# Retired bureaucrats on the Board of Directors :Do they Improve Firm Performance

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**ABSTRACT**

We aim to study investors' short-term reactions and long-term effects on the firm performance to the appointment of ex-bureaucrats on the board of firms listed on the National Stock Exchange. Firstly, we divide the firms into regulated and non-regulated sectors to study the difference in the effect of investor reaction and long-term firm performance when ex-bureaucrats are appointed on the corporate board. Secondly, we examine whether there is a variation in the value-added and firm performance by the appointment of the ex-bureaucrats basis their gender. We find that investors perceive the appointment of ex-bureaucrats as a value-reducing event, especially if the ex-bureaucrat is female and appointed to the board of a regulated industry. However, the long-term study shows that appointing ex-bureaucrats on the board of the regulated sector improves firm performance. Further, we find that Men ex-bureaucrat appointment in the regulated sector results in better firm performance than the appointment of women ex-bureaucrat. This study has implications for firms, especially in the regulated sector, regarding the choice of directors on their boards.

Keywords: Boards of directors, Ex-Bureaucrats, Gender diversity

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## 1. Introduction

India Inc. is seeking retired bureaucrats on the board, especially those who held important positions in the various ministries (Print, 2019). Increasingly, they are joining the board of companies even before their official cooling-off period is over after retirement (Express, 2021). According to the all India services rules, bureaucrats have to take a one-year gap before they are associated with the boards of companies. However, special permissions from governments allow them to take up such positions before the one-year cooling period. Why are retired bureaucrats a prized catch for private companies? Are ex-bureaucrats the missing link between corporates and the government, or are they an integral part of the board bringing their vast experience in directing firms' strategy? We try to answer these questions in our study.

The Union Public Service Commission (UPSC) holds an annual examination to appoint bureaucrats called the Indian Civil Services Examination. Administrative positions for which bureaucrats are employed are highly prestigious, and the competitive exam is extremely tough to clear, with over 10 lakh persons applying for 1000 such positions (Hindu, 2021). After being chosen, they must go through rigorous training for several years before being assigned to administrative positions. Bureaucrats are noted for the intellectual capital and network capital they accumulate during their tenure in government, making them a valuable resource on corporate boards.

The role of the board of directors on corporate boards has been extensively studied (Bathala and Rao, 1995; Hillman, Cannella, and Paetzold, 2000). According to the agency theory, the board of directors is responsible for actively overseeing management and protecting the interests of the shareholders (Jensen and Meckling, 1976). The board composition, on the other hand, appears to change depending on the nature of the firm's operation. The board of directors, according to the resource dependency theory, gives resources to the organisation. The board is made up of directors with experience in business concerns, such as financial, marketing, operations, or industry specialists who have held c-level [2] positions in other companies or business consultants

[2]C-level, commonly known as the C-suite, refers to high-ranking executive positions inside a corporation. The letter C represents "chief" in this sense, as in chief executive officer and chief operating officer.

with an understanding of technology and overseas markets. We also see that boards include directors with non-business competence, such as legal expertise, academic experience, arts, or government experience, such as ex-bureaucrats.

Businesses in highly regulated industries must deal with government policy uncertainty. It would be critical for such a company's success to have a resource who can forecast changes in public policy and work with the company to adapt to those changes. Ex-bureaucrats would be an excellent resource because of their greater human and network capital, especially for liaising with the external regulatory environment such as the government. They have inside knowledge of policy corridors and government procedures and the ability to predict future government policies. Many of them who retire have their subordinates who take up their vacant positions of influence in these bureaucratic circles. Thus, they provide the board with the required influential access to policy circles and add diversity to the board; most comprise directors with business backgrounds. Literature has examined that board diversity increase firm performance (e.g., (Ararat, Aksu, and Tansel Cetin, 2015; Fernández-Temprano and Tejerina-Gaite, 2020)).

Gender diversity, more than any other diversity on the board, has been identified as having the potential to create value for the company in the literature (e.g., (Kang, Ding, and Charoenwong, 2010; Sarkar and Selarka, 2021)). Thus, firms that hire an ex-bureaucrat must benefit more from recruiting a women ex-bureaucrat, who brings the required director capital and the added value of gender diversity. Despite this, barely 10% of ex-bureaucrats on company boards are women, whereas serving women civil servants account for more than 20% of the administrative services(Standard, 2022). Therefore, it is interesting to understand the reason behind the disparity seen in the appointments of directors based on gender, which has not been explored before.Women ex-bureaucrats are as competent as men ex-bureaucrats as they go through the same competitive examination. Further, they add gender diversity to the board. Thus, firms that hire an ex-bureaucrat must benefit more from recruiting a women ex-bureaucrat, who brings the required director capital and the added value of gender diversity.

Literature has examined the effect of political connections on firms' performance

(Hillman, 2005) and has barely examined the role of ex-bureaucrats on a firm's board. However, there are differences between politicians and ex-bureaucrats. Politicians have different educational levels less administrative experience, and their network depends on whether they are in power or not. On the other hand, bureaucrats have a good education, training in administrative services, administrative experience throughout their career. They take up important positions in ministries such as additional secretaries and play a critical role in designing, drafting, implementing various policies. They are selected through highly competitive examination and develop a network capital throughout their career. Thus, the resources provided by the ex-bureaucrats are in some sense different from the resources provided by the politicians. Some studies have examined the determinants of the firm characteristics that appoint ex-bureaucrats. Regulated firms with foreign ownership have more propensity to hire ex-bureaucrats (Awasthi and Pallathitta, 2017). Further, the authors suggested that future researchers should explore the performance-related consequences of ex-bureaucrat appointment on firms' boards. This is the gap that we are addressing in our paper.

In this study, we aim to understand whether ex-bureaucrats on the board of regulated firms improve the shareholder wealth by looking at the short-term investor reaction using an event study methodology and long-term firm performance. We further account for endogeneity in board composition by employing a propensity score matching for the regulated and non-regulated firms. Moreover, we aim to understand the reason behind the disparity seen in the appointments of directors based on gender, which has not been explored before. We examine whether gender has any significant difference in the firm performance in both the short-term and long-term, in the matters of ex-bureaucrats taking up directorship in corporate boards.

The rest of the paper is organized as follows. The section 2 develops research propositions. Section 3 describes the research design. Section 4 presents the results of short-term market reaction using event study, long term firm performance using propensity score matching technique and the co-variate balance diagnostics for each proposition. The robustness results to test our propositions are presented in Section 5. The paper concludes with a summary of our work and directions for future research

in Section 6.

## 2. Research Questions

A firm would always prefer to optimise the selection of the director to the board in order to gain the most benefit from the pick for the least cost given the available choice set of directors and supply limitations. For example, if a choice set consists of multiple individual directors with the same ability set, the amount of benefit they can provide will be nearly identical. As a result, the corporation will make no distinction between them. However, if the amount of benefit provided by each director differs, the firm will choose the one who provides the most advantage and satisfy the economic needs of the firm.

According to Salancik and Pfeffer (1978), boards of directors provide four primary benefits. They are (1) provision of expertise and advice (2) provide communication channels between external organizations and the firm; (3)access to resources and support from outside the firm and (4) legitimacy. Keeping in view of these benefits, we classify the benefits that directors provide to companies into three categories: natural or inherent ability that provides expertise, network connections that help in obtaining resources and support from outside the firm, and ex-bureaucrats, who provide communication channels between external organizations(government) and the firm.

A firm will choose the director who will satisfy its resource demands taking into account their costs and benefits. This is in line with the resource dependency theory, which emphasizes that the board is a provider of resources to the organization (Salancik and Pfeffer, 1978). The firm which falls under a highly regulated industry needs to deal with policy uncertainty. A critical resource for such a firm would be a resource that has the ability to anticipate the public policy changes and help the firm in adapting to such changes, thus reducing uncertainty in the business. Such a resource would be an ex-bureaucrat, who will have inside knowledge of policy corridors, government procedures, and their expertise in predicting future government policies, which is valuable for a firms' profitability. Moreover, they have connections with their successors

who occupy vacant positions of influence in these bureaucratic circles. Therefore, the firm in a highly regulated industry, whose revenues are influenced by governments' decisions, would hire an ex-bureaucrat as a director to reduce such uncertainty regarding the policy changes, thereby reducing transactions costs due to external changes and improving the firm's performance and survival.

Therefore we argue that stock markets would react positively when civil servants are hired by the regulated industries. Further, the ex-bureaucrats would subsequently add value to the firm in the long-term. We, therefore hypothesize the following:

**Proposition 1.** *Stock market reacts more positively when firms appoint ex-bureaucrats on the board of regulated industry firms compared to non-regulated industry firms.*

**Proposition 2.** *The value to shareholders of regulated industry firms increases more compared to non-regulated industry firms which have ex-bureaucrats on boards.*

All the bureaucrats have to clear a highly competitive examination and undergo a rigorous training before getting inducted into the civil services. Therefore, there is no reason to believe that women ex-bureaucrats are less competent than their counterparts. Further, being women on the board, they also bring the benefits of gender diversity to the board, which add higher value to the firm as documented in the extant literature (Kang, Ding, and Charoenwong, 2010; Sarkar and Selarka, 2021). Thus, firms that hire an ex-bureaucrat must benefit more from recruiting a women ex-bureaucrat, who bring the required director capital and the added value of gender diversity to the firm. Therefore, we posit the following:

**Proposition 3.** *Appointments of women ex-bureaucrats on the boards of regulated firms will have more positive stock market reaction compared to men ex-bureaucrats appointments.*

**Proposition 4.** *Women ex-bureaucrats on the boards of regulated firms will have more increase in shareholder wealth in the long term compared to men ex-bureaucrats appointments.*

## 3. Research Design

### *3.1. Sample*

The sample for the analysis consists of the firms listed on the National Stock Exchange (NSE) from 01st April 2009 to 31st March 2019. We obtained the data of board appointments for 1,698 companies from the Indian Boards Database provided by PRIME, during the sample period. The confounding events that might affect the market reaction like dividend payments, stock-splits, announcement of results , etc. are removed from the sample. The daily returns data was obtained from CMIE Prowess from 01st April 2008 [3] to 30th March 2018. To facilitate the comparison of regulated and non-regulated firms, we divided the firms into these categories as suggested in the literature (Awasthi et al., 2019). We removed financial and government firms from the sample.

The total number of directors, non-ex-bureaucrats, and ex-bureaucrats appointed to corporate boards from the fiscal years 2009 through 2018 is shown in Table 1 . Because of significant amendments to the Indian Companies Act 2013 regulating the composition and size of the board, we note that the overall number of director appointments on the board more than doubled in 2014. This has shown a rise in the hiring of former bureaucrats. Further, the act has mandated at least one woman director on corporate boards of listed companies. We also observe an increase in the percentage of appointments of women ex-bureaucrats, whereas decrease in men ex-bureaucrats appointments as shown in figure 1.

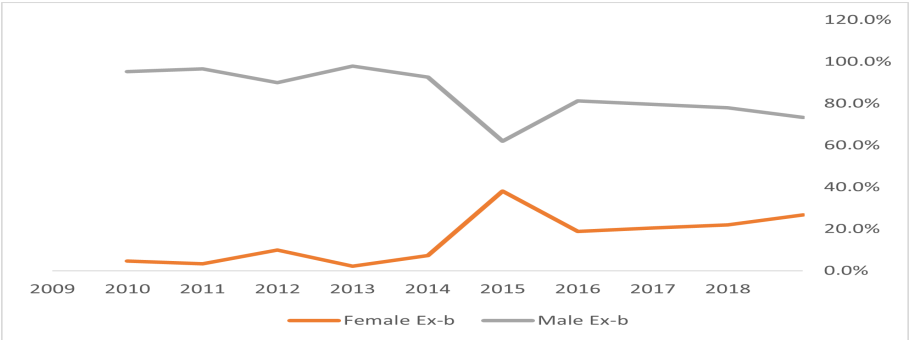



Figure 1.: Men vs. Women Ex-b appointments

[3] 365 days before the event period

Table 1.: Sample details by year

| Year(fiscal year) | No. of appointments | Non Ex-bureaucrat appointments | Ex-bureaucrat appointments | % | Multiple Ex-bureaucrat appointments | % | Female Ex-bureaucrat | % Ex-bureaucrat | Male | % |
|---|---|---|---|---|---|---|---|---|---|---|
| 2009 | 619 | 576 | 43 | 6.95% | 5 | 0.81% | 2 | 0.32% | 41 | 6.62% |
| 2010 | 525 | 495 | 30 | 5.71% | 2 | 0.38% | 1 | 0.38% | 29 | 5.52% |
| 2011 | 575 | 545 | 30 | 5.22% | 5 | 0.87% | 3 | 0.35% | 27 | 4.70% |
| 2012 | 631 | 584 | 47 | 7.45% | 14 | 2.22% | 1 | 0.32% | 46 | 7.29% |
| 2013 | 611 | 570 | 41 | 6.71% | 3 | 0.49% | 3 | 0.33% | 38 | 6.22% |
| 2014 | 1,331 | 1,260 | 71 | 5.33% | 7 | 0.53% | 27 | 0.15% | 44 | 3.31% |
| 2015 | 689 | 657 | 32 | 4.64% | 2 | 0.29% | 6 | 0.29% | 26 | 3.77% |
| 2016 | 692 | 643 | 49 | 7.08% | 13 | 1.88% | 10 | 0.29% | 39 | 5.64% |
| 2017 | 790 | 749 | 41 | 5.19% | 5 | 0.63% | 9 | 0.25% | 32 | 4.05% |
| 2018 | 966 | 906 | 60 | 6.21% | 6 | 0.62% | 16 | 0.21% | 44 | 4.55% |
| Total | 7,429 | 6,985 | 444 | 5.98% | 62 | 0.83% | 78 | 1.05% | 366 | 21.31% |

Table 2.: Sample details by Industry

| Industry | No. of appointments | Non Ex-bureaucrat appointments | Ex-bureaucrat appointments | % | Multiple Ex-bureaucrat appointments | % |
|---|---|---|---|---|---|---|
| Non-regulated | 6,395 | 6,049 | 346 | 5.41% | 49 | 0.77% |
| Regulated | 1,034 | 936 | 98 | 9.48% | 13 | 1.26% |
| Total | 7,429 | 6,985 | 444 | 5.98% | 62 | 0.83% |

### *3.2. Variables*

Table 3 captures the list of variables and their description.

Table 3.: Dependent Variable(DV), Independent Variable(IV) and Control Variable(CV)

| Variables | Type | Description |
|---|---|---|
| Ex-B | IV | A dummy variable for Ex-bureaucrat appointment (Ex-B=1) or not(Ex-B=0) |
| Gender | IV | A dummy variable for Men Ex-bureaucrat appointment (Gender=1) or Women Ex-bureaucrat appointment (Gender=0) |
| REG | IV | A dummy variable for regulated (REG=1) or not(REG=0) |
| $ROA_{t+1}$ | DV | Return on Assets defines as Net income divided by Total Assets. |
| ROA | CV | Return on Assets defined as Net income divided by Total Assets |
| LEV | CV | Leverage defined as Total debt divided by total assets of the financial year prior to the appointment |
| CR | CV | Current Ratio defined as Current assets divided by current liabilities of the financial year prior to the appointment |
| SIZE | CV | Logarithmic value of total assets of the financial year prior to the appointment |
| MVBV | CV | Market value/Book value of the equity of the financial year prior to the appointment |
| RISK | CV | The standard deviation of the stock returns of the financial year prior to the appointment |
| %ind | CV | Percentage of independent directors on the firms' board of the financial year prior to the appointment |
| %fem | CV | Percentage of women directors on the board of the financial year prior to the appointment. |
| bsize | CV | The size of the board of a company of the financial year prior to the appointment |
| nciv | CV | Percentage of ex-bureaucrat directors on the board of the financial year prior to the appointment. |
| Age | CV | Age of the firm prior to the appointment |
| PrOWN | CV | Promoter ownership of the firm prior to the appointment |
| AFF | CV | Company affiliation as Business group, Standalone, Foreign. |
| Industry | CV | Industry-fixed effects |
| Year | CV | Year effects |

Table 4.: Summary Statistics

| Variable | Obs | Mean | Std. | Min | Max |
|---|---|---|---|---|---|
| Ex-B | 7,429 | 0.06 | 0.24 | 0.00 | 1.00 |
| RISK | 7,206 | 0.03 | 0.01 | 0.00 | 0.25 |
| MVBV | 6,952 | 4.15 | 84.67 | 0.02 | 6981.53 |
| LEV | 7,090 | 2.10 | 13.17 | 0.00 | 528.32 |
| $ROA_{t+1}$ | 7,404 | 2.83 | 10.79 | -318.74 | 77.07 |
| $ROA_{t-1}$ | 9059 | 4.01 | 9.54 | -96.13 | 110.75 |
| SIZE | 7,429 | 5.20 | 1.69 | -1.02 | 11.46 |
| PrOWN | 7,372 | 53.97 | 15.95 | 0.00 | 93.15 |
| %ind | 7,429 | 0.51 | 0.12 | 0.00 | 1.00 |
| %fem | 7,429 | 0.09 | 0.09 | 0.00 | 1.00 |
| bsize | 7,429 | 8.32 | 2.85 | 1.00 | 22.00 |
| nciv | 7,429 | 0.42 | 0.84 | 0.00 | 6.00 |

This tables shows the summary statistics of the variables used in the study except for categorical variables.

### *3.3. Methodology*

#### *3.3.1. Short-term reaction*

We used Event Study methodology to check for abnormal returns on the announcement of the appointment date of ex-bureaucrats segregated by regulated or non-regulated industry. We further examine the role of gender in ex-bureaucrat appointments segregated by industry. The 3 -day (-1,1) and (0,2) & 11-day (-5,5) event windows were considered. A 252-day estimation window starting from -6 to -258 days is taken. The normal returns are estimated using market model. Abnormal returns are calculated by subtracting realized returns if the event had not taken place from actual returns. Cumulative average abnormal returns (CAAR) are calculated for the event windows. Nifty50 index returns are used as a proxy for market returns. We conducted a parametric test (cross-sectional t-test) to test the statistical significance of our findings.

#### *3.3.2. Baseline Regression*

To examine the impact of appointment of ex-bureaucrat on firm performance , we estimate the following baseline empirical model:

$$\begin{aligned} \text{ROA}_{i,t+1} = \alpha + \beta_1 \times \text{Ex-B}_{i,t} + \gamma z_{i,t-1} \\ + \text{Industry}_i + \text{Year}_t + \epsilon_{i,t} \end{aligned} \tag{1}$$

To examine the impact of appointment of Ex-bureaucrat on firm performance of regulated vs. unregulated firms , we estimate the following baseline empirical model:

$$\begin{aligned} \text{ROA}_{i,t+1} = \alpha &+ \beta_1 \times \text{Ex-B}_{i,t} + \beta_2 \times \text{REG}_{i,t} \\ &+ \beta_3 \times \text{Ex-B}_{i,t} \times \text{REG}_{i,t} + \gamma z_{i,t-1} \\ &+ \text{Industry}_i + \text{Year}_t + \epsilon_{i,t} \end{aligned} \tag{2}$$

To examine the impact of appointment of men and women ex-bureaucrats on firm performance , We further take a sample of only Ex-bureaucrat appointments (444 appointments) and we estimate the following baseline empirical model.

$$\text{ROA}_{i,t+1} = \alpha + \beta_1 \times \text{Gender}_i + \gamma z_{i,t-1} + \ \text{Industry}_i + \text{Year}_t + \epsilon_{i,t} \tag{3}$$

To examine the impact of appointment of men and women ex-bureaucrat on firm performance of regulated vs. unregulated firms , we estimate the following baseline empirical model:

$$\begin{aligned} \text{ROA}_{i,t+1} = \alpha &+ \beta_1 \times \text{Gender}_i + \beta_2 \times \text{REG}_{i,t} + \beta_3 \times \text{Gender}_i \times \text{REG}_{i,t} \\ &+ \gamma \times z_{i,t-1} + \text{Industry}_i + \text{Year}_t + \epsilon_{i,t} \end{aligned} \tag{4}$$

*3.3.3. Propensity Score Matching*

We create a control and treatment group using propensity score matching to eliminate the bias that was generated while measuring the average treatment effect in multivariate regression. The matching will reduce the differences between treated and untreated groups, thus providing a model for efficient causal inference and estimation of unobserved potential outcomes(Stuart, 2010). The propensity score matching is generally used to adjust for confounding variables through matching (Rosenbaum and Rubin, 1984). To match the firms, we chose the covariates that impact the propensity of firms to hire an Ex-bureaucrat and affect the outcome variable. We match firms based on the

parameters- Return on Assets (ROA), firm size (SIZE), percentage of independent directors (%ind),percentage of women directors (%ind), the standard deviation of stock returns (RISK), firm age (AGE), and the debt-to-equity ratio (LEV), promoter ownership (PrOWN), a dummy variable for regulated (REG=1) or not(REG=0), company affiliation (AFF). In addition, we control for industry-fixed effects (Industry) and Year effects (Year).

$$
\begin{aligned}
Pr(\text{Ex-B}_{i,t}) = {} & \alpha_0 + \beta_1 \times \text{ROA}_{i,t-1} + \beta_2 \times \text{SIZE}_{i,t-1} + \beta_3 \times \text{LEV}_{i,t-1} + \beta_4 \times \text{RISK}_{i,t-1} \\
& + \beta_5 \times \text{MVBV}_{i,t-1} + \beta_6 \times \text{PrOWN}_{i,t-1} + \beta_7 \times \text{REG}_{i,t} + \beta_8 \times \%\text{ind}_{i,t-1} \\
& + \beta_9 \times \%\text{fem}_{i,t-1} + \beta_10 \times \text{nciv}_{i,t-1} + \beta_11 \times \text{bsize}_{i,t-1} + \beta_12 \times \text{AFF}_i \\
& + \beta_j \times \sum_j \text{Industry}_j + \beta_t \times \sum_t \text{Year}_t + \epsilon_t
\end{aligned} \tag{5}
$$

We matched the treatment group with the control group using kernel matching. Kernel matching is more appropriate as our sample has more observations in the control group than in the treated group, and hence it helps improve precision(Caliendo and Kopeinig, 2008). Kernel matching uses the weighted average of all individuals in the control group to match with the treated group. Therefore, the sample size does not reduce. Hence, we achieve a lower variance of the coefficient. However, it may be possible that bad matches also are used in matching; as a result, a common support condition is imposed (Caliendo and Kopeinig, 2008). We also use other matching techniques, such as caliper matching, to check for the robustness of our results. After kernel matching, we finally got 412 treated and 6302 control samples after kernel matching. We lose some observations due to missing values in the covariates.

After propensity score matching, we perform a multivariate regression similar to double robustness and the logic behind the regression adjustment in randomized experiments. The double robust regression accounts for any residual covariate imbalance that exists in the groups, thus calculating the efficient estimate for the average

treatment effect (ATE) (Stuart, 2010).

$$\begin{aligned} \text{ROA}_{i,t+1} = \alpha + \beta_1 \times \text{Ex-B}_{i,t} + \beta_2 \times \text{REG}_{i,t} + \beta_3 \times \text{Ex-B}_{i,t} \times \text{REG}_{i,t} \\ + \gamma \times z_{i,t-1} + \text{Industry}_i + \text{Year}_t + \epsilon_{i,t} \end{aligned} \tag{6}$$

Similarly, for understanding the effect based on gender, we perform propensity score matching where the propensity to hire a male ex-bureaucrat is calculated followed by a double robust regression.

$$\begin{aligned} Pr(\text{Gender}_{i,t}) = \alpha_0 + \beta_1 \times \text{ROA}_{i,t-1} + \beta_2 \times \text{SIZE}_{i,t-1} + \beta_3 \times \text{LEV}_{i,t-1} + \beta_4 \times \text{RISK}_{i,t-1} \\ + \beta_5 \times \text{MVBV}_{i,t-1} + \beta_6 \times \text{PrOWN}_{i,t-1} + \beta_7 \times \text{REG}_{i,t} + \beta_8 \times \%\text{ind}_{i,t} \\ + \beta_9 \times \%\text{fem}_{i,t-1} + \beta_{10} \times \text{nciv}_{i,t-1} + \beta_{11} \times \text{bsize}_{i,t-1} \\ + \beta_{12} \times \text{AFF}_i + \beta_j \times \sum_j \text{Industry}_j + \beta_t \times \sum_t \text{Year}_t + \epsilon_t \end{aligned} \tag{7}$$

$$\begin{aligned} \text{ROA}_{i,t+1} = \alpha + \beta_1 \times \text{Gender}_{i,t} + \beta_2 \times \text{REG}_{i,t} + \beta_3 \times \text{Gender}_{i,t} \times \text{REG}_{i,t} \\ + \gamma \times z_{i,t-1} + \text{Industry}_i + \text{Year}_t + \epsilon_{i,t} \end{aligned} \tag{8}$$

## 4. Results

### *4.1. Short-term Market Reaction*

Table 5.: Event Study Results

| Event Date | All firms | | | Regulated | | | Non-Regulated | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAAR | t-stat | prob. | CAAR | t-stat | prob. | CAAR | t-stat | prob. |
| (-5...5) | -0.74% | -1.3885 | 17% | -0.97% | -0.8370 | 40% | -0.67% | -1.1155 | 26% |
| (-3...3) | -0.76% | -1.7442 | 8% | -0.50% | -0.5473 | 58% | -0.84% | -1.6934 | 9% |
| (-2...2) | -0.63% | -1.7912 | 7% | 0.19% | 0.2661 | 79% | -0.89% | -2.1774 | 3% |
| (-1...1) | -0.69% | -2.6229 | 1% | -0.40% | -0.7826 | 43% | -0.78% | -2.5457 | 1% |
| (0...0) | -0.25% | -1.5906 | 11% | -0.21% | -0.7169 | 47% | -0.26% | -1.4183 | 16% |
| (0...3) | -0.86% | -2.5328 | 1% | -1.26% | -1.8849 | 6% | -0.74% | -1.8700 | 6% |
| (0...5) | -0.81% | -2.1695 | 3% | -1.84% | -2.9612 | 0% | -0.50% | -1.1023 | 27% |

The table reports CAAR = Cumulative Average Abnormal Returns for men and women ex-bureaucrats appointments. prob= Cross-sectional t test probability
*p<0.1; **p<0.05; ***p<0.01

We find that the market reacted negatively to the appointment of ex-bureaucrats in a 3 day event window (-1,1) and post event windows. This shows that the appointment of ex-bureaucrat is a significant event for the market.

To understand further whether there is a difference between regulated and non-regulated industry, we further check the market reaction. We find that market reacts more negatively for Ex-bureaucrat appointments in non-regulated industry, whereas it is indifferent for appointments in Regulated industry.

Table 6.: Event Study Results-Gender

| Event Date | Male | | | Female | | |
|---|---|---|---|---|---|---|
| | CAAR | t-stat | prob. | CAAR | t-stat | prob. |
| (-5...5) | -0.33% | -0.5462 | 58.49% | -2.80% | -2.4648 | 1.37% |
| (-3...3) | -0.50% | -1.0066 | 31.41% | -2.07% | -2.3716 | 1.77% |
| (-2...2) | -0.36% | -0.9076 | 36.41% | -1.99% | -2.6064 | 0.91% |
| (-1...1) | -0.40% | -1.4141 | 15.73% | -2.09% | -3.2871 | 0.10% |
| (0...0) | -0.24% | -1.3371 | 18.12% | -0.29% | -1.0139 | 31.06% |
| (0...3) | -0.74% | -1.9581 | 5.02% | -1.47% | -1.8800 | 6.01% |
| (0...5) | -0.65% | -1.5549 | 12.00% | -1.64% | -1.9008 | 5.73% |

The table reports CAAR = Cumulative Average Abnormal Returns for men and women ex-bureaucrats appointments. prob= Cross-sectional t test probability
*p<0.1; **p<0.05; ***p<0.01

Table 7.: Event study Results - Gender Industry

| | Regulated | | | | | | Non-Regulated | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Event Date | Male | | | Female | | | Male | | | Female | | |
| | CAAR | t-stat | prob. | CAAR | t-stat | prob. | CAAR | t-stat | prob. | CAAR | t-stat | prob. |
| (-5...5) | -0.18% | -0.1375 | 89% | -4.94% | -2.3113 | 2% | -0.37% | -0.5550 | 58% | -2.15% | -1.6133 | 11% |
| (-3...3) | -0.11% | -0.1028 | 92% | -2.46% | -1.7112 | 9% | -0.62% | -1.1056 | 27% | -1.96% | -1.8460 | 6% |
| (-2...2) | 0.54% | 0.6643 | 51% | -1.57% | -1.3771 | 17% | -0.64% | -1.4132 | 16% | -2.12% | -2.2582 | 2% |
| (-1...1) | 0.14% | 0.2488 | 80% | -3.06% | -2.5264 | 1% | -0.57% | -1.7120 | 9% | -1.79% | -2.4078 | 2% |
| (0...0) | -0.16% | -0.4714 | 64% | -0.46% | -0.9515 | 34% | -0.26% | -1.2589 | 21% | -0.24% | -0.6946 | 49% |
| (0...3) | -0.91% | -1.2211 | 22% | -2.99% | -2.0992 | 4% | -0.68% | -1.5663 | 12% | -1.00% | -1.0886 | 28% |
| (0...5) | -1.34% | -1.9625 | 5% | -4.29% | -3.1851 | 0% | -0.43% | -0.8571 | 39% | -0.83% | -0.8046 | 42% |

The table reports CAAR = Cumulative Average Abnormal Returns for men and women ex-bureaucrats appointments in regulated and non-regulated sector. prob= Cross-sectional t test probability
*p<0.1; **p<0.05; ***p<0.01

We observe that number of female ex-bureaucrat appointments are much lower compared to non-ex-bureaucrat appointments. To understand further how market re-

acts to male and female ex-bureaucrat appointments, we segregate the appointments on gender and evaluate market reaction. We find that in regulated industries, market reacts negatively to appointment of female Ex-bureaucrats and the reaction is significant in a 11 day window (-5,5) and 3-day window (-1,1), whereas the market is indifferent and there is no particular pattern for the appointment of male ex-bureaucrats in the regulated industries. However, we see that market reacts negatively to both male and female ex-bureaucrats appointments in the non-regulated industries, with significant reaction for female ex-bureaucrats. These results show that investors penalize ex-bureaucrat appointments in non-regulated industry, especially female ex-bureaucrats.

### *4.2. Discussion of Event Study Results*

The distinctive resources that women can bring to corporate boards have been noted in literature. Women directors also boost to the board's diversity. As a result, the benefit to the firm of appointing women directors with the same abilities as men directors-intrinsic ability, network connections, and awareness of government policy - would add an additional benefit of diversity to the board. However, research has shown that a men bureaucrats are more connected than women bureaucrats, and hence has more access to policy corridors (Shrivastava, 2015). We see that the number of women civil servants on the top tier of civil services holding prominent positions are very less. Standard (2022) argues that only only 14% of the 92 secretaries to the Indian government were women as on December 3, 2021 . They also suggest that politicians like to deal more with men than women and hence women are given soft postings. As a result, a regulated firm would choose a male civil servant over a female civil servant to maximise the benefit, assuming that the value of a male civil servant's superior knowledge surpasses the benefit of diversity. However,if regulated firms choose to appoint a female civil servant instead of a male civil servant ; this would have caused the market to react negatively for such appointments because the benefit of adding diversity does not compensate for the lack of superior policy connections that men bureaucrats provide. This explains our results of negative market reaction to women ex-bureaucrats appointments on the board.

### *4.3. Baseline Regression Results*

Table 8 contains the baseline regression results explaining the firm performance as measured by Return on Assets using the unmatched sample. In the first column, we present the results of whether having an ex-bureaucrat improves firm performance. We find that the appointment of ex-bureaucrats increases firm performance relative to non-ex-bureaucrats in the regulated sector.

The second column presents the results of whether having ex-bureaucrats in regulated and non-regulated sectors improves firm performance. We find that the appointment of ex-bureaucrats in the regulated sector improves firm performance compared to non-ex-bureaucrats in the non-regulated sector. These results are in line with our argument that ex- bureaucrats provide the necessary intellectual and network capital to regulated firms, thus reducing the uncertainty regarding government policies, reducing costs to the firms, and improving firm performance.

In the third column, we present the results on whether having a women ex-bureaucrat compared to men ex-bureaucrat improves firm performance. We do not find any significant results implying the relationship between the gender of the ex-bureaucrat and the firm performance. The fourth column presents the results of whether having women ex-bureaucrats in the regulated sector improves firm performance compared to men ex-bureaucrats. The results show that the appointment of men ex-bureaucrats in the regulated sector compared to women Ex-bureaucrats is positive, but the result is not significant.

The baseline regression, however, might not accurately reflect the circumstances because of endogeneity problems that are mostly brought on by the firms' selection bias when recruiting former bureaucrats. Additionally, baseline regression might not provide a clear picture of determining causality. As a result, we use propensity score matching to address these concerns. We compare firm years with ex-bureaucrats with firm years without ex-bureaucrats while identically controlling for all other variables. We present the results of matched samples in Table 12 and 15.

Table 8.: Baseline Regression Results of ex-bureaucrats and firm performance

| | OLS Regressions | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Dependent Variable $ROA_{t+1}$ | | | | | | | |
| | (1) | | (2) | | (3) | | (4) | |
| Ex-B×REG | | | 1.59** | (0.01) | | | | |
| Ex-B | 1.13*** | (0.00) | 0.84* | (0.03) | | | | |
| Gender | | | | | -0.83 | (-1.26) | -1.41 | (-1.94) |
| Gender×REG | | | | | | | 1.51 | (1.13) |
| REG | | | -0.86* | (0.03) | | | 2.29 | (1.46) |
| ROA | 0.64*** | (0.00) | 0.64*** | (0.00) | 0.60*** | (11.49) | 0.61*** | (11.72) |
| RISK | -85.55*** | (0.00) | -85.52*** | (0.00) | -91.44** | (-2.82) | -93.27** | (-2.92) |
| SIZE | -0.33*** | (0.00) | -0.31** | (0.00) | -0.33 | (-1.82) | -0.48** | (-2.67) |
| LEV | -0.019 | (0.06) | -0.019 | (0.06) | -0.01 | (-1.91) | -0.01 | (-1.73) |
| MVBV | -0.00 | (0.89) | -0.00 | (0.88) | 0.24*** | (3.41) | 0.22** | (3.23) |
| PrOWN | 0.024*** | (0.00) | 0.03*** | (0.00) | 0.03 | (1.41) | 0.03 | (1.21) |
| bsize | 0.21*** | (0.00) | 0.21*** | (0.00) | 0.09 | (0.85) | 0.14 | (1.26) |
| %ind | -0.20 | (0.83) | -0.23 | (0.81) | -2.76 | (-0.88) | -1.87 | (-0.60) |
| %fem | 1.80 | (0.23) | 1.73 | (0.25) | -1.32 | (-0.26) | 0.67 | (0.14) |
| nciv | -0.24* | (0.01) | -0.22* | (0.02) | 0.16 | (0.80) | 0.01 | (0.03) |
| Standalone | -0.81** | (0.00) | -0.81** | (0.00) | 0.11 | (0.12) | -0.20 | (-0.23) |
| Foreign | 0.22 | (0.67) | 0.19 | (0.71) | -0.41 | (-0.19) | -0.89 | (-0.43) |
| _cons | 5.99*** | (0.00) | 5.95*** | (0.00) | 5.45 | (1.19) | 6.38 | (1.41) |
| Industry | Yes | Yes | Yes | Yes | Yes | Yes) | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $N$ | 6728 | | 6728 | | 419 | | 419 | |
| $R^2$ | 0.3373 | | 0.3377 | | | | 0.3368 | |

$p$-values in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

This table reports the results of OLS regressions for the relationship between ex-bureaucrat on board and firm performance. The dependent variable is Return on Assets (ROA). Independent variables include firm size (SIZE), percentage of independent directors (Ind), the standard deviation of stock returns (RISK), firm age (AGE), the debt-to-equity ratio (LEV), promoter ownership (PrOWN), a dummy variable for regulated (REG=1) or not(REG=0), company affiliation (aff). In addition, we control for industry-fixed effects (IND) and Year effects (YEAR), a dummy variable for Men Ex-bureaucrat(GENDER=1) or not.

### *4.4. Propensity Score Matching Results for Proposition 2*

We first estimate the propensity for the firm to receive the treatment of hiring an Ex-bureaucrat given covariates. Table 9 presents the results of the propensity score

matching. We find that firms in the regulated sector, large firms, firms with good ROA, firms already having ex-bureaucrats on the board, and standalone and foreign firms have more propensity to hire ex-bureaucrats.

Table 9.: Propensity Score Analysis (Ex-bureaucrats)

| Exb | Coef. | Std. Err. | z | P>z |
|---|---|---|---|---|
| REG | 0.44 | 0.12 | 3.85 | 0.00 |
| SIZE | 0.05 | 0.02 | 2.65 | 0.01 |
| LEV | 0.00 | 0.00 | 1.47 | 0.14 |
| ROA | 0.01 | 0.00 | 3.50 | 0.00 |
| RISK | 1.44 | 2.86 | 0.50 | 0.62 |
| MVBV | -0.01 | 0.01 | -1.20 | 0.23 |
| PrOWN | 0.00 | 0.00 | 0.51 | 0.61 |
| %ind | -0.21 | 0.24 | -0.86 | 0.39 |
| %fem | 0.70 | 0.35 | 2.03 | 0.04 |
| nciv | 0.31 | 0.02 | 13.41 | 0.00 |
| Standalone | -0.31 | 0.07 | -4.62 | 0.00 |
| Foreign | -0.30 | 0.14 | -2.22 | 0.03 |
| _cons | -1.45 | 0.40 | -3.67 | 0.00 |
| Year Effects | YES | | | |
| Industry Effects | YES | | | |
| Pseudo R2 | 11.37 | | | |

This table reports the results of logit regression for estimating the propensity to hire an ex-bureaucrat on the board. The dependent variable is a dummy variable for Ex-bureaucrat (Ex-B =1) or not. Independent variables include firm size (SIZE), percentage of independent directors (Ind), the standard deviation of volatility (RISK), firm age (AGE), the debt-to-equity ratio (LEV), promoter ownership (PrOWN), a dummy variable for regulated (REG=1) or not(REG=0), company affiliation (aff), firm return on assets (ROA). In addition, we control for industry-fixed effects (IND) and Year effects (YEAR).

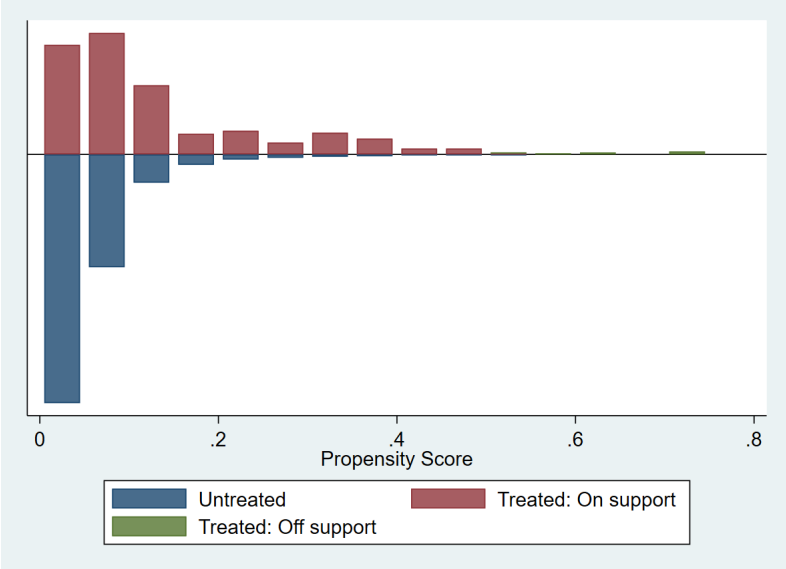
### *4.4.1. Balance diagnostics for propensity score matching*

After estimating the probability of hiring an ex-bureaucrat by a firm, we identify a treatment and control group based on kernel matching with the common support condition. We further check for the balance of covariates by looking at their density distribution before and after matching, propensity score balance plots, and standardized percentage bias reduction for covariates before and after matching as checking

the balance, overlap of common support region is an important step in matching especially in kernel matching as all untreated observations are used to create the missing counterfactual outcome (Caliendo and Kopeinig, 2008). We find that the propensity score distribution is well balanced between the treatment and control regions (Lechner, 2008) and we have observations in both the treatment and control for each set of pscore as shown in figure 2. Further, We find that the common support overlap region area is higher between the treatment and control groups after matching, as shown in figure 3.

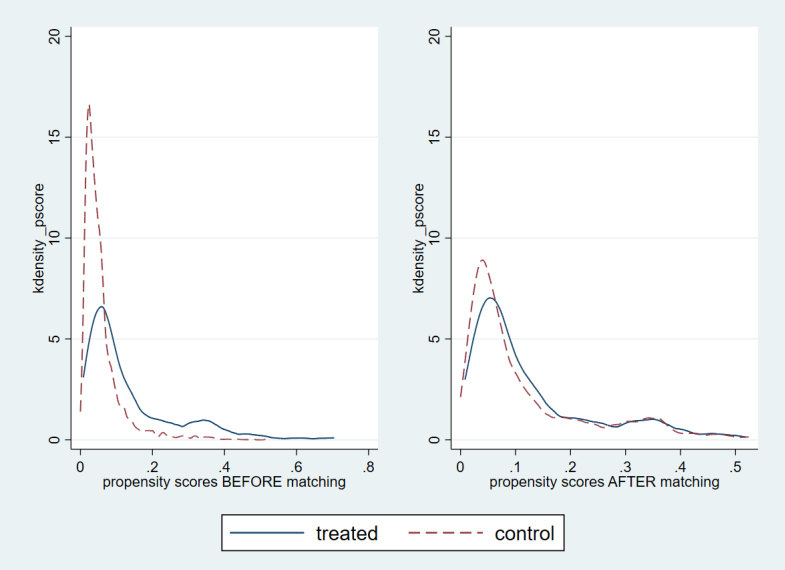
The figure 4 shows that the standardized percentage bias across covariates between the treatment and control group is reduced and is below 5% for most of the covariates except for risk, size, ROA, no of ex-bureaucrats in the board as shown in the table 10. However, the standardized percentage bias is below 10% for these variables. Further, the t-test shows no significant differences between the means of treated and control groups, as indicated in Table 10. Therefore, there is a balance of covariates between the treatment and the control group.

Figure 2.: Pscore balance



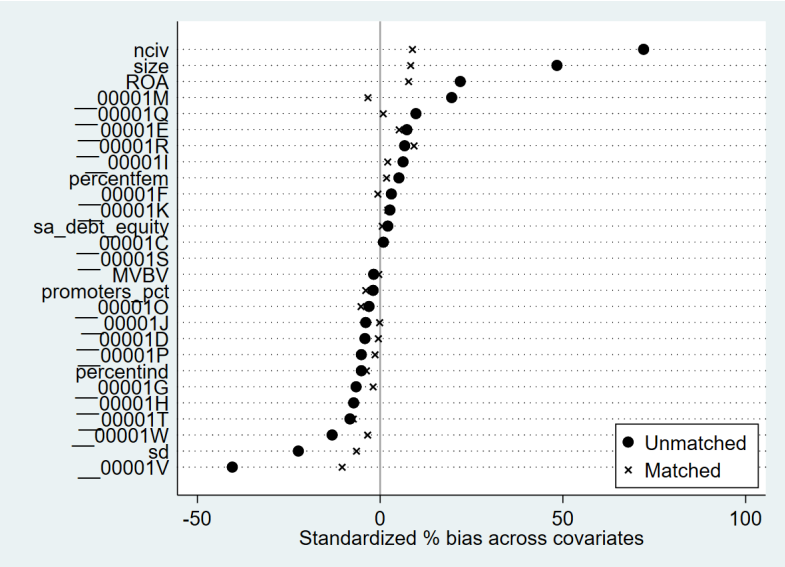

Histograms showing the density of propensity score distribution in the treated and control groups before and after matching.

Figure 3.: Distribution Plot




Density function showing the distribution balance of propensity score in the treated and control groups before and after matching.

Figure 4.: Standardized % bias across covariates




The standardized% bias across covariates before matching is represented by dots, while the bias after matching is represented by crosses. The standardised% bias is the ratio of the square root of the average variance in both groups divided by the percentage difference between the means in the treated (i.e., firms that recruited ex-bureaucrats) and control (i.e., firms that hired non-ex-bureaucrats) groups (Caliendo and Kopeinig, 2008). Crosses that are extremely near to 0 indicate that there is no discernible difference between the treatment group and the control group in any of the covariates.

Table 10.: Standardized percentage bias across covariates

| Variable | Unmatched(U) Matched (M) | Treated Mean | Control Mean | %bias | %reduction bias | t-test | p>t | V(T)/ V(C) |
|---|---|---|---|---|---|---|---|---|
| RISK | U | 0.029 | 0.031 | -22.4 | | -4.09 | 0.000 | 0.67* |
| | M | 0.029 | 0.029 | -6.5 | 70.9 | -0.97 | 0.332 | 0.77* |
| SIZE | U | 6.012 | 5.236 | 48.4 | | 9.56 | 0.000 | 0.99 |
| | M | 6.003 | 5.868 | 8.3 | 82.8 | 1.15 | 0.251 | 0.86 |
| LEV | U | 2.225 | 1.949 | 2.1 | | 0.47 | 0.640 | 1.65* |
| | M | 2.242 | 2.175 | 0.5 | 75.5 | 0.06 | 0.951 | 0.78* |
| MVBV | U | 2.954 | 4.066 | -1.8 | | -0.26 | 0.797 | 0.00* |
| | M | 2.941 | 3.196 | -0.4 | 77.0 | -0.11 | 0.911 | 0.01* |
| PrOWN | U | 53.902 | 54.197 | -1.9 | | -0.37 | 0.713 | 0.87 |
| | M | 53.881 | 54.492 | -4.0 | -107.8 | -0.57 | 0.570 | 0.86 |
| %ind | U | 0.509 | 0.515 | -5.1 | | -0.95 | 0.343 | 0.70* |
| | M | 0.509 | 0.514 | -3.8 | 26.2 | -0.57 | 0.571 | 0.82 |
| %fem | U | 0.091 | 0.086 | 5.1 | | 1.02 | 0.310 | 0.99 |
| | M | 0.091 | 0.089 | 1.7 | 66.7 | 0.25 | 0.805 | 1.05 |
| REG | U | 0.208 | 0.134 | 19.6 | | 4.21 | 0.000 | 0.00 |
| | M | 0.194 | 0.207 | -3.4 | 82.7 | -0.45 | 0.650 | 0.00 |
| $ROA_{t-1}$ | U | 5.615 | 3.915 | 21.9 | | 4.17 | 0.000 | 0.83* |
| | M | 5.594 | 4.993 | 7.7 | 64.7 | 1.09 | 0.274 | 0.80* |
| nciv | U | 1.224 | 0.378 | 72.1 | | 20.15 | 0.000 | 3.63* |
| | M | 1.155 | 1.052 | 8.8 | 87.8 | 1.07 | 0.286 | 0.97 |

The table shows the standardized % bias reduction after matching, t-test for difference between means of treatment and control variables and variance ratios to indicate the balance between covariates after matching.

### *4.4.2. Average treatment effect on the treated*

After matching, the average treatment effect on the treated is estimated. The estimate shows that the firm performance increases when an ex-bureaucrat is appointed in a regulated sector, and it is significant.

Table 11.: Average treatment effect of treated

| Variable | Sample | Treated | Controls | Difference | S.E. | t-stat |
|---|---|---|---|---|---|---|
| $ROA_{t+1}$ | Unmatched | 4.973 | 2.705 | 2.267 | 0.499 | 4.540 |
| | ATT | 4.933 | 3.388 | 1.545 | 0.436 | 3.550 |

*4.4.3. Double Robust Regression Results*

A double robust regression is performed on the matched sample to account for balance residual covariate imbalance. Table 12 contains the results of the multivariate regression on the matched sample to check for the causal relation between ex-bureaucrats appointment on the board and future firm performance. In the first column, we present the results that ex-bureaucrats appointment improves firm performance compared to non-ex-bureaucrats. The second column presents the results of whether having ex-bureaucrats in regulated and non-regulated sectors improves firm performance. We find that the appointment of ex-bureaucrats in the regulated sector improves firm performance compared to non-ex-bureaucrats in the non-regulated sector. These results align with our argument that ex- bureaucrats enhance firm performance in the regulated sector. Therefore, the double robust regression supports our proposition and shows that our results are not sensitive to outcome model specifications, establishing the robustness of the results.

### *4.5. Propensity Score Matching Results (Gender)*

We first estimate the propensity for the firm to receive the treatment of hiring an Male Ex-bureaucrat given covariates. Table 13 presents the results of the propensity score matching. We find that firms in regulated sector,have more propensity to hire men ex-bureaucrats compared to women ex-bureaucrats. We find that firms in the regulated sector have more propensity to hire Men ex-bureaucrats compared to women ex-bureaucrats, pointing towards the argument that men bureaucrats have superior policy connections due to their postings in influential positions. In contrast, women are generally given soft postings, which might result in fewer network connections.

Table 12.: Double Robust Regression Results

| | (1) $ROA_{t+1}$ | | (2) $ROA_{t+1}$ | |
|---|---|---|---|---|
| Ex-B×REG | | | 1.24** | (0.00) |
| REG | | | 1.27** | (0.00) |
| EX-B | 1.13*** | (0.00) | 0.84*** | (0.00) |
| ROA | 0.64*** | (0.00) | 0.61*** | (0.00) |
| RISK | -85.55*** | (0.00) | -112.86*** | (0.00) |
| SIZE | -0.33*** | (0.00) | -0.38*** | (0.00) |
| LEV | -0.02 | (0.06) | -0.01* | (0.02) |
| MVBV | -0.00 | (0.89) | 0.00 | (0.39) |
| PrOWN | 0.02*** | (0.00) | 0.03*** | (0.00) |
| %ind | -0.20 | (0.83) | -1.79* | (0.03) |
| %fem | 1.80 | (0.23) | -0.99 | (0.35) |
| bsize | 0.21*** | (0.00) | 0.09** | (0.00) |
| nciv | -0.24* | (0.01) | -0.02 | (0.78) |
| Standalone | -0.81** | (0.00) | -0.76*** | (0.00) |
| Foreign | 0.22 | (0.67) | -0.33 | (0.47) |
| Year | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes |
| _cons | 5.99*** | (0.00) | 8.17*** | (0.00) |
| $N$ | 6728 | | 6714 | |
| $R^2$ | 0.3373 | | 0.4088 | |

$p$-values in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

This table reports the results of OLS regressions for the relationship between ex-bureaucrat on board and firm performance on the matched sample with weights used for kernel matching. The dependent variable is Return on Assets (ROA). Independent variables include firm size (SIZE), percentage of independent directors (Ind), the standard deviation of volatality (RISK), firm age (AGE), the debt-to-equity ratio (LEV), promoter ownership (PrOWN), a dummy variable for regulated (REG=1) or not(REG=0), company affiliation (aff). In addition, we control for industry-fixed effects (IND) and Year effects (YEAR).

Table 13.: Propensity Score Matching(Gender)

| Gender | Coef. | Std. Err. | z | P>z |
|---|---|---|---|---|
| REG | 0.645 | 0.333 | 1.940 | 0.050 |
| $ROA_{t+1}$ | 0.003 | 0.014 | 0.200 | 0.840 |
| RISK | 11.073 | 10.762 | 1.030 | 0.300 |
| SIZE | -0.072 | 0.055 | 1.310 | 0.190 |
| LEV | 0.024 | 0.019 | 1.260 | 0.210 |
| MVBV | 0.043 | 0.030 | 1.420 | 0.150 |
| PrOWN | -0.004 | 0.006 | 0.700 | 0.480 |
| %ind | 0.777 | 0.867 | 0.900 | 0.370 |
| %fem | 1.109 | 1.012 | 1.100 | 0.270 |
| nciv | 0.087 | 0.067 | 1.300 | 0.190 |
| Business group | 0.008 | 0.224 | 0.030 | 0.970 |
| Foreign | -0.149 | 0.455 | 0.330 | 0.740 |
| _cons | 1.252 | 1.179 | 1.060 | 0.288 |
| Year | YES | | | |
| Industry | YES | | | |
| $N$ | 375 | | | |
| $PsuedoR^2$ | 0.1452 | | | |

$p$-values in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

This table reports the results of logit regression for estimating the propensity to hire a Men ex-bureaucrat on the board. The dependent variable is a dummy variable for Men Ex-bureaucrat (Gender=1) or not. Independent variables include firm size (SIZE), percentage of independent directors (Ind), the standard deviation of volatility (RISK), firm age (AGE), the debt-to-equity ratio (LEV), promoter ownership (PrOWN), a dummy variable for regulated (REG=1) or not(REG=0), company affiliation (aff), firm return on assets (ROA). In addition, we control for industry-fixed effects (IND) and Year effects (YEAR).

*4.5.1. Balance diagnostics for propensity score matching (Gender)*

After estimating the probability of hiring men ex-bureaucrats by a firm, we identify a treatment and control group based on kernel matching with common support conditions. We further check for the balance of covariates by looking at their density distribution before and after matching, propensity score balance plots, and standardized percentage bias reduction for covariates before and after matching as checking the balance, overlap of common support region is an essential step in matching especially in kernel matching as all untreated observations are used to create the missing counterfactual outcome (Caliendo and Kopeinig, 2008). We find that the propensity score distribution is well balanced between the treatment and control regions (Lechner, 2008) and we have observations in both the treatment and control for each set of pscore as shown in figure 5. Further, We find that the common support overlap region area is higher between the treatment and control groups after matching, as shown in figure 6.

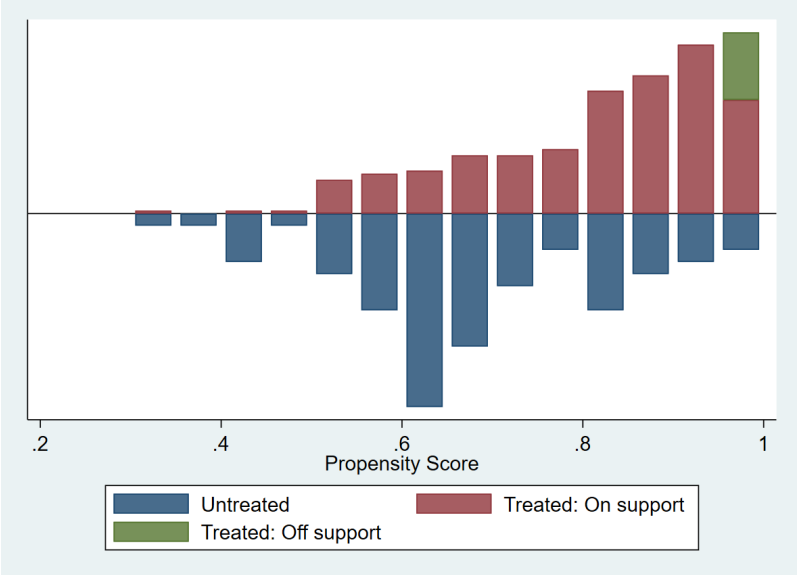



Figure 5.: Pscore balancing

Histograms showing the density of propensity score distribution in the treated and control groups before and after matching.

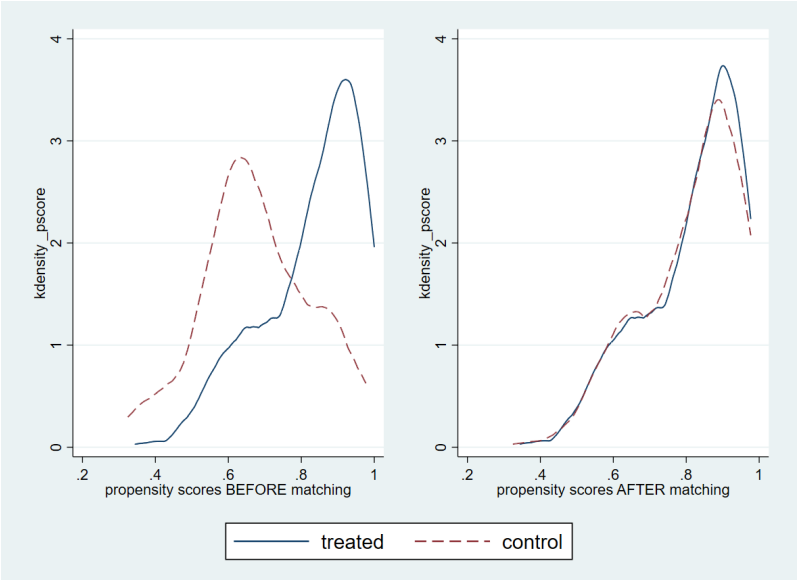



Figure 6.: Distribution Plot

Density function showing the distribution balance of propensity score in the treated and control groups before and after matching.

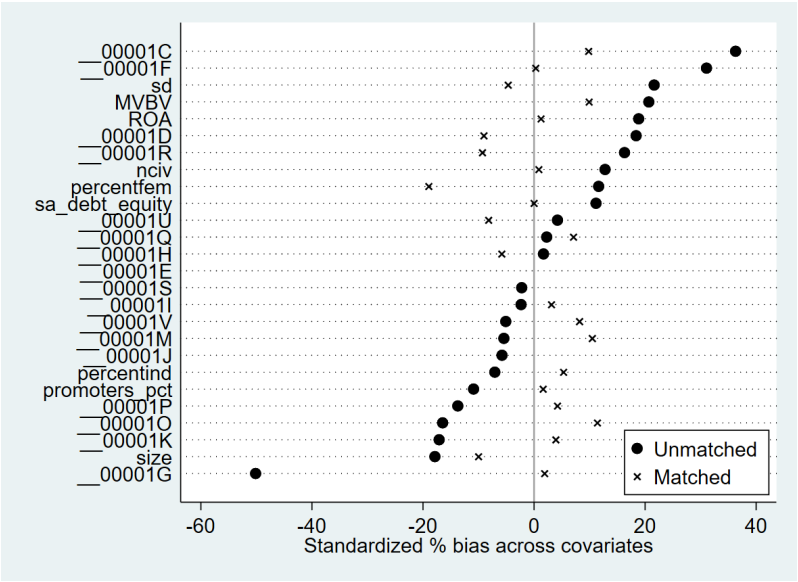



Figure 7.: Standardized % bias across covariates

The standardized% bias across covariates before matching is represented by dots, while the bias after matching is represented by crosses. Crosses that are extremely near to 0 indicate that there is no discernible difference between the treatment group and the control group in any of the covariates.

The figure 7 shows that the standardized percentage bias across covariates between the treatment and control group is reduced and is below 5% for most of the covariates and between 5- 10% for risk, size, MVBV,%ind except for %fem which is 20% as shown in the table 14. However, the t-test shows that there are no significant differences between the means of treated and control groups. Thus, there is a balance of covariates between the treatment and the control group.

Table 14.: Standardized percentage bias across covariates

| | Unmatched | Mean | | | %reduction | t-test | | V(T)/ |
|---|---|---|---|---|---|---|---|---|
| Variable | Matched | Treated | Control | %bias | bias | | p>t | V(C) |
| RISK | U | 0.029 | 0.028 | 21.600 | | 1.590 | 0.113 | 1.530* |
| | M | 0.029 | 0.029 | -4.700 | 78.400 | -0.520 | 0.605 | 1.180 |
| SIZE | U | 5.944 | 6.239 | -17.900 | | -1.420 | 0.156 | 0.860 |
| | M | 5.958 | 6.123 | -10.000 | 43.900 | -1.160 | 0.246 | 0.870 |
| LEV | U | 2.692 | 1.309 | 11.200 | | 0.690 | 0.488 | 40.220* |
| | M | 1.607 | 1.609 | 0.000 | 99.800 | -0.010 | 0.995 | 3.550* |
| MVBV | U | 3.109 | 2.407 | 20.700 | | 1.460 | 0.146 | 2.180* |
| | M | 2.854 | 2.518 | 9.900 | 52.100 | 1.160 | 0.248 | 1.180 |
| PrOWN | U | 53.803 | 55.453 | -10.900 | | -0.860 | 0.388 | 0.880 |
| | M | 53.807 | 53.562 | 1.600 | 85.200 | 0.190 | 0.850 | 0.860 |
| %ind | U | 0.511 | 0.518 | -7.100 | | -0.580 | 0.563 | 0.720* |
| | M | 0.511 | 0.506 | 5.300 | 25.000 | 0.680 | 0.500 | 1.010 |
| %fem | U | 0.094 | 0.083 | 11.600 | | 0.940 | 0.349 | 0.800 |
| | M | 0.095 | 0.113 | -19.000 | -63.100 | -1.970 | 0.050 | 0.510* |
| REG | U | 0.214 | 0.237 | -5.400 | | -0.430 | 0.669 | . |
| | M | 0.206 | 0.162 | 10.500 | -92.600 | 1.330 | 0.183 | . |
| business group | U | 0.187 | 0.171 | 4.200 | | 0.330 | 0.745 | . |
| | M | 0.191 | 0.223 | -8.200 | -94.500 | -0.920 | 0.360 | . |
| foreign | U | 0.030 | 0.039 | -5.100 | | -0.410 | 0.679 | . |
| | M | 0.032 | 0.017 | 8.200 | -60.400 | 1.130 | 0.258 | . |
| ROA | U | 5.755 | 4.410 | 18.800 | | 1.390 | 0.165 | 1.470* |
| | M | 5.713 | 5.625 | 1.200 | 93.500 | 0.130 | 0.894 | 1.020 |
| nciv | U | 1.174 | 1.000 | 12.800 | | 0.950 | 0.344 | 1.430* |
| | M | 1.148 | 1.137 | 0.800 | 93.400 | 0.100 | 0.923 | 1.270 |

The table shows the standardized % bias reduction after matching, t-test for difference between means of treatment and control variables and variance ratios to indicate the balance between covariates after matching.

*4.5.2. Double Robust Regression Results*

A double robust regression is performed on the matched sample to account for balance residual covariate imbalance. Table 15 contains the results of the multivariate regression on the matched sample to check for the causal relation between Men ex-bureaucrats appointment on the board and future firm performance. In the first column, we present that the appointment of Men ex-bureaucrats reduces firm performance compared to Women ex-bureaucrats. The second column presents the results of whether having Men ex-bureaucrats in regulated and non-regulated sectors improves firm performance. We find that the appointment of Men ex-bureaucrats in the regulated sector improves firm performance compared to Women ex-bureaucrats in the non-regulated sector.

Table 15.: Double Robust Regression Results

| | (1) $ROA_{t+1}$ | | (2) $ROA_{t+1}$ | |
|---|---|---|---|---|
| Gender×REG | | | 3.26* | (0.04) |
| Gender | -2.08*** | (0.00) | -2.69*** | (0.00) |
| REG | | | -0.87 | (0.54) |
| ROA | 0.63*** | (0.00) | 0.64*** | (0.00) |
| RISK | -60.29 | (0.09) | -58.89 | (0.10) |
| SIZE | -0.33 | (0.12) | -0.43* | (0.05) |
| LEV | -0.08 | (0.18) | -0.07 | (0.21) |
| MVBV | 0.21* | (0.04) | 0.20* | (0.04) |
| PrOWN | 0.01 | (0.62) | 0.01 | (0.63) |
| %ind | -7.46* | (0.02) | -6.45* | (0.05) |
| %fem | -0.37 | (0.91) | -0.45 | (0.89) |
| bsize | 0.10 | (0.41) | 0.11 | (0.36) |
| nciv | 0.37 | (0.12) | 0.25 | (0.29) |
| Year | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes |
| Standalone | -0.99 | (0.21) | -1.046 | (0.19) |
| Foreign | -0.64 | (0.73) | -0.92 | (0.62) |
| _cons | 10.85* | (0.02) | 11.04* | (0.02) |
| $N$ | 353 | | 353 | |
| $R^2$ | 0.5813 | | 0.5875 | |

$p$-values in parentheses
* $p < 0.05$, ** $p < 0.01$,*** $p < 0.001$

This table reports the results of OLS regressions for the relationship between Men ex-bureaucrat on board and firm performance on the matched sample with weights used for kernel matching. The dependent variable is Return on Assets (ROA). Independent variables include firm size (SIZE), percentage of independent directors (Ind), the standard deviation of volatality (RISK), firm age (AGE), the debt-to-equity ratio (LEV), promoter ownership (PrOWN), a dummy variable for regulated (REG=1) or not(REG=0), company affiliation (aff). In addition, we control for industry-fixed effects (IND) and Year effects (YEAR), a dummy variable for Men Ex-bureaucrat(Gender=1) or not.

## 5. Robustness Checks

### *5.1. Difference-in-Difference*

We employ a difference-in-differences (DID) analysis around ex-bureaucrat appointments to identify the effect of appointing ex-bureaucrats on board to firm value to account for endogeneity. We compare the treatment group, i.e., firms with an ex-bureaucrat appointment, to firms with non-ex bureaucrat appointments. The sample is pruned by eliminating firms with multiple ex-bureaucrat and non-ex-bureaucrat appointments. Also, firms with ex-bureaucrat and non-ex-bureaucrat appointments in the same year are eliminated. We ended up with a sample size of 41 treated and 1154 control. We then match treatment and control observations using kernel matching not to lose additional sample size, as the control size is greater than the treated. We end up with 46 pairs of matching. We observe whether there is any statistical difference between treated and control univariate comparisons.

We find that the Diff-in-diff estimate is significant as shown in table 16, establishing the robustness of our results.

Table 16.: DiD (Ex-B)

| | (1)<br>Post |
|---|---|
| post | -0.0305 |
| | (-0.06) |
| Ex-bureaucrat | 2.442*** |
| | (5.09) |
| Diff-in-diff | 1.735* |
| | (2.48) |
| Constant | 3.902*** |
| | (11.21) |
| Observations | 2014 |

$t$ statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

## 6. Conclusion and Way forward

This study finds that investors react negatively to the appointment of ex- bureaucrats on the board of both regulated and non-regulated firms. However, when we further divide the appointment based on gender, we find that investors perceive the appointment of women ex-bureaucrats to be a value-reducing event, especially in the case of the regulated sector. Further, the appointment of men ex-bureaucrats in the regulated sector is an insignificant event. This shows that investors might believe that adding an ex-bureaucrat to the board might result in their rent extraction, thus affecting the firm's future performance.

Contrary to the investors' view, we find that appointing ex-bureaucrats on the board of regulated firms results in an improvement in firm performance compared to appointing ex-bureaucrats on the board of non-regulated firms. This result is established through the propensity score matching technique that accounts for inherent endogeneity prevalent in the selection of board members to the board of a firm. Further, we find that appointing men ex-bureaucrats on the board of the regulated sector improves the firm's performance compared to the appointment of women ex-bureaucrats. This finding is interesting, and the plausible reason lies in the bias in the Indian bureaucrats' postings based on gender, thus resulting in less social capital for women ex-bureaucrats. However, researchers can further study the causes of this interesting finding to understand the phenomenon.

We plan to perform robustness checks for proposition 4. We also plan to examine staggered DiD as robustness checks for proposition 2 and 4. We will also examine the literature to understand the causes behind our results, which are counter-intuitive to our proposed propositions.

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