, women are relatively common among hospital CEOs, and rich data on hospital financials, operations, and governance is available from multiple sources. In this section, I explore the link between CEO gender and hospital attributes and behavior. While the analysis does not allow to draw causal inferences, it is a useful starting point. For example, if female CEOs have a lower preference for risk, they should match with less risky organizations and, while in office, make safer financing and investment choices. In a similar vein, a stronger preference for altruism should generate a positive link between female CEOs and the hospital's engagement in charity and transfers to the poor.

4.1 Risk and competition

To start with, I examine measures of hospital financial risk and capital investments, used traditionally in corporate finance literature to study managers' attitudes towards risk and overconfidence. Table 2 shows regressions of an indicator for a female CEO on measures of financial leverage, cash holdings, holdings of securities, and capital investments. I estimate OLS regressions to accommodate the large number of hospital fixed effects and maintain this specification throughout for consistency. The table shows regressions with and without hospital fixed effects; the former controls for hospital size, profitability, and the hospital location in a more urban vs. rural area. (I explore these controls in more detail in Sections 4.3 and 6) The results are consistent across all regressions. I find no evidence that hospitals led by female CEOs have lower investment rates or more conservative capital structures. There is also no evidence that within-hospital gender switches cause significant shifts in these policies. In all regressions, coefficients on *Leverage*, *Cash/Assets, Securities /*

[9] Given this ambiguity and the lack of standardized titles in Form 990, I develop a multi-stage procedure to identify the CEO or president. First, I compile a list of titles that indicate the CEO of the hospital (rather than a CEO of an affiliated organization), such as "CEO, president, and director", "CEO and board member", "Chief execute officer", etc. I then check cases with multiple officers having such titles in a single hospital-year. Most of these cases are CEO transitions. In transition years, I eliminate the outgoing CEO. Second, in the remaining sample, I identify all hospital-years with a single officer whose title contains the string "CEO" or "Chief exec" and assume that this officer is the CEO of the hospital. Third, I examine hospital years that contain no officers with titles containing the string "CEO" or "Chief exec". In this sample, I repeat the procedure similar to the previous three steps to identify the hospital's president. Fourth, I do a series of manual checks to verify and fill in missing CEO information.

Assets, and *Investments* are statistically insignificant, and their signs are often inconsistent with the predictions in Section 2.

It is worthwhile to note that, on average, hospitals make significant investments and rely heavily on debt: in the sample, the average growth in fixed assets is 7% and the average debt-to-assets ratio is 26%. Both variables exhibit significant cross-sectional variation (the standard deviations are 22% and 19%), yet this variation is unrelated to the gender of the hospital's CEO. Based on column 2, an increase in leverage by one standard deviation leads to a small and statistically insignificant *increase* in the likelihood that the CEO is female by 0.36 percentage points. I can reject with 95% confidence that this effect is a decline of more than 1.2 percentage points (coefficients on cash and securities yield similar magnitudes). Based on column 4, a one-standard deviation increase in capital investments decreases the likelihood that the CEO is female by an insignificant 0.02 percentage points, and I can reject with 95% confidence a decline larger than 0.4 percentage points.

The studies surveyed in Section 2 report consistently that women tend to avoid competition more than men, and that they perform relatively worse in competitive settings. Given these preferences, female CEOs may select out of the more competitive business environments. I measure competition as the number of general medical and surgical hospitals in the Hospital Service Area (HSA). The HSA classification, developed by the Dartmouth Atlas of Health Care, assigns each hospital to a local market (a collection of zip codes), so that the residents within each area receive most of their hospitalizations from hospitals located in that area. The median number of hospitals in an HSA in the sample is one, so most hospitals face little competition. However, the number can be as high as 10 (the 95th percentile) and is 2.74 on average. I measure the degree of competition within an HSA using a *Competition Rank* that is set to one for HSAs with a single hospital, and set to 2, 3, or 4 when this number is between 2 and 4, 5 and 9, or more than 9.

The last two columns in Table 2 include *Competition Rank* as an explanatory variable. Interestingly, female CEOs are significantly *more* common in areas with more competitive hospital markets. Based on column 7, increasing *Competition Rank* by one increases the likelihood that a hospital CEO is female by 3.6 percentage points (p-value less than 0.01). As I show below, competition is generally more intense in urban densely populated areas, which differ from the rural markets along many dimensions, including demographics, economic growth, and culture. These differences, rather than competition itself, could account for the significant effect on gender in column 7 (consistently, including population density controls in column 8 reduces the effect of competition by more than two-thirds).

I explore this possibility further in Section 4.3. Nevertheless, the results in this table suggest that competition avoidance is not a first-order factor driving the CEO-hospital match.

4.2 Charity

As discussed earlier, in survey settings, women assign higher weights to values of benevolence, altruism, and equality than men. These preferences could influence both their decisions as CEOs, and the types of organizations they lead. Nonprofit hospitals offer a unique setting to test these hypotheses as they engage in both profit generating and charitable activities. While charity is specific to nonprofits, preferences for benevolence and altruism could carry over to other aspects of corporate decision making and thus be relevant for firms more broadly. For example, Matsa and Miller (2013) argue that more benevolent managers might favor interest of stakeholders over the principle of value maximization (see also evidence in Adams, Licht, and Sagiv (2011)).

I define charity broadly as provision of goods or services to consumers at prices below their marginal costs. In case of nonprofit hospitals, charity is financed from multiple sources, including income from endowments, private donations, government contributions, or cross-subsidization from privately-insured (and thus usually more profitable) patients. While no direct measures of the hospitals' overall charitable activity are publically available, I can infer its importance from financial data and demographic characteristics of the patient population. The demographic indicators I use include measures of median income and unemployment rate in the hospital's HSA (averaged across the HSA's zip codes). On the financing side, I include measures of government and private donations as a fraction of hospital revenues. In addition, I use the fraction of Medicaid and Medicare inpatient days to the total inpatient days. Medicaid (and to a lesser degree Medicare) patients are, on average, unprofitable to hospitals.[10] Importantly, numerous studies show that hospitals have a discretion to limit services to less profitable patients, and appear to do so in specific clinical settings.[11]

The results are in Table 3. The overall message from these regressions is that that female CEOs do not favor hospitals that engage in more charity or transfers to the poor. First, women do not appear to match with hospitals in lower-income or high-unemployment areas. The coefficients on *Pct.*

[10] American Hospital Association estimates that both Medicaid and Medicare paid hospitals 87 cents for every dollar spent for caring for Medicaid or Medicare patients in 2017 ("Underpayment by Medicare and Medicaid Fact Sheet", American Hospital Association, January 2019)). Historically, however, Medicaid reimbursement rates were below those of Medicare (Dranove and White (1998), Fract (2011)).

[11] As an example, Venkatesh et al. (2019) find that emergency departments are more likely to discharge or transfer uninsured or Medicaid patients compared to privately insured patients with similar medical conditions. See also Nacht, Macht,and Ginde (2013) and Kidnermann et al. (2014).

Unemployment and *Log(Median Income)* are insignificant and close to zero in all regressions. Similarly, including hospital fixed effects in column 4 shows no evidence that female CEOs tilt services towards Medicaid or Medicare patients while in office. The lack of significance does not appear to be a result of low power. For example, based on column 1, increasing *Pct. Unemployed* by one standard deviation *reduces* the likelihood that the CEO is female by an insignificant 0.29 percentage points, and I can reject with 95% confidence that this likelihood increases by more than 1.15 percentage points. The effect of a one-standard deviation increase in Medicaid Days based on column 4 is an insignificant 0.06 percentage point decline, and I can reject with 95% confidence that the effect is an increase of more than 1.35 percentage points.

Based on the regressions in the last two columns of Table 3, there is weak evidence that female CEOs raise more funds through private and government donations, however, the magnitudes of these effects are small and are not statistically significant at the conventional levels. I explore these effects in more detail in Section 3.2.

One reason for the lack of a clear link between charity and female leadership might be that women who self-select into the top executive jobs have preferences closer to those of men. Alternatively, it is possible that the extent to which a hospital engages in charity is correlated with more challenging or risky environments, which may be less attractive for women (however, I find no direct evidence of negative effects of financial risk or tougher competition). In either case, preference for altruism does not appear to be a major determinant of the hospital-CEO match.

4.3 Urban location

Turning to the control variables in Tables 2 and 3, the two strongest determinants of CEO gender are hospital size (discussed in more detail in Section 6) and its geographic location. The location results are striking: both tables show consistently large and significant coefficients on measures of population density. They indicate that the frequency of female CEOs is close to 11% higher in the top 10 US cities (based on population) than in other areas. Similarly, the frequency increases significantly with the population density of the hospital's HSA.[12]

[12] A hospital's economic activity is highly localized. Most patients attend physician practices located nearby, and because physicians are usually affiliated with local hospitals, they tend to refer patients to hospitals located close to the patients' place of residence. Using information on hospitalizations of Medicare patients, Dartmouth Atlas developed a methodology that assigns U.S. zip codes into clusters called Hospital Service Areas (HSA), so that patients living within a cluster receive most of their hospitalizations from hospitals located there. See discussion in "The Dartmouth Atlas of Health Care" (1996).

The high fraction of female CEOs in urban areas could be due to a larger supply of qualified women (vs. men), or a stronger demand for female CEOs. Table A1 in the Appendix shows that the more densely populated HSAs are wealthier, younger, better educated and more likely to vote democratic, and that hospitals in those areas are larger and operate in more competitive environments.[13] Distinguishing between the supply- and demand-side explanations is challenging and beyond the scope of this paper, but some insight can be gained from examining the geographic patterns more closely. Table 4 and Figure 2 compare the effect of urban location on the gender of hospital CEOs vs. other hospital executives and trustees. It shows that while female CEOs are much more common in the densely populated areas (Panel A), this is not the case for other executives or trustees (Panels B and C). This is puzzling as one would expect that CEOs and other high-ranking executives are subject to similar labor market forces.

Another noteworthy observation is in column 4 of Table 4. In this regression, the sample is limited to hospitals in the metropolitan areas of the top-ten U.S. cities.[14] Interestingly, even within these metropolitan areas, the fraction of female CEOs is 15% higher for hospitals located in the cities vs. the suburban neighborhoods (p-value is less than 0.01). This is not the case for non-CEO executives (the coefficient of 0.1% and is not significant). This result is again difficult to reconcile with purely supply-side explanations, unless commuting represents a significant barrier for female CEOs (but not for other female executives).

One possibility is that the greater visibility of CEOs makes their selection more susceptible to pressures from local stakeholders, such as donors or politicians. Consistent with this conjecture, Table 5 shows that hospitals with female CEOs receive significantly higher private donations in urban (but not in rural) areas. The dependent variable in these regressions are private and government contributions as a fraction of service revenues, and the regressions control for hospital and year fixed effects. Based on Panel A, a female dummy in high-density areas is associated with an increase in private contributions by 0.9% (p-value is less than 0.05). This is a large effect given that private donations comprise 1% of service revenues on average (Table 1). The effect is close to zero in the

[13] In the sample, the correlation between the density decile ranks of an HSA and the fraction of the democrat vote in the 2000 presidential election is 0.63; the correlation between the density decile ranks and educational attainment is 0.58 (the variables are defined in Appendix A).

[14] A metropolitan area, as defined by the U.S. Census, includes, besides the city itself, also the adjacent territory "that has a high degree of social and economic integration with the core as measured by commuting ties." See the definition on the U.S. Census Bureau website: https://www.census.gov/topics/housing/housing-patterns/about/core-based-statistical-areas.html. The metropolitan areas associated with the top 10 cities in the sample are larger than those cities' HSAs: on average, they include 15 HSAs based on the 2010 count.

low-density areas (Panel B), and the difference between the two samples is significant at the 5% level (Panel C). The regressions show no significant effects of gender on government contributions, or on the hospitals' financial performance (columns 3 and 4). However based on column 5, hospitals with female CEOs hold larger cash balances, and consistent with the findings on private donations, this effect is limited to the high-density areas.

Taken together, this evidence suggests that women may have a comparative advantage in fundraising in the more densely populated and generally more liberal locations. This raises the possibility that preferences of the local donors, and perhaps other hospital stakeholders, contribute to the higher fraction of female CEOs in these areas.

To summarize, the broad associations between CEO gender and hospital type do not align with gender differences in preferences and skill uncovered by the psychology and economics literatures, such as risk aversion, benevolence, or competition avoidance. Instead, hospital size and urban location emerge as the two strongest determinants of CEO gender. This suggests that gender differences are less significant (or even reverse) in the narrower populations of successful business executives.

5 Did female CEOs respond differently to the financial crisis than male CEOs?

5.1 Background

The analysis thus far failed to detect significant differences in female vs. male "management style." Women do not match with hospitals that reflect the "female" preferences and values, and do not appear to change hospital policies after taking office. One could argue, however, that such effects would be difficult to observe during "normal times" when corporate decisions are more routine or require less input from the CEO. This section focuses instead on a major financial shock to hospitals that occurred in the aftermath of the 2008 financial crisis. As explained in more detail below, after the crisis, hospitals experienced significant financial shortfalls and responded by cutting investment and salary growth. The paper asks whether, when faced with these tradeoffs, similar hospitals made different choices depending on the gender of their CEOs.

The financial crisis affected hospitals through multiple channels (see Dranove (2013) and Adelino and Lewellen (2020)). First, nonprofit hospitals hold large endowments, and the value of these assets dropped significantly as a result of the stock market crash of 2008. This decline had a direct effect on hospital cash flows: many hospitals rely on income from investments, and nonprofit spending rules

often automatically tie funds available for spending to the market values of their endowments (see Adelino, Lewellen and Sundaram (2015)). Second, nonprofit hospitals do not have access to equity financing and rely heavily on debt. The credit crunch following the financial crisis constrained the hospitals' access to credit and increased borrowing costs.[15] Third, the ensuing economic downturn brought an increase in unemployment and a decline in the proportion of Americans with employment based health insurance. This likely lowered the demand for healthcare services, and thus, hospital revenues and profits.[16] These effects are illustrated in Figure 3 that tracks hospital performance and investment around the crisis years. The figure shows a discrete drop in profitability (income before contributions scaled by lagged fixed assets) from 7.3% in 2007 to -1.4% in 2008 followed by a drop in capital investments from 6.8% in 2008 to 3.9% in 2009.

5.2 Crisis response and CEO gender

To start with, I identify a sample of hospitals that had a female CEO at the time of the financial crisis. I require that the CEO is in office at the end of 2007 and remains in office at least through 2009. This initial sample consists of 173 hospitals. The control sample is selected from 997 hospitals with a male CEO in 2007, also requiring that he remains in office at least through 2009. To form the treatment and control groups, I use the k-nearest neighbor matching procedure with k=3, matching on hospital attributes in 2007. As a baseline, I match on service revenues, population density rank of the hospital's HSA, net income, leverage, investment, salaries scaled by service revenues, and whether the hospital belongs to a system. The final treatment and control samples consist of 167 and 371 hospitals. Table 6 shows that they are closely matched with respect to a wide range of characteristics.

The regressions in Table 7 compare the behavior of the two groups around the financial crisis (see also Figure 4). The regressions are estimated on a panel of treatment and control firms from 2006 through 2011, with the post-crisis indicator set to one for years 2009 through 2011. In Panel A, each

[15] A survey by the American Hospital Association (AHA) reports that following the crisis a significant fraction of the surveyed hospitals experienced some difficulties with financing, including increased interest expense for variable-rate bonds, increased collateral requirements, inability to issue bonds, difficulty refinancing auction rate debt or roll-over or renew credit. In addition many hospitals with defined-benefit pension plans reported having to increase pension funding levels because of losses on financial investments. American Hospital Association (November 2008). "Rapid Response Survey, The Economic Crisis: Impact on Hospitals."

[16] Unemployment increased from 5% in 2007 9.9% in 2009. According to the U.S. Census Bureau, the proportion of Americans with employment based health insurance declined to 56.1% in 2009 from 59.8% in 2007 while the proportion of Medicaid recipients increased from 13.4% in 2007 and 15.7% in 2009. The American Recovery and Reinvestment Act (ARRA), enacted in February of 2009, provided financial relief of $103 billion to the state Medicaid programs to mitigate the effects of the recession on Medicaid.

column shows a regression of an outcome variable on the interaction of *Post_Crisis* with an indicator for treatment firms. All regressions include hospital and year fixed effects. To illustrate the magnitudes of the main effects, the bottom two panels show the regressions estimated separately on the treatment and control samples. These regressions include the *Post_Crisis* indicator and hospital fixed effects.

As is evident from the bottom panels (columns 1 and 2), both the treatment and the control firms experience sharp declines in profitability and revenue growth immediately after the financial crisis, and the magnitudes of these declines are similar across the samples. Both groups compensated for the financial shortfalls by scaling down capital investments, employment, and salary growth.

Columns 3-8 in Panel A test whether hospital responses differed for male and female CEOs. The tests are motivated by the evidence on gender differences, summarized in Section 2, which suggests that women place a greater emphasis on values of benevolence and altruism than men. If these values influence CEO decisions, they should be reflected in how hospitals treat their more vulnerable stakeholders during economically hard times (see discussion in Matsa and Miller, 2013). Employees and low-income patients are the two natural groups to consider. In columns 3-5, I test whether hospitals with female CEOs reduced employment and salaries less (or increases the share of Medicaid patients more) during the industry downturn relative to hospitals with male CEOs. Since stakeholder-friendly policies must be funded from other sources, the regressions in columns 6-8 test whether treatment hospitals reduce capital expenditures or increase fundraising after the crisis compared to control hospitals.

I find no support for the altruism hypothesis. Looking at the bottom panels, I find that both the treatment and the control sample significantly scale down growth in personnel and salaries after the crisis. Growth in personnel declines *more strongly* for hospitals led by female CEOs (the declines are -2.2 and -1.9 percentage points), and the difference is not statistically significant. There is also no evidence that female CEOs take on a higher share of Medicaid patients relative to men.

The last three columns show changes in capital investments and private and government contributions. Based on column 6, both samples show large reductions in investments, but the responses are again similar across the two groups (this is also illustrated in Figure 4). Finally, based on columns 7 and 8, both samples experience significant declines in private contributions after the crisis, offset by an increase in government contributions of similar magnitude. The differences between the two samples are again statistically insignificant.

In sum, the evidence on hospital responses to the 2008 financial crisis is consistent with the broader patters on hospital-CEO match documented in Section 4. I find little evidence that women responded differently to the financial and economic shock of 2008 than men. Both groups cut investment, employment, and salary growth by similar magnitudes. These results, combined with the evidence in Section 4 suggest that CEO gender has no significant effect on corporate decisions making.

6 Do hospitals compensate male and female CEOs differently?

The analysis thus far shows no evidence that women match with hospitals more aligned with the "female" preferences or values, or that they change hospital policies while in office. This section tests whether female CEOs are paid differently than their male counterparts. Extensive literature in labor economics shows that, on average, women earn lower salaries than men. Much of this gap can be accounted for by gender differences in occupations and industries, and to a lesser extent human-capital factors such as education and experience (see reviews in Blau and Kahn (2017)). However, a significant unexplained gap remains even after adjusting for these differences, and it is generally larger at the higher end of the income distribution.[17]

The unexplained (or residual) wage gap is often interpreted as the effect of gender discrimination. One concern with this interpretation is that this quantity can also reflect unmeasured productivity differences between men and women. On the flip side, discrimination could cause women to select into lower-paid occupations, and if so, regressions that control for occupation would underestimate the effect of discrimination on wages. Both concerns are mitigated in this paper. The tests below compare men and women within a single sector (hospitals) and in the same management position (that of a CEO). Moreover, the rich hospital-level dataset allows the inclusion of detailed controls and hospital fixed effects.

Table 8 describes the sample used for the gender gap analysis. The sample is smaller than that in Table 1 for two reasons. First, salary data is available for only 58% of the hospital-year observations. Based on Table A2 in the Internet Appendix, hospitals with available CEO salary data are similar to the full sample with respect to their size, profitability, and other characteristics, so there is no obvious

[17] For example, Blau and Kahn (2017) estimate that the log ratio of female to male wages was 79% in 2014, up from 60% in the 1980 (log ratio is defined as exp(X) with X being the average log wage of women minus average log wage of men). This estimate drops to 92% after controlling for the observed differences between male and female workers, including occupation and industry.

indication of a selection bias. Second, hospital CEOs sometimes receive part of their salaries from related organizations, and the IRS Form 990 does not require that this portion of pay is reported until 2008. This omission is likely more relevant for CEOs that hold management positions in multiple organizations. For this reason, the baseline sample in Table 8 (8,498 hospital-years) is limited to standalone hospitals and excludes CEOs of multiple hospitals in a given year. Based on Table A2, these hospitals are somewhat smaller but are otherwise similar to those in Table 1. For completeness, I also report results for the full sample (i.e. including system hospitals and CEOs of multiple hospitals) for years 2008-2014 for which pay from related organizations is available. The results are generally consistent across the two samples.

Table 8 shows descriptive statistics for male and female salaries, tenure, and basic hospital attributes. Not surprisingly, women earn lower salaries than men. The average salary for a female CEO in a standalone hospital in Panel A is $368.5 thousand compared to $413.1 thousand for a male CEO (the salaries are in 2014 dollars). The gap is larger for the recent sample that includes salaries from related organizations in Panel B ($465.0 vs. $629.1 thousand). Consistent with the earlier findings, women manage smaller hospitals and hospitals in more urban areas, and as I show below, these characteristics are strongly linked to executive pay. Interestingly, there is no significant gender difference in average tenure (e.g., it is 5.2 years for both genders in Panel A).

Table 9 reports results from the standard wage regressions with log salary as the dependent variable. The regression in the first column, which includes only the female dummy and year fixed effects, estimates an unconditional wage gap of 21.9%. This gap drops to (insignificant) 5.0% in the second column that controls for hospital size, and to 8.2% (significant at the 1% level) in the third column that also includes additional hospital and CEO controls. The results are similar for the full sample during 2008-2014 (Table A3 in the Internet Appendix). Including other hospital controls from Table 1 has no significant effect on this estimate.

The magnitude of the wage gap in Table 9 is comparable to that found in a broad cross-section of industries and occupations (see, for example, Blau and Kahn (2017)). It is also similar to the estimates in Bertrand and Hallock (2001) for high-level managerial occupations in a cross-section of industries from 1992 to 1997.[18] The fact that the wage gap remains significant within the highly homogenous

[18] They find a wage gap of 22% after controlling for the manager's title and a gap of 11% after controlling for firm size, industry, and performance. The coefficient drops further to 5% after controlling for CEO age and tenure though this is estimate is based on a smaller sample and is imprecise. In their data, less than 3% of all top-5 executives are female and

group of hospital CEOs is interesting and points to gender discrimination as a potential cause. However, two facts speak against this interpretation. First, based on column 4 in Table 9, the gap shrinks further to (imprecisely estimated) 4.3% after the inclusion of hospital fixed effects. Second, the gap is remarkably stable across time. Panel B of Table 9 shows the wage regressions estimated separately for the first and the second parts of the sample period. It shows that the unconditional and the residual gaps are similar across the two sub-samples. It is worth noting that during the same time period, the share of women in hospital CEO jobs nearly doubled from 10% in 1999 to 19% in 2014. If this shift was caused, at least in part, by a decline in discrimination, one would expect to see some effect on the residual gap.

A clue might be gained from the fact that a substantial portion of the wage gap in Table 9 is explained by hospital size. A regression with all hospital controls other than size yields a wage gap of 24%, and including size lowers this estimate by 67% (to 8.2%). The mechanism behind this "size effect" is straightforward. As is the case in other industries, CEOs of larger hospitals earn substantially higher salaries (based on column 2, a one percent increase in hospital size increases CEO pay by 0.48%), and because female CEOs are much less common in larger hospitals, their pay reflects the size discount. The matching of female managers with small firms is not limited to hospitals: Bertrand and Hallock (2001) observe a similar pattern in a broader set of ExecuComp executives during the mid-1990s. Within the traditional theories of the CEO labor markets, firm size is tightly linked to CEO ability and therefore also CEO pay (see Lucas (1978) Rosen (1982), an Sattinger (1979) and more recently Gabaix and Landier (2008) and Terviö (2008)).[19] Taking this framework at face value, the results in this paper suggest that the labor markets price management skills of women at a significant discount relative to those of men. The results also suggest that a more thorough exploration of this "gender matching" phenomenon, both within and outside of the healthcare sector, is a worthwhile direction for future research.

7 Conclusions

Prior literature in psychology and economics finds persistent differences between men and women in their preferences for risk, overconfidence, and attitudes towards competition. Women also report

the fraction is smaller for CEOs. Other studies, including Gayle et al. (2012) and Bugeja et al. (2012) find no evidence of a significant gender gap in executive pay in broad cross-sections of public firms.

[19] See empirical evidence on the relation between firms size and CEO pay for broader cross-sections, for example, in Baker, Jensen and Murphy (1988), Rosen (1992), and Frydman and Saks (2010).

to value benevolence and equality more than men (vs. power and achievement). Recent corporate finance studies suggest that these gender differences carry over to the highest levels of corporate hierarchy, and importantly, that they translate into distinct male and female management styles. Female style is characterized by safer financing strategies, low investment and acquisition rates, and more attention to the interest of employees. This paper investigates these ideas using a large sample of female CEOs of U.S. nonprofit hospitals. It starts by examining the attributes of hospitals that match with female CEOs to test whether the quality of the CEO-hospital match is consistent with the hypothesized style. It then examines hospitals' responses to the major financial and economic shock associated with the 2008 financial crisis and the related economic downturn.

Overall, I find little evidence that the "female traits" observed in the general population are reflected in the types of hospitals women match with, or in their decisions as CEOs. There is no evidence that hospitals managed by women follow systematically different financing, investment or employment policies than similar hospitals managed by men. There is also no evidence that women match with hospitals that engage in more charitable activities, or that they increase charity when in office. The results on hospitals' response to the financial crisis yield consistent results. Hospitals were hit hard by the crisis and responded by abruptly cutting investment and reducing employment and salary growth. I find that these responses were remarkably similar for hospitals led by male and female CEOs.

Geographic location emerges as one of the strongest predictors of whether a hospital has a female CEOs. Female CEOs (but not other executives or trustees) are substantially more common in densely populated urban areas, and in these areas appear to be more successful at fundraising than men. While these differences could be caused by a variety of local supply and demand factors, the evidence points to donor preferences as a potentially significant force.

Finally, the paper explores the effects of gender on CEO pay. Extensive literature documents a significant gender gap in pay across occupations and industries, but research involving high-ranking executives has been rare. The healthcare sector offers a useful setting because hospital CEOs are a homogenous group, and because women are relatively common among them. The paper documents a significant unconditional gender pay gap of 22%, which is comparable to that found in broader populations. After controlling for hospital and CEO attributes, a residual gap of 8% remains, and it is stable over the 15-year sample period during which female hospital CEOs became much more common. Two-thirds of the unconditional gender gap can be explained by hospital size: women are

much more likely to manage smaller hospitals in which executive pay is generally low. More research is needed to understand why women select into firms that pay their managers less, both in healthcare and firms more broadly.

8 References

Adelino M., K. Lewellen, and W.B. McCartney, 2019. Hospital financial health and clinical choices: evidence from the financial crisis. Working paper, Dartmouth College and Duke University

Adelino M., K. Lewellen, and A. Sundaram, 2015. "Investment Decisions of Nonprofit Firms: Evidence from Hospitals." *Journal of Finance* 70, 1583-1628

Adams, R., Ferreira, D., 2009. Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics* 94, 291–309.

Adams, R.B., Funk, P.C., 2012. Beyond the glass ceiling: does gender matter? *Management Science* 58, 219-235.

Ahern, K.R., Dittmar, A., 2012. The changing of the boards: The impact on firm valuation of mandated female board representation. *Quarterly Journal of Economics* 127, 137–197.

Andreoni, James, and Lise Vesterlund. 2001. Which Is the Fair Sex? Gender Differences in Altruism. *Quarterly Journal of Economics* 116, 293–312.

Athey, Susan, Christopher Avery, and Peter Zemsky, 2000. "Mentoring and Diversity." American Economic Review 90, 765-786

Baker, G.P., Jensen, M.C. and Murphy, K.J., 1988. Compensation and Incentives: Practice vs. Theory. *Journal of Finance* 43, 593-616

Barber, B., Odean, T., 2001. Boys will be boys: gender, overconfidence, and common stock investment. *Quarterly Journal of Economics* 116, 261–292.

Bertrand, M., Hallock, K., 2001. The gender gap in top corporate jobs. *Industrial and Labor Relations Review* 55, 3–21.

Bertrand, M., Schoar, A., 2003. Managing with style: the effect of managers on firm policies. *Quarterly Journal of Economics* 118, 1169–1208.

Bertrand, M., C. Goldin, and L. F. Katz. 2010. "Dynamics of the Gender Gap for Young Professionals in the Financial and Corporate Sectors." *American Economic Journal: Applied Economics* 2, 228-55.

Bertrand, M., and Kevin F. Hallock. 2001. "The Gender Gap in Top Corporate Jobs." *Industrial and Labor Relations Review* 55, 3-21.

Blau Francine D. and Lawrence M. Kahn, 2017. The gender wage gap: extent, trends, and explanations. *Journal of Economic Literature* 55, 789-865.

Boyd, C. L., L. Epstein, and A. D. Martin. 2010. "Untangling the Causal Effects of Sex on Judging." *American Journal of Political Science* 54, 389-411.

Byrnes, J. P., D. C. Miller, and W. D. Schaffer. 1999. "Gender Differences in Risk Aversion: A Meta-Analysis." *Psychological Bulletin* 125, 367-83.

Bugeja M., Matolcsy Z.P., Spiropoulos H. 2012. Is there a gender gap in CEO compensation? *Journal of Corporate Finance* 18, 849-859

Croson, R., U. Gneezy. 2009. Gender differences in preferences. *Journal of Economics Literature* 47, 1-27.

Delavigna, S., J.A. List, Ulrike Malmedire, and G. Rao, 2013. The Importance of Being Marginal: Gender Differences in Generosity, *American Economic Review Papers and Proceedings*, May 2013.

Dranove, David, Craig Garthwaite, and Christopher Ody, 2016. "How Do Hospitals Respond to Negative

Financial Shocks? The Impact of the 2008 Stock Market Crash." *RAND Journal of Economics* 48, 485-525.

Dranove, D. and White, W. D. (1998), Emerging issues in the antitrust definition of healthcare markets. Health Economics 7: 167-170

Dwyer, Peggy D., James H. Gilkeson, and John A. List. 2002. "Gender Differences in Revealed Risk Taking: Evidence from Mutual Fund Investors." *Economics Letters*, 76(2): 151–58.

Eckbo, Nygaard, Thorburn, 2016. How costly is forced gender-balancing of corporate boards? Working paper, Dartmouth College, Oslo Business School, and Norwegian School of Economics.

Egan Mark, Gregor Matvos, and Amit Seru. 2019. The Market for Financial Adviser Misconduct. *Journal of Political Economy* 127, 233-295.

Eagly, Alice H. 1995. "The Science and Politics of Comparing Women and Men." *American Psychologist* 50, 145–58.

Eckel, C. C., P. J. Grossmann. 2008. Men, women, and risk aversion: Experimental evidence. C. R. Plott, V. L. Smith, eds. Handbook of Experimental Results. Elsevier, Amsterdam, 1061–1073.

Faccio, M., M. T. Marchica, and R. Mura, 2016. CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance* 39, 193-209.

Fract, Austine B., 2011. How Much do Hospitals Cost Shift? A Review of the Evidence. *The Milbank Quarterly* 89, 90–130

Frydman Carola and Raven E. Saks, 2010. Executive Compensation: A New View from a Long-Term Perspective, 1936–2005, *The Review of Financial Studies* 23, 2099–2138.

Gabaix, Xavier and Augustin Landier, Why has CEO Pay Increased So Much?, 2008. *The Quarterly Journal of Economics* 123, 49–100

Gayle G., Golan L., Miller R.A, 2012. Gender differences in executive compensation and job mobility. *Journal of Labor Economics* 30 829-872.

Gneezy, Leonard, and List, 2009. Gender Differences in Competition: Evidence From a Matrilineal and a Patriarchal Society. *Ecomometrica* 77, 1637-1664

Gneezy, U., M. Niederle, A. Rustichini. 2003. Performance in competitive environments: Gender differences. *Quarterly Journal of Economics* 118, 1049-1074.

Goldin, Claudia and Cecilia Rouse, 2000. Orchestrating impartiality: the impact of "blind" auditions on female musicians. *American Economic Review* 90, 715-741.

Goldin, Claudia, 2014. A grand gender convergence: its last chapter." *American Economic Review* 104, 1091–119.

Hogarth, R. M., N. Karelaia, C. A. Trujillo. 2012. When should I quit? Gender differences in exiting competitions. *J. Econom. Behav. Organ*. Forthcoming.

Huang, Jiekun and Darren Kisgen, 2012. Gender and Corporate Finance: Are Male Executives Overconfident Relative to Female Executives? *Journal of Financial Economics* 108, 822-839

Johnson, J. E. V., and P. L. Powell. 1994. "Decision Making, Risk and Gender: Are Managers Diffferent?" *British Journal of Management*, 5(2): 123–38

Kindermann D.R., Mutter R.L., Cartwright-Smith L., Rosenbaum S., Pines J.M.., 2014. Admit or transfer? the role of insurance in high-transfer-rate medical conditions in the emergency department. *Annals of Emergency Medicine* 63, 561-571

Koenig, A. M., A. H. Eagly, A. A. Mitchell, and T. Ristikari. 2011. "Are Leader Stereotypes Masculine? A Meta-Analysis of Three Research Paradigms." Psychological Bulletin 137, 616-42.

Lucas, Robert, 1978. On the Size Distribution of Business Firms, *Bell Journal of Economics* 9, 508-523

Matsa, D. A., and A. R. Miller. 2011. Chipping Away at the Glass Ceiling: Gender Spillovers in corporate leadership. *American Economic Review: Papers and Proceedings*, 101, 635-639.

Matsa, D. A., and A. R. Miller. 2013. A female style in corporate leadership? Evidence from quotas. *American Economic Review: Applied Economics*, 5, 136-169.

Egan, M., G. Matvos, and A. Seru, 2017. When Harry Fired Sally: The Double Standard in Punishing Misconduct. Working paper.

Nacht, Jacob, Marlow Macht and Adit A. Ginde, 2013. Interhospital transfers from U.S. emergency departments: implications for resource utilization, patient safety, and regionalization. *Academic emergency medicine : official journal of the Society for Academic Emergency Medicine* 20, 888-893.

Niederle, M., Versterlund, L., 2007. Do women shy away from competition? Do men compete too much?. *Quarterly Journal of Economics* 122, 1067–1101.

Noonan, Mary C., Mary E. Corcoran, and Paul N. Courant, 2005. Pay differences among the highly trained: cohort differences in the sex gap in lawyer's earnings. *Social Forces* 84, 853–72.

Rosen, Sherwin, 1982. Authority, Control, and the Distribution of Earnings, *The Bell Journal of Economics* 13, 311-323

Sattinger, Michael, 1979. Differential Rents and the Distribution of Earnings. *Oxford Economic Papers* 31, 60-71

Sapienza, P., Zingales, L., Maestripieri, D., 2009. Gender differences in financial risk aversion and career choices are affected by testosterone. In: Proceedings of the National Academy of Sciences.

Schwartz, S. H., T. Rubel. 2005. Sex differences in value priorities: Cross-cultural and multimethod studies. *J. Personality Soc. Psych*. 89, 1010-1028.

Soll, Jack B., and Joshua Klayman. 2004. "Overconfidence in Interval Estimates." J*ournal of Experimental Psychology: Learning, Memory, and Cognition*, 30, 299–314.

Terviö, Marko. 2008. The Difference That CEOs Make: An Assignment Model Approach. *American Economic Review*, 98, 642-68

Venkatesh Arjun K., Shih-Chuan Chou, Shu-Xia Li, and Jennie Choi, 2019. Association Between Insurance Status and Access to Hospital Care in Emergency Department Disposition. *JAMA Internal Medicine* 179, 686-693.

Joseph S. Ross, MD, MHS; Gail D'Onofrio, MD; Harlan M. Krumholz, MD, SM; Kumar Dharmarajan, MD, MBA

Appendix A: Variables definition.

Financial and operational variables	
Service Revenues	Total program service revenues
Assets	Total assets
Net Income	(Total revenues – Total expenses) / Lagged fixed assets
Fixed Assets/Revenues	Land, buildings, equipment less accumulated depreciation / Total revenues
Investment	Growth in fixed assets
Salaries	Salaries and wages excluding executive compensation / Service revenues
Contributions Gov.	Contributions from government grants / Service revenues
Contributions Priv.	(Total contributions – contributions from government grants) / Service revenues
Leverage	(Tax-exempt bond liabilities, mortgages, and other loans) / Total assets
Cash/Assets	Cash, non-interest bearing / Total assets
Securities/Assets	Investments in securities / Total assets
System Dummy	Dummy equal one if the hospital is part of a system
Competition Rank	Rank variable computed based on the number of general medical and surgical hospitals in the Hospital Service Area (HSA). The rank is set to 1, 2, 3, or 4 when the number of hospitals is 1, 2-4, 5-9, or more than 9.
Personnel / Admissions	Total fulltime personnel / Total admissions
Growth in Personnel	Growth rate in total fulltime personnel
Doctors / Personnel (%)	Percent of fulltime physicians and dentists on total fulltime personnel. Details are in Section 10 (Staffing) of the 2013 AHA Annual Survey.
Medicaid Days	Medicaid inpatient days / Total inpatient days
Medicare Days	Medicare inpatient days / Total inpatient days
Equipment	Sum of dummy variables indicating whether a hospital or its subsidiary owns (or provides) a particular diagnostic equipment (or service). This includes electron beam computed tomography, full-flied digital mammography, magnetic resonance imaging, positron emission tomography, ultrasound and other. The full list in under item 83 of the 2013 AHA Annual Survey (Section C, Facilities and Services).
Number of Services	Sum of dummy variables indicating whether a hospital or its subsidiaries owns or provides the following types of hospital beds: general, pediatric, obstetrics, intensive care, cardiac intensive care. Details are in Section C (Facilities and Services) of the 2013 AHA Annual Survey.
Demographic Variables	
Population HSA	Total population of the hospital's HSA based on the 2010 U.S. Census. Regressions use decile ranks.
Density HSA	Population density (population per square mile) of the hospital's HSA based on the 2010 U.S. Census. Regressions use decile ranks.
Top City	Dummy variable equal to one for hospitals located in the top 10 U.S. cities based total population as of the 2010 U.S. Census.

Poverty Family	Percent of families whose income in the past 12 months is below the poverty level based on the 2010 U.S. Census. Zip-code level estimates are averaged across all zip codes in the hospital's HSA, weighted by total population in the zip code.
Median Income	Median family income from the 2010 U.S. Census. Zip-code level estimates are averaged across all zip codes in the hospital's HSA, weighted by total population in the zip code.
Pct. Unemployed	Percent unemployed based on the 2010 U.S. Census. Zip-code level estimates are averaged across all zip-codes in the hospital's HSA, weighted by total population in the zip code.
Educational Attainment	Estimate of population with master, bachelor, doctorate, associate, or professional degrees scaled by total population with completed 12th grade or higher. Only population 25 years or older is included. Estimates are from the 2010 U.S. Census. The ratio is computed on the zip-code level, then averaged across all zip codes in the hospital's HSA, weighted by total population in the zip code.
Democrat	Percent of the residents of the hospital's county that voted for Al Gore in the 2000 presidential election. Data comes from the MIT Election Data and Science Lab, Massachusetts Institute of Technology.

Figure 1: Fraction of female CEOs and trustees in U.S. hospitals. The figure shows the fraction of female CEOs and female non-CEO trustees by year for 22,924 hospital-years (1,858 hospitals) from 1999-2014.

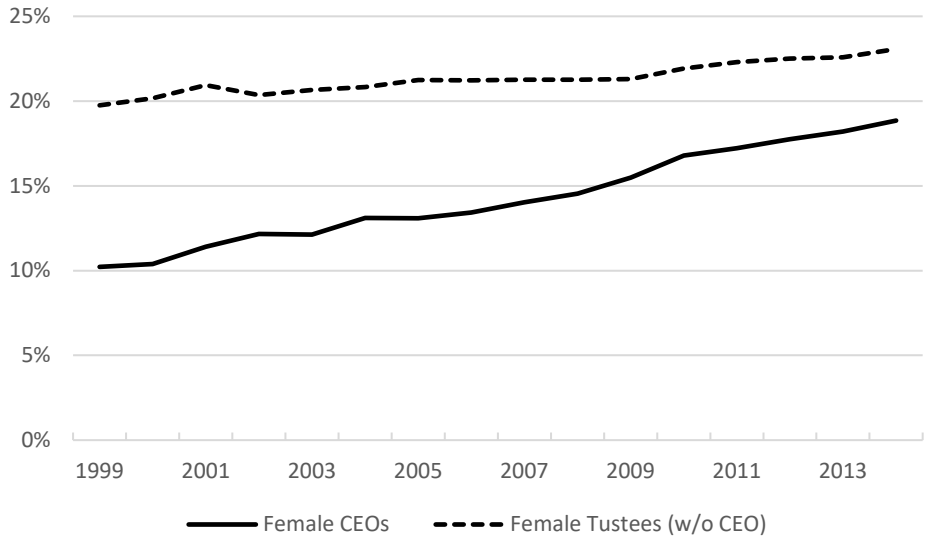
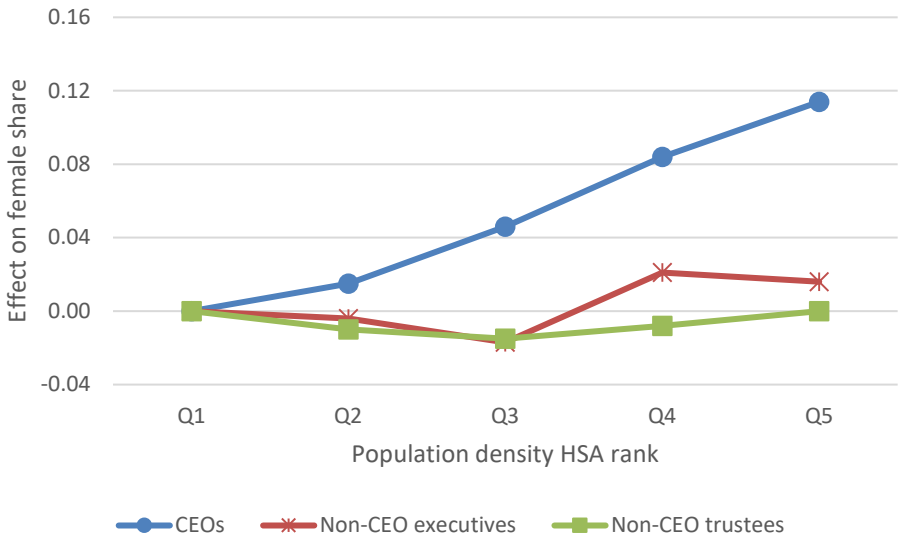


Figure 2: The effects of hospital location on female participation in high-ranking hospital jobs. The figure shows coefficients on dummy variables for the hospital location from regressions analogous to those in Table 4 except that the demographic variable is replaced with the hospital location dummies. In Panel A, the location dummies are indicators for population density quintiles of the hospital's HSA. Population density (population per square mile) is based on the 2010 U.S. Census. In Panel B, the location dummies are indicators for hospitals located in cities ranked 1-10, 11-20, 21-50, and "all other" based on total population of the city in which the hospital is located as of the 2010 U.S. Census.

Panel A: The effect of population density rank on high-ranking female jobs



Panel B: The effect of city population rank on high-ranking female jobs

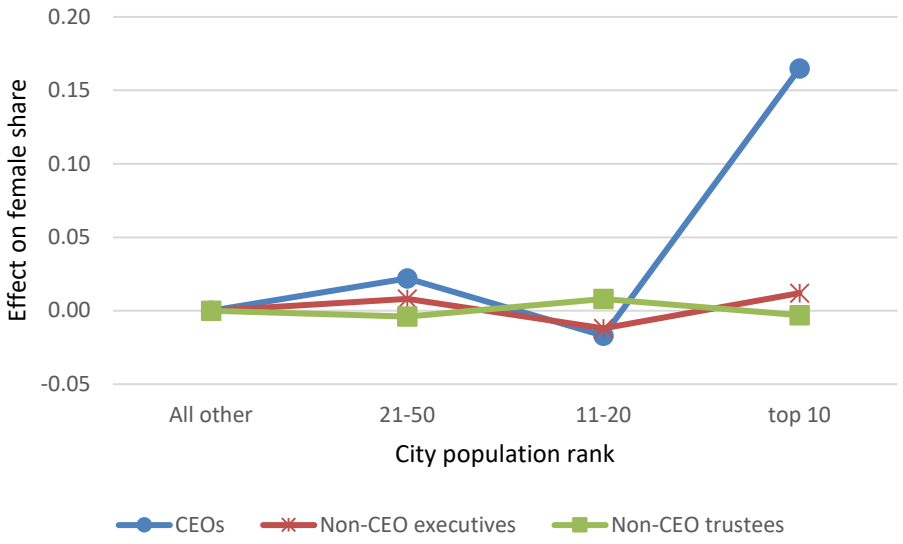


Figure 3: Hospital performance, investment, and salary growth around the 2008 financial crisis. The figures show averages by year of hospital financials for the six years around the financial crisis for the full hospital panel. Variables definitions are in Appendix A.

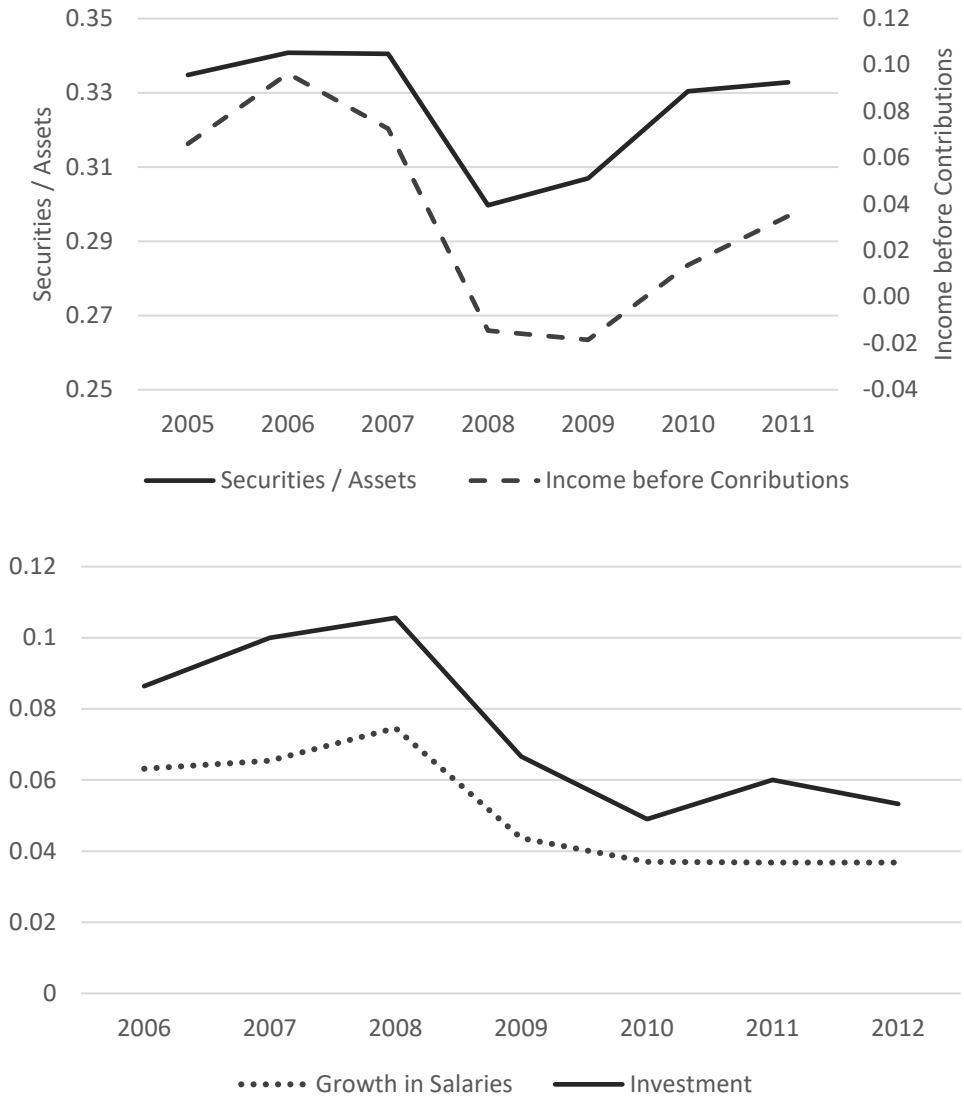
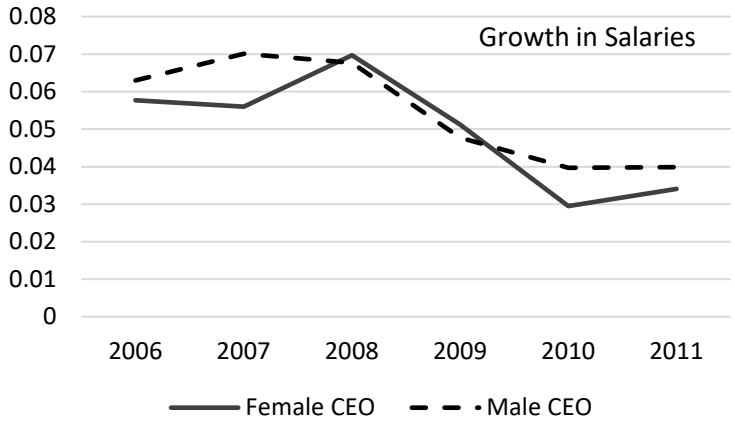
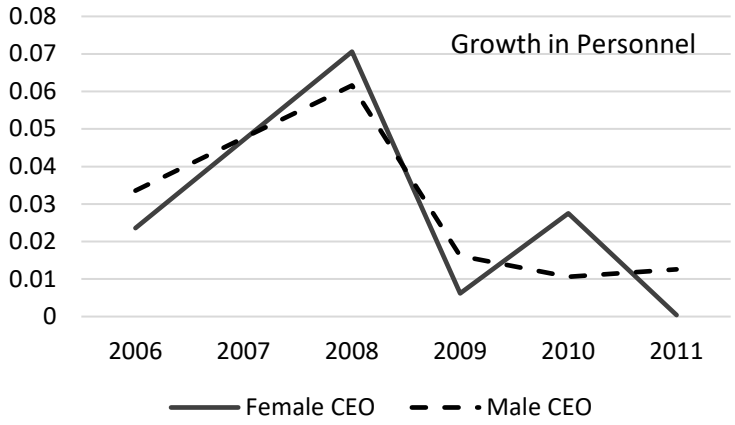


Figure 4: Treatment and control hospitals around the financial crisis. The figures show averages for the growth rates in salaries, growth rates in personnel, and capital investments in the years around the financial crisis for the samples of 168 treatment hospitals with female CEO during the financial crisis, and the 367 control hospitals with male CEOs during the financial crisis. Variables definitions are in Appendix A.





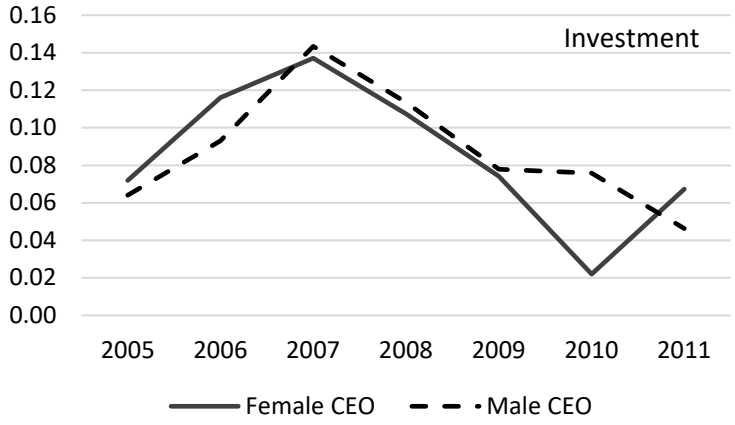


Table 1: Descriptive statistics. The table shows descriptive statistics for 22,924 hospital-years (1,858 hospitals) from 1999 to 2014. Variables definitions are in Appendix A.

Panel A: Descriptive statistics for the full sample

	Mean	Median	Std	P5	P95	N
Service Revenues	184.41	97.47	266.31	8.44	625.87	22,924
Assets	222.71	102.12	372.63	5.92	798.56	22,924
Net Income	0.11	0.08	0.41	-0.26	0.50	21,286
Fixed Assets / Revenues	0.44	0.41	0.26	0.08	0.89	22,747
Salaries / Revenues	0.37	0.38	0.09	0.22	0.50	22,714
Investment	0.07	0.01	0.22	-0.12	0.45	21,251
Contributions Gov.	0.01	0.00	0.03	0.00	0.04	18,824
Contributions Priv.	0.01	0.00	0.03	0.00	0.05	18,824
Leverage	0.26	0.25	0.19	0.00	0.60	21,296
Cash / Assets	0.03	0.01	0.06	0.00	0.15	21,478
Securities / Assets	0.33	0.32	0.22	0.01	0.72	14,445

Panel B: Descriptive statistics by CEO gender

	Female CEOs			Male CEOs		
	Mean	Median	N	Mean	Median	N
Service Revenues	152.36	72.54	3,310	189.82	103.20	19,614
Assets	187.83	73.25	3,310	228.60	108.33	19,614
Net Income	0.13	0.08	3,140	0.10	0.08	18,146
Fixed Assets / Revenues	0.44	0.39	3,283	0.44	0.41	19,464
Salaries / Revenues	0.38	0.38	3,292	0.37	0.37	19,422
Investment	0.06	0.00	3,134	0.07	0.01	18,117
Contributions Gov.	0.01	0.00	2,598	0.01	0.00	16,226
Contributions Priv.	0.02	0.00	2,598	0.01	0.00	16,226
Leverage	0.25	0.23	2,976	0.26	0.25	18,320
Cash / Assets	0.04	0.01	3,004	0.03	0.00	18,474
Securities / Assets	0.34	0.31	2,029	0.33	0.32	12,416
Service Revenues	0.43	0.00	3,300	0.43	0.00	19,540

Table 2: Female CEOs and hospital financing and investment. OLS regressions of an indicator for a female CEO on hospital characteristics. Variables definitions are in Appendix A. Standard errors are in parentheses. Standard errors are clustered at the hospital level. *, **, *** indicate p-values of less than 0.1, 0.05, and 0.01.

Leverage	-0.021	0.017	-0.003	0.018				
	(-0.686)	(0.499)	(-0.067)	(0.455)				
Cash / Assets	-0.036	-0.040	0.079	0.044				
	(-0.359)	(-0.520)	(0.563)	(0.435)				
Securities / Assets			0.025	0.006				
			(0.687)	(0.166)				
Investment					-0.004	-0.001		
					(-0.294)	(-0.101)		
Competition Rank							0.036***	0.010
							(3.654)	(0.981)
Log(Service Revenues)	-0.040***	-0.026	-0.045***	-0.043**	-0.042***	-0.027*	-0.035***	-0.042***
	(-6.183)	(-1.554)	(-5.183)	(-1.987)	(-6.657)	(-1.733)	(-5.818)	(-6.480)
Net Income	0.019	0.006	0.014	-0.009	0.029**	0.008	0.027**	0.029**
	(1.315)	(0.610)	(0.700)	(-0.678)	(2.052)	(1.096)	(1.985)	(2.128)
Density Decile HSA	0.010***		0.008**		0.011***			0.010***
	(3.474)		(2.374)		(3.795)			(3.459)
Top City	0.107**		0.113**		0.113**			0.094*
	(2.431)		(2.291)		(2.496)			(1.910)
N	18598	18665	12004	12038	21169	21251	20959	20959
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Hospital FE	N	Y	N	Y	N	Y	N	N

Table 3: Female CEOs and hospital charity. OLS regressions of an indicator for a female CEO on hospital characteristics. Variables definitions are in Appendix A. Standard errors are in parentheses. Standard errors are clustered at the hospital level. *, **, *** indicate p-values of less than 0.1, 0.05, and 0.01.

Pct. Unemployed	-0.001					
	(-0.451)					
Log(Median Income)		-0.012				
		(-0.355)				
Medicare Days			-0.003	0.022		
			(-0.059)	(0.640)		
Medicare Days			0.027	-0.004		
			(0.442)	(-0.077)		
Contributions Private					0.231	0.119
					(0.992)	(0.888)
Contributions Government					-0.248	0.126
					(-1.478)	(0.780)
Log(Service Revenues)	-0.041***	-0.041***	-0.041***	-0.024	-0.041***	-0.027
	(-6.573)	(-6.630)	(-6.601)	(-1.636)	(-6.269)	(-1.568)
Net Income	0.028**	0.028**	0.028**	0.007	0.018	0.000
	(2.011)	(2.042)	(2.035)	(0.949)	(1.210)	(0.057)
Density Decile HSA	0.011***	0.011***	0.011***		0.011***	
	(3.805)	(3.451)	(3.796)		(3.659)	
Top City	0.114**	0.109**	0.109**		0.118**	
	(2.519)	(2.402)	(2.379)		(2.498)	
N	21204	21204	21204	21286	17506	17572
Year FE	Y	Y	Y	Y	Y	Y
Hospital FE	N	N	N	Y	N	Y

Table 4: Geographic variation in the frequency of female CEOs, executives, and trustees. The dependent variable is equal one if the hospital CEO is female and is zero otherwise (Panel A), the fraction of women on all non-CEO executives of the hospital (panel B), and the fraction of women on all non-CEO trustees of the hospital (Panel C). The main independent variable *Demographic Var.* is in the column heading. In the last column, the sample is limited to the metropolitan area associated with the top city. Hospital controls are *Log(Service Revenues)*, *Net Income*, and *System Dummy*. Variables definitions are in Appendix A. Standard errors are in parentheses. Standard errors are clustered at the hospital level. *, **, *** indicate p-values of less than 0.1, 0.05, and 0.01.

Demographic Var.:	Population Decile HSA	Density Decile HSA	Top City	Top City within Metro Area
Panel A: Dependent variable =1 if the CEO is female				
Demographic Var.	0.013***	0.014***	0.164***	0.149***
	(0.003)	(0.003)	(0.044)	(0.048)
N	21169	21169	21251	2892
Year FE	Y	Y	Y	Y
Hospital Controls	Y	Y	Y	Y
Panel B: Fraction of women on all non-CEO executives				
Demographic Var.	0.000	0.002	0.011	0.001
	(0.001)	(0.001)	(0.017)	(0.020)
N	20677	20677	20751	2698
Year FE	Y	Y	Y	Y
Hospital Controls	Y	Y	Y	Y
Panel C: Fraction of women on all non-CEO trustees				
Demographic Var.	-0.000	-0.001	-0.003	-0.003
	(0.001)	(0.001)	(0.013)	(0.015)
N	20573	20573	20645	2677
Year FE	Y	Y	Y	Y
Hospital Controls	Y	Y	Y	Y

Table 5: Donations and CEO gender. Panels A and B show OLS regressions of the outcome variables in the column headings on an indicator for female CEO, hospital fixed effects, and year fixed effects, estimated separately for high-density and low-density Hospital Service Areas (HSAs). *High-density HSAs* are defined as those with above-median population density (using population-weighted median) based on the 2010 U.S. Census. The OLS regressions in Panel C are estimated on the full hospital sample, and the dependent variables include an interaction of the indicator for female CEOs and the indicator for high-density HSA. *Private and Government Contributions* are scaled by service revenues. *Income Before Contributions* is scaled by lagged fixed assets. Variables definitions are in Appendix A. Standard errors are in parentheses. Standard errors are clustered at the hospital level. *, **, *** indicate p-values of less than 0.1, 0.05, and 0.01.

	Private Contributions	Government Contributions	Growth in Service Revenue	Income Before Contributions	Cash / Assets
Panel A: High-density HSAs					
Female CEO	0.009**	0.002	0.002	-0.007	0.014*
	(0.004)	(0.006)	(0.007)	(0.030)	(0.008)
Hospital FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
	4868	4868	5585	5354	5472
Panel B: Low-density HSAs					
Female CEO	-0.000	-0.001	-0.005	0.013	-0.005
	(0.002)	(0.001)	(0.009)	(0.023)	(0.005)
Hospital FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
	11421	11421	13360	12832	13024
Panel C: All HSAs					
Female CEO*High density HSA	0.009**	0.003	0.001	-0.041	0.020**
	(0.004)	(0.006)	(0.011)	(0.038)	(0.010)
Female CEO	-0.000	-0.001	-0.004	0.022	-0.004
	(0.002)	(0.001)	(0.009)	(0.025)	(0.005)
High density HSA	0.000	-0.001	0.022	0.098*	-0.001
	(0.002)	(0.001)	(0.016)	(0.059)	(0.012)
Hospital FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
	16289	16289	18945	18186	18496

Table 6: Matched samples of hospitals with male and female CEOs. The table shows descriptive statistics 168 hospitals with female CEOs in 2007 and a matched sample of 367 hospitals with male CEOs (using the k-nearest neighbors matching with k=3). The table reports the weighted means and medians for the matched and treated samples in 2007. Hospitals are matched on *Revenues Services, System Dummy, Density Decile HSA, Salaries / Revenues, Net Income, Leverage,* and *Investment* in 2007. Variables definitions are in Appendix A.

	Treatment (N=168)		Control (N=367)			
	Mean	Median	Mean	Median	Dif.	T
Service Revenues	137.07	67.29	153.21	94.04	-16.14	-0.86
Net Income	0.23	0.12	0.20	0.11	0.03	0.50
Density Decile HSA	4.30	3.00	4.59	4.00	-0.28	-0.91
System Dummy	0.38	0.00	0.36	0.00	0.02	0.44
Compensation/Rev	0.38	0.37	0.38	0.38	0.00	-0.21
PPE/Revenue	0.42	0.36	0.43	0.40	-0.01	-0.54
Investment	0.14	0.05	0.14	0.04	-0.01	-0.23
Contributions Gov.	0.00	0.00	0.01	0.00	0.00	-2.38
Contributions Private	0.02	0.00	0.01	0.00	0.00	0.68
Medicaid Days	0.20	0.15	0.21	0.16	-0.01	-0.56
Medicare Days	0.50	0.52	0.47	0.49	0.03	1.94
Leverage	0.24	0.24	0.24	0.24	0.00	-0.09
Cash / Assets	0.03	0.00	0.03	0.00	0.00	0.79
Securities / Assets	0.35	0.29	0.34	0.32	0.01	0.46

Table 7: Hospitals' response to the financial crisis as a function of CEO gender. The table shows OLS regressions of outcome variables listed in column headings estimated on a hospital panel from 2006 through 2011. The *Post_Crisis* dummy is set to one for years 2009 through 2011. The treatment sample includes 168 hospitals with female CEOs in 2007 through at least 2009. The matched control sample includes 367 hospitals with male CEOs in 2007 through at least 2009. Variables definitions are in Appendix A. Standard errors are in parentheses. Standard errors are clustered at the hospital level. *, **, *** indicate p-values of less than 0.1, 0.05, and 0.01.

Dependent Var.:	Growth in Services	Net Income	Growth in Salaries	Growth in Personnel	Medicaid Days	Investment	Contrib. Gov.	Contrib. Private
Panel A: Full Sample								
Post_Crisis*Female	-0.008	0.004	0.002	-0.003	0.001	-0.019	-0.000	-0.002
	(0.010)	(0.059)	(0.008)	(0.010)	(0.008)	(0.025)	(0.005)	(0.003)
Hospital FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
N	2883	2868	2859	2882	2887	2863	2266	2266
Panel B: Treatment Sample (Female CEOs)								
Post_Crisis	-0.035***	-0.073	-0.023***	-0.022***	0.007	-0.068***	0.006*	-0.006*
	(0.008)	(0.049)	(0.006)	(0.008)	(0.006)	(0.019)	(0.004)	(0.003)
Hospital FE	Y	Y	Y	Y	Y	Y	Y	Y
N	913	909	910	912	914	907	717	717
Panel B: Control Sample (Male CEOs)								
Post_Crisis	-0.026***	-0.079**	-0.025***	-0.019***	0.006	-0.048***	0.006*	-0.003**
	(0.006)	(0.033)	(0.006)	(0.006)	(0.005)	(0.017)	(0.004)	(0.002)
Hospital FE	Y	Y	Y	Y	Y	Y	Y	Y
N	1970	1959	1949	1970	1973	1956	1549	1549

Table 8: Descriptive statistics for the gender gap analysis. The table shows descriptive statistics by CEO gender for the samples used in the gender gap analysis. Panel A shows the baseline sample of standalone hospitals during 1999-2014. Hospitals with CEOs holding the position in multiple organizations are excluded. Panel B shows the sample of all hospitals during the years for which data on salaries from related organizations is reported on the IRS Form 990. *Salary* is the CEO salary received from its own organization. *Salary (incl. related org.)* is the CEO's salary from its own and related organizations. *Multiple Positions* is a dummy equal to one if the CEO holds the position in multiple organizations. Other variables definitions are in Appendix A.

Panel A: Standalone hospitals 1999-2014

	Mean	Median	Std	P5	P95	N
Female CEOs						
Salary	368.50	236.79	422.93	86.41	1057.79	1,162
Tenure*	5.19	4.00	3.40	1.00	12.00	495
Service Revenues	129.96	53.02	195.18	7.72	514.19	1,162
Density Decile HSA	3.22	1.00	3.14	1.00	10.00	1,162
Top City	0.07	0.00	0.25	0.00	1.00	1,162
Male CEOs						
Salary	413.14	321.45	531.32	111.03	957.75	7,372
Tenure*	5.22	5.00	3.27	1.00	11.00	1,930
Service Revenues	152.36	88.51	208.28	10.71	476.41	7,372
Density Decile HSA	2.75	2.00	2.49	1.00	9.00	7,354
Top City	0.04	0.00	0.19	0.00	0.00	7,372

Panel B: All hospitals 2008-2014

	Mean	Median	Std	P5	P95	N
Female CEOs						
Salary (incl. related org.)	465.04	349.16	443.83	110.03	1165.66	1,276
Tenure*	4.79	4.00	3.27	1.00	11.00	980
Multiple Positions	0.17	0.00	0.37	0.00	1.00	1,276
Service Revenues	163.94	77.78	235.91	6.54	596.94	1,276
Density Decile HSA	3.24	2.00	2.88	1.00	10.00	1,276
Top City	0.06	0.00	0.24	0.00	1.00	1,276
Male CEOs						
Salary (incl. related)	629.10	464.24	638.26	130.21	1674.40	6,337
Tenure*	4.91	4.00	3.23	1.00	11.00	4,093
Multiple Positions	0.22	0.00	0.41	0.00	1.00	6,337
Service Revenues	214.11	112.16	319.21	10.91	723.02	6,337
Density Decile HSA	3.23	2.00	2.71	1.00	9.00	6,330
Top City	0.03	0.00	0.18	0.00	0.00	6,337

* Tenure is measured as the number of years the CEO is in office during the sample period, and it is reported in this table only for CEOs that took office during 2000-2014 and for whom the first year in office can be inferred from the data.

Table 9: Gender Gap in CEO pay. The table shows OLS regressions of the logarithm of CEO salary on an indicator for female CEOs, hospital characteristics, and a measure of CEO tenure. Hospitals that are part of a system and CEOs holding positions outside of the hospital are excluded. Variables definitions are in Appendix A. Standard errors are in parentheses. Standard errors are clustered at the hospital level. *, **, *** indicate p-values of less than 0.1, 0.05, and 0.01.

Panel A: Full sample regressions

	Dependent Variable = Log (CEO Salary)			
Female CEO	-0.219***	-0.050	-0.082***	-0.043
	(0.065)	(0.034)	(0.029)	(0.056)
Log(Service Revenues)		0.476***	0.429***	0.230***
		(0.012)	(0.012)	(0.055)
Net Income			0.055	0.042*
			(0.035)	(0.024)
Growth in Revenues			-0.105*	-0.060
			(0.061)	(0.074)
Contributions Gov.			0.344**	-0.044
			(0.155)	(0.218)
Contributions Private			1.993***	0.531
			(0.317)	(0.361)
Density Decile HSA			0.044***	
			(0.005)	
Top City			-0.123**	
			(0.063)	
CEO Tenure			0.039***	0.038***
			(0.003)	(0.005)
Year FE	Y	Y	Y	Y
Hospital FE	N	N	N	Y
N	8518	8515	6240	6577

Panel B: Regressions by time period

	Years 1999-2006			Years 2006-2014		
Female CEO	-0.186**	-0.028	-0.082**	-0.239***	-0.062	-0.081**
	(0.077)	(0.040)	(0.033)	(0.072)	(0.041)	(0.037)
Log(Service Revenues)		0.452***	0.388***		0.494***	0.465***
		(0.016)	(0.016)		(0.013)	(0.013)
Hospital controls	N	N	Y	N	N	Y
Year FE	Y	Y	Y	Y	Y	Y
N	4119	4119	3502	4399	4399	3078

Internet Appendix

Table A1: Descriptive statistics for Hospital Service Areas (HSAs) by population density. Hospital Service Areas are split based on population-weighted density median using 2010 U.S. Census data. The variables are defined in Appendix A.

	Below-median density HSAs		Above-median density HSAs	
	Mean	Median	Mean	Median
Population (thousands)	165.98	61.12	754.41	443.88
Density (residents / sq. mile)	135.06	86.23	5063.77	2041.16
Democrat	0.42	0.43	0.57	0.57
Pct. Unemployed	8.12	7.86	9.1	8.86
Median Income	58.54	57.72	78.05	72.48
Median Age	39.88	39.59	37.42	37.45
Educational Att. (women)	0.35	0.34	0.46	0.44
Educational Att. (men)	0.33	0.32	0.46	0.45
Number of Hospitals	1.94	1.00	5.02	3.00
Service Revenues	130.47	51.6	353.71	180.86
System dummy	0.33	0.00	0.29	0.0
Net Income	0.13	0.08	0.15	0.09

Table A2: Descriptive statistics for samples used in the gender gap analysis. Panel A shows the sample for years 1999-2014 with available CEO salary data. The left panel shows all hospitals, and the right panel excludes hospitals that belong to systems or in which the CEO holds the position in multiple organizations in the same year. Panel B shows the sample for years 2008-2014 for which information on CEO salary from related organizations is available on the IRS Form 990. The left panel includes all hospitals, and the right panel includes only hospitals with available CEO salary data. Variables definitions are in Appendix A.

Panel A: Sample period 1999-2014

	All hospitals with salary data			Standalone hospitals with salary data		
	Mean	Median	N	Mean	Median	N
Service Revenues	180.06	96.19	13,251	149.31	83.02	8,534
Assets	224.54	104.60	13,251	189.91	86.14	8,534
Net Income	0.11	0.08	12,309	0.10	0.08	7,888
Fixed Assets / Rev.	0.45	0.42	13,149	0.45	0.42	8,469
Salaries / Revenues	0.38	0.38	13,170	0.39	0.39	8,468
Investment	0.07	0.01	12,294	0.07	0.01	7,876
Contributions Gov.	0.01	0.00	10,915	0.01	0.00	7,146
Contributions Priv.	0.01	0.00	10,915	0.01	0.00	7,146
Leverage	0.27	0.26	12,651	0.27	0.26	8,314
Cash / Assets	0.03	0.01	12,391	0.04	0.01	7,979
Securities / Assets	0.33	0.32	8,736	0.32	0.32	5,740
System dummy	0.30	0.00	13,206	0.00	0.00	8,498

Panel B: Sample period 2008-2014

	All hospitals			All hospitals with salary data		
	Mean	Median	N	Mean	Median	N
Service Revenues	205.04	102.62	10,450	205.70	103.59	7,613
Assets	254.23	107.04	10,450	257.89	111.05	7,613
Net Income	0.10	0.08	10,243	0.11	0.08	7,475
Fixed Assets / Rev.	0.46	0.41	10,291	0.47	0.42	7,488
Salaries / Revenues	0.37	0.37	10,338	0.37	0.37	7,535
Investment	0.06	0.00	10,208	0.06	0.00	7,455
Contributions Gov.	0.01	0.00	6,592	0.01	0.00	4,515
Contributions Priv.	0.01	0.00	6,592	0.01	0.00	4,515
Leverage	0.26	0.25	8,858	0.26	0.25	6,355
Cash / Assets	0.04	0.01	9,078	0.04	0.01	6,487
Securities / Assets	0.33	0.32	7,422	0.33	0.33	5,676
System dummy	0.47	0.00	10,410	0.46	0.00	7,576

Table A3: Gender Gap in CEO pay: including salaries from related organizations. The table shows OLS regressions of the logarithm of CEO salary (including pay from related organizations) on an indicator for female CEOs, hospital characteristics, and a measure of CEO tenure. The sample period is limited to 2008-2014 due to availability of data on pay from related organizations. Variables definitions are in Appendix A. Standard errors are in parentheses. Standard errors are clustered at the hospital level. *, **, *** indicate p-values of less than 0.1, 0.05, and 0.01.

	Dependent Variable = Log (CEO Salary)				
Female CEO	-0.279***	-0.247***	-0.101***	-0.102***	-0.086
	(0.047)	(0.045)	(0.032)	(0.031)	(0.081)
System Dummy		0.172***	0.032	0.084***	0.125*
		(0.035)	(0.026)	(0.025)	(0.075)
Multiple Positions		0.565***	0.585***	0.513***	0.166**
		(0.041)	(0.038)	(0.041)	(0.077)
Log(Service Revenues)			0.374***	0.383***	0.044
			(0.013)	(0.013)	(0.074)
Net Income				0.077**	0.000
				(0.038)	(0.043)
Growth in Revenues				-0.021	0.011
				(0.092)	(0.110)
Contributions Gov.				0.433***	0.082
				(0.159)	(0.268)
Contributions Private				1.721***	0.052
				(0.323)	(0.438)
Density Decile HSA				0.048***	
				(0.005)	
Top City				-0.014	
				(0.082)	
CEO Tenure				0.035***	0.049***
				(0.003)	(0.005)
Year FE	Y	Y	Y	Y	Y
Hospital FE	N	N	N	N	Y
N	7613	7576	7576	4472	4475