Listed Zombie Firms and Top Executive Gender:

Evidence from an Emerging Market

Abstract

This paper examines the implication of top executive gender on the zombie likelihood of firms listed in China's stock market. Our investigation shows that an increase in female executive percentage can significantly reduce corporate risk and zombie likelihood. This reduction in zombie likelihood is mainly achieved by the financial supervision of the female CFOs, mainly through the channels of quality improvement in information disclosure as well as in corporate governance. By contrast, loans and subsidies from local governments and financial institutions do not improve the performance of listed companies but increase zombie likelihood. Female executives' previous appointments with government agencies and financial institutions increase zombie likelihood as well. The academic background of female executives does not affect zombie likelihood. These findings provide insights into the relationship between executive gender diversity and corporate governance. We provide policy recommendations to help address the issue of zombie firms in China.

Keywords: Executive gender, Zombie firms, Corporate governance, China
JEL classification: J16; G30; G34

1. Introduction

The late 2000s global financial crisis underlines the importance of systemic risk (Giesecke and Kim, 2011; Billio et al., 2012; Acemoglu et al., 2015; Adrian and Brunnermeier, 2016; Brownlees and Engle, 2016; Giglio et al., 2016; Acharya et al., 2017). A large amount of zombie firms increases the level of systemic financial risk in China and becomes an increasingly important issue on the agenda of the Chinese government (Tan et al., 2016). The inefficient production capacity of zombie firms might have long-term devastating effects, particularly in times of economic downturn, as the misallocation of financial resources in terms of government subsidies and bank loans flowing into zombies exerts a crowding-out effect on firms of high production efficiency and proper management (Caballero et al., 2008). Therefore, how to alleviate the risk of zombie firms is of essential importance for both policymakers and academia, which is the aim of our study.

The analysis of the Chinese zombie firms in the existing literature indicates three leading causes. First, the 1994 fiscal decentralization reform has led to vicious competition between local governments in China. A consequence of this intergovernmental competition turns out to be market-distorting subsidies to local firms, particularly state-owned ones. Second, the collusion between local governments and local businesses has further driven zombie firms. Poorly-managed local firms in China might continue to receive strong governmental support if they were initially established as "*showcase projects*" for local economies, or local governments consider them as essential for local economic prosperity and social stability in terms of fiscal revenue

and job opportunities. Third, discrimination against non-state companies in the allocation of bank loans is another cause of zombie firms (Moudud-Ul-Huq, 2019). For a long time, China's banking sector has tended to treat state-owned firms favorably, even if these state-owned firms have become insolvent because Chinese banks consider loans to state firms less risky on the expectation of endorsements from governments at all levels (Song and Xiong, 2018).

The extant literature has only covered the external forces of local government policies and financial institutions, as described above, but not enough regarding internal corporate governance. Female executives, for instance, as an essential part of the corporate governance structure, make essential decisions in investment, mergers, and acquisitions, and risk-taking, have attracted much attention. In China, although companies with female CEOs only account for 5% of all Chinese listed companies, female executives play an increasingly significant role in corporate decision-making.

As many studies suggest that female executives can reduce corporate risk, the issue of gender diversity in the board of directors has received considerable attention from global regulators. Over the past decade, companies in various countries have been subject to increasing regulatory pressures to address the problem of female underrepresentation within the board of directors. Countries such as Norway, France, Italy, and India have imposed mandatory requirements of gender diversity within corporate boards. On the other hand, countries such as the UK and Spain have adopted a "*soft*" regulatory approach that encourages growth in the proportion of female members within the board (De Cabo et al., 2019). Due to the lack of relevant gender

diversity regulations on listed companies in China, we investigate whether female executives can improve corporate governance and reduce zombie probability.

We focus on the gender diversity of corporate boards and the attributes of female executives (education and experience), which are essential characteristics of internal corporate governance. We intend to provide new insights into the role of female executives in the zombie firms in China. Female executives may affect the internal corporate governance of listed companies through two channels. First, most studies have found that female executives tend to be more risk-averse than their male counterparts. Companies doing well in the gender diversity of corporate governance might reduce zombie likelihood as female executives tend to choose low-risk projects and to make a prompt response to projects of negative returns. Second, female executives are more likely to comply with regulations by disclosing high-quality financial information. Hence, in general, we expect a negative empirical relationship between the gender diversity of corporate governance and the zombie likelihood.

Using a unique Chinese data set, we have built an unbalanced panel that includes more than 3,500 listed companies in China and covers 22 years (1997-2018). We define zombie firms as financially indebted and insolvent ones that remain in operation. We follow Caballero et al. (2008) to construct a dummy variable to indicate whether a firm is a zombie. Specifically, we use "*minimum required interest payment*" to determine the cost of non-market credits and identify as zombies those companies with actual interest payment below the minimum required an interest payment for two consecutive years. As female executives at different positions within the same firm (i.e., board chair, CEO,

and CFO) might influence the zombie likelihood of the firm through various channels, we examined the impacts of three types of top executive positions, namely board chair, CEO, and CFO, on the zombie likelihood, respectively.

After controlling for individual and time fixed effects, with 1% growth of female executives, the zombie likelihood falls by about 3.5%. For robustness, we examine the average firm-level female executive percentage across different industries and obtain qualitatively similar findings. For every 1% growth in female CFOs percentage, zombie likelihood decreases by 2.2%. By contrast, for every 1% increase in female CEOs percentage, zombie percentage increases by 3.1%. Besides, female executives holding both CEO and CFO positions have an insignificant impact on zombie likelihood. Overall, we suggest that the positive impact of female executives on company performance works mainly through the channel of financial supervision by female CFOs, rather than the general management by female CEOs. As for the impact of corporate executives' professional background, our empirical results show that an increase in the number of executives with financial backgrounds can reduce the zombie likelihood. However, the rise in the proportion of female executives with financial backgrounds has an insignificant impact. Besides, we examine the impact of the political background of female executives and show that female executives' political experience is positively associated with zombie likelihood.

The rest of the paper is structured as follows. Section 2 reviews the relevant literature. Section 3 presents data sources, descriptive statistics, as well as the research method. Section 4 presents the empirical results. Section 5 concludes and provides

policy recommendations.

2. Literature Review

We review the relevant literature and identify the literature gap in this section.

2.1 Gender Diversity and Corporate Governance

Numerous studies have shown the benefits of gender diversity for corporate governance. First, gender diversity improves board supervision, the quality of information disclosure, and communication efficiency (Nielsen and Huse, 2010; Perrault, 2015; Kim and Starks, 2016). Second, female board members tend to pay more attention to stakeholders. Stakeholders include not only shareholders but also customers, suppliers, employees, and even the general public (Finegold et al., 2007). Besides, female directors improve a company's reputation/image as they are more sensitive to social and environmental issues (Bear et al., 2010).

Zahra and Pearce (1989) explain the benefits of gender diversity from a resource dependence perspective, as they consider female board directors as an essential source of human and social resources (Hillman and Dalziel, 2003). The unique business sense of female board members helps the board gain more insight into consumer purchasing patterns and better connect with female board members of other companies to end up with better decisions (Süssmuth-Dyckerhoff et al., 2012). Others believe that heterogeneous groups help companies achieve more innovations and better decisions as heterogeneity tends to create a broader knowledge base and a more comprehensive perspective and to obtain the complementarity between skills and critical thinking

(Miller and Del Carmen Triana, 2009).

A large body of literature indicates that men are more risk-taking than women. *Ceteris paribus*, a company's risk level, tends to be smaller with a female CEO than a male CEO. A strand of literature (e.g., Almenberg and Dreber, 2015; Low et al., 2015) examines the gender-related difference in firm behavior. They found that male managers are more willing to invest in risky assets, with higher transaction frequency and turnover rates. By contrast, female managers are more willing to choose assets with stable returns. To explain this difference, some researchers point to a wide range of cultural mechanisms, such as income disparities and biological mechanisms (Dwyer et al., 2003; Faccio et al., 2016). Watson and Robinson (2003) argue that male-controlled SMEs have higher profits and higher risks.

2.2 Gender Diversity and Firm Performance

The existing literature has shown that gender diversity on corporate boards can improve firm performance and increase shareholder returns over a long period. Liu et al. (2014) and Christiansen et al. (2016) use Tobin Q as a measure to investigate listed companies and find those female executives enhance the quality of corporate decision-making. However, Jiang et al. (2016) argue that the impact of gender diversity on firm performance depends on the industry context of the firm. Female managers may have a skill advantage in the marketing of packaged consumer goods.

Robb and Watson (2012) argue that even after controlling for variables such as industry context, business age, and business size, women-controlled SMEs still perform poorly, and this poor performance tends to continue. Other researchers believe that

women have a better balance between career and family life (Barigozzi et al., 2018). Torchia et al. (2011) argue that in patriarchal societies such as India, female directors might be symbolic in order to meet the legislative requirements of female director percentage. Therefore, the positive impact of female directors on the firm performance can be found only for firms with the percentage of female directors above certain levels (Liu et al., 2014; Owen and Temesvary, 2018). However, Chapple and Humphrey (2014) argue that there is no clear relationship between gender diversity and firm performance.

The existing analysis of the causes of zombie firms is mainly focused on macro factors including bank credit discrimination based on firm ownership (Anzoategui et al., 2015), capital ratio requirements of banks (Peek and Rosengren, 2005), local protectionism by local government for employment and social stability, and vicious competition among local governments (Shen and Chen, 2017). Only a few papers explored the impact of micro factors such as business efficiency, scale, product quality, technological innovation capabilities, and entrepreneurship on zombie firms (Adalet McGowan et al., 2017; Lewis and Gasealahwe, 2017).

2.3 Literature Gap

Most of the existing studies are based on data from developed countries such as the United States. Few empirical studies examine the connection between gender diversity and the performance of listed companies in developing countries. The study of the influence of female executives on listed zombie firms in China is even rare. Given that local governments play an essential role in the Chinese zombie firms, we attempt to answer the following problems: (1) Is the impact of Chinese female executives only

symbolic? (2) Does the participation of females in the board of directors in Chinese companies reduce zombie likelihood? (3) How the impact of female executives varies across different executive positions such as board chair, CEO versus CFO? (4) What is the impact of female executives with the previous appointment in government agencies and financial institutions on the likelihood of zombie firms?

3. Data and Methodology

In this section, we justify our choices of variables, describe the data and sample, as well as methodology.

3.1 Variable Justification

Research on the behavior of zombie firms has been mainly concentrated on corporate governance and executive backgrounds. Firm size ownership, debt ratio, board composition, and the previous experience of executives are all shown to have impacts on zombie firms. For example, the motives of the executives of state-owned firms in China include substantial expansion in firm size for more favorable support from local governments and banks, a position of "*too big to fail*" and promotion in their political careers. The local government in China tends to intervene in the local economy. For example, the government might support an insolvent state-owned firm by writing off the bad debts. Moreover, the soft budget constraint of the local government further encourages the high-risk expansion by state firms. Besides, executives of state-owned firms have a strong and close bond with the local government as the government appoints them. Meanwhile, banks in China tend to cooperate with the local government

because they are subject to government supervision. All these factors contribute to a local community of the government, state firms, and banks with a shared interest.

As female executives are considered to contribute to better corporate governance, they are expected to reduce zombie likelihood. According to the upper echelons theory, organizational strategy and performance can be explained by executives' background characteristics such as gender and education. The influence of female executives on corporate decision-making stems from their gender-specific skills. Many studies have proven that female executives can effectively improve corporate governance. Adams and Ferreira (2009) show that female directors can improve board behavior and strengthen board supervision. Furthermore, female executives can improve accounting conservatism, curb financial fraud risks, and improve the quality of information disclosure (Li and Zeng, 2019). Given the role of female executives in improving corporate governance and reducing corporate risk, the relationship between female executives and zombie likelihood is worth further study.

3.2 Data

Our firm data are obtained from the China Stock Market & Accounting Research (CSMAR) database, which covers the information required by regulations to disclose by listed companies in China, namely financial statements and executive backgrounds. We constructed an unbalanced panel that includes 3,500 listed Chinese companies for 22 years (1997-2018). Although the Chinese stock market has been established in the early 1990s, there are no top female executives until 1997.

The descriptive statistics show that Chinese listed companies generally obtain debt

at low costs (Table 1). 21% of the sample companies have borrowed at an interest rate of 10% or more below the benchmark for two consecutive years. Among the sample companies, the female executive percentage is about 6%. The female executive rate at the industrial level varies across different industries between 0% and 40%. 22% of the chief financial officers (CFO), 5.0% of the chief executive officers (CEO), and 5.3% of the board chairs are women.

In our sample, the percentage of shares held by the state is 24%, the percentage of shares held by executives combined is 16%, and the percentage of foreign shareholding is only 2%. In terms of professional experience, the average percentage of executives with financial experience is about 24% (4.9), of which 17% are women (1.2). Table 1 also presents information about the previous political experience. The possible appointment ranks include from high to low national, provincial, prefectural, county and township levels. These levels are assigned numerical values between 1 and 18, and any levels lower than the township level are assigned 98 or 99. Levels of the institutions that previous political appointments are affiliated to are assigned numerical values in a way similar to the political experience. Institutional levels, from state to local levels, are assigned numerical values between 1 and 12, and any levels below township one are assigned 98 or 99. According to the median value, few executives have previous political experience. Moreover, female executives are lower than their male counterparts in terms of political experience as well as the levels of associated affiliations.

[Insert Table 1 around here]

In Figures 1, we plotted the number and the percentage of female executives per year. It shows an upward trend in both the total number and the percentage of female executives.

[Insert Figures 1 around here]

3.3 Methodology

As mentioned, we define zombie firms as financially indebted and insolvent ones that remain in operation. We use "*minimum required interest payment*" to determine the cost of non-market credits and identify as zombies those companies with actual interest payment below the minimum required an interest payment for two consecutive years. If a firm is identified as a zombie one, it is assigned a value of 1. Otherwise, it is 0. We use the Caballero et al. (2008) method to identify whether a firm is a zombie. The process is divided into three steps:

Step 1: Calculate the minimum required interest payment ($R_{i,t}^{*}$); the calculation formula is as follows:

$$R_{i,t}^{*} = rs_{t-1}BS_{i,t-1} + \left(\frac{1}{5}\sum_{j=1}^{5} rl_{t-j}\right)BL_{i,t-1} + rcb_{\min overlast5years,t}Bonds_{i,t-1} \quad (1)$$

Among them, rs_{t-1} and rl_{t-j} represent the average short-term preferential interest rate and the average long-term preferential interest rate for the t-1 year. $rcb_{\min overlast5years,t}$ indicates the lowest value for the coupon rate of convertible bonds from t-5 years to t-1 years. $BS_{i,t-1}$, $BL_{i,t-1}$ and $Bonds_{i,t-1}$ respectively represent the short-term bank loans, long-term bank loans, and issued bonds of the company *i* in year *t-1*. Step 2: According to the company's financial report, obtain the total actual interest-payment

$R_{i,t}$ by the firm in the t-year. Step 3, calculate:

$$x_{i,t} = \frac{R_{i,t} - R_{i,t}^{*}}{B_{i,t}} \quad (2)$$

Among them, $B_{i,t-1} = BS_{i,t-1} + BL_{i,t-1} + Bonds_{i,t-1} + CP_{i,t-1}$. $CP_{i,t-1}$ is the number of commercial papers in the company's t-1 year. If it is less than 0, it means that the company has obtained the loan subsidy provided by the bank and is recognized as a zombie firm. Company executives in this paper include board chairs, CEOs, general managers, deputy general managers, and CFOs.

Based on the above analysis, we adopt the following regression model (Liu et al., 2014):

$$\begin{aligned} Zombie\ Firm\ Prob &= \gamma Board\_Gender\_Diversity_{it} + \beta Board\_Char_{it} \\ &+ \delta Ownership\_Char_{it} + \phi Firm\_Char_{it} + \theta Executive\_Background + \alpha_i + \mu_t + \varepsilon_{it} \end{aligned} \quad (3)$$

Zombie Firm Prob represents whether it is identified as a zombie firm. $Board\_Gender\_Diversity$ represents the percentage of female executives. And $Board\_Char$, $Ownership\_Char$, $Firm\_Char$ represent board characteristics, ownership characteristics, and firm characteristics, respectively. $Executive\_Background$ represents the professional background of the executives.

We constructed an unbalanced panel that includes 3,500 listed Chinese companies for 22 years (1997-2018). Since the dependent variable is a 0-1, we use a linear probability model for regression. We control for firm-level debt ratio, total assets, operating income, financial costs, net profit, as well as firm fixed effects and time effect. To correct for possible heteroscedasticity, we used robust standard errors in all regressions.

There is an endogeneity issue as better performed firms may attract more females to join the board. To address this issue, we estimate the regression model by a PSM (propensity score matching), a high-dimensional fixed effects model, and (3) a difference-in-difference analysis framework.

4. Empirical Results: Female Executives and Zombie Firms

We present our empirical results in this section.

4.1 Executive Gender Diversity and Zombie Likelihood

We first examine whether the percentage of female executives has a considerable impact on zombie likelihood. Table 2 shows that the percentage of zombie firms measures the results from equation (1), where executive gender diversity is measured by the percentage of female executives and zombie likelihood. The columns (1)-(4) in Table 2 represent the results of the five control variables, respectively.

[Insert Table 2 around here]

Table 2 shows that the proportion of female executives reduces zombie likelihood. For example, columns (1)-(4) show that for every 1% increase in female executives, the proportion of zombie firms will fall by -3.5%, -3.4%, -3.4%, and -3.3%, respectively.

Regarding the impact of different ownership characteristics on the zombie likelihood, Table 2 shows that the higher the percentage of state shareholding, the higher the zombie likelihood. This evidence suggests that to support the development of local firms, local governments usually give more loans and subsidies to state-owned

companies than non-state ones, resulting in more zombie firms. This misallocation of financial resources tends to lower the efficiency level of the overall economy. Also, the higher the proportion of foreign capital, the lower the zombie likelihood is. This finding is because foreign capital tends to be more advanced in technology and management, facing intense market competition. Foreign capital tends to be driven out of the market if they do not adapt.

Moreover, the higher the percentage of shares held by executives, the more likely it is to become zombie firms. This result implies significant agency problems with Chinese listed companies. Executives tend to be more concerned about company size rather than profit as executive compensation grows with company size. Even if the companies lose money for a long time, they might still receive local government funds and policy support to remain in the market for a long time. The size of assets and the financing costs are shown to increase with zombie likelihood.

4.2 Female CEO and CFO

A chief financial officer (CFO) may influence the company's performance through financial supervision. By contrast, the chief executive officer (CEO) mainly affects the company's performance through general management. Therefore, we examine the impacts of female executives at different positions on zombie likelihood separately. We first divided female executives into four groups: female CFO, female Chair, female CEO, and female executives holding both CEO and CFO concurrently. Then, we replaced the female executive percentage in the regression model (1) with variables of female CFO, female Chair, female CEO, and female CEO+CFO to examine the impact

of gender diversity on company performance. The results are shown in Table 3. Table 3 shows that a 1% rise of female CFOs reduces zombie likelihood by 2.1%. However, a 1% rise of female CEOs increases zombie likelihood by 3.1%. Female Chair and females holding CEO and CFO currently have an insignificant impact on zombie likelihood. Overall, our research implies that the positive impact of female executives on company performance is mainly through the channel of CFO financial supervision, rather than the channel of CEO general management.

[Insert Table 3 around here]

4.3 Propensity Score Matching Estimates

If the impact of executive gender on zombie likelihood depends on firm characteristics, then the negative correlation between female executives and zombies is not driven by executive gender. Hence, for the results in Table 3 that examines the impact of female executives on zombie likelihood, the regression coefficients may be biased due to potential explanatory variables. To mitigate this estimation bias, we used PSM (propensity score matching) to estimate the treatment effect of executive gender on zombie likelihood. We take as the treatment group, the firms where females succeeded males as the executive, and as the control group, the firms where males succeeded males. By matching, we obtained two sets of samples with no observable differences in firm characteristics. Hence, executive gender can be considered as the vital difference between the treatment group and the control one. PSM helps solve the problem of non-random mutual selection and improves causality in the empirical analysis.

We first estimate the probability model to calculate the propensity score for firms

run by female executives. Column (1) of Table 4 shows that compared with firms of male CFOs, female CFO companies have higher financing costs, but zombie likelihood has a smaller impact. However, column (2) of Table 4 shows that there is no significant difference in zombie likelihood between firms run by female CEOs and by male CEOs.

[Insert Table 4 around here]

4.4 High-dimensional Fixed-effects

To alleviate the potential endogeneity caused by the unobserved cross-firm heterogeneity as well as cross-industry time-varying heterogeneity, we follow the approach by Gormley and Matsa (2014) to control for the interaction between the industry fixed effect and the year fixed effect. The results in Table 5 are consistent with the ones in Table 3. The estimated coefficient of Female CFOs is negative and significant at the conventional 5% level. The significance level of the coefficients of the chairman, CEO, CEO+CFO has not qualitatively changed, which suggests that our results are robust.

[Insert Table 5 around here]

4.5 Female Executives' Financial Background

To further examine the impact of the financial experience of female executives on company performance. We examine the impact of the number of female executives and the percentage with financial experience on zombie likelihood. We re-run model (1) with the gender diversity replaced by four variables, namely the percentage of executives with a financial background, the percentage of female executives with a

financial background, the number of executives with a financial background, and the number of female executives with financial background. The results, shown in Table 6, indicate that the increase in the number of male and female executives with financial experience can reduce zombie likelihood compared to executives without financial experience. Zombie likelihood declines with the percentage of executives with financial experience. However, the estimated coefficient of female executives with financial experience is statistically insignificant.

[Insert Table 6 around here]

As a robustness test, we examined the impact of the industry average of female executives on zombie likelihood. The results shown in Table 7 are roughly similar to those in Table 6. We find that an increase in the number of executives with financial experience helps to reduce zombie likelihood. A rise in the percentage of executives with financial experience also helps to reduce zombie likelihood. Meanwhile, the impact of a rise in the proportion of female executives with financial experience turns out to be not significant.

[Insert Table 7 around here]

4.6 Previous Appointments and Personal Backgrounds

After the implementation of fiscal decentralization reform in 1994, Chinese local governments have a strong desire to develop the local economy to maintain fiscal balance. Government subsidies, particularly those large-scale ones to state-owned firms, have caused the zombies, many money-losing companies remaining in the market. Therefore, an examination of the previous appointments in government agencies of

executives reveals the role that political power plays in the formation of zombie firms in China.

For executives' previous appointments in a government agency, we consider two variables. One is the appointment level. The higher the appointment level is, the lower the value assigned is. The other is the level of the government agency that executives were previously appointed to serve. The higher the level of the government agency is, the lower the value assigned is. For executives' previous appointments in financial institutions, we only consider the regulatory power of the financial institution. Values are assigned to various financial institutions from low to high by order of regulatory power (namely, regulatory agency, policy banks, commercial banks, and the rest).

The results in Table 8 show that the level of executives' previous political appointments contributes to zombie likelihood. The level of the financial institution that a female executive was previously appointed to serve is also positively related to zombie likelihood. Experience with financial intuitions is positively related to zombie likelihood for both male and female executives. However, the educational background is not significantly related to zombie likelihood for both male and female executives.

These results indicate that executives' experience with government agencies and financial institutions are positively related to zombie likelihood for listed companies in China. Executives' previous affiliation with political power and financial resources make it easier for the company to obtain loans and subsidies from local governments and banks. On the other hand, local governments, for the sake of maintaining social stability and employment rate, would help inefficient state-owned firms remaining on

the market instead of letting them go bankrupt. These all contribute to the emergence of many inefficient companies on the market and inefficient resource allocation.

[Insert Table 8 around here]

4.7 Channels through Which Female CFOs Influence Zombie Likelihood

Table 3 shows that the impact of female executives on zombie likelihood is mainly achieved through financial supervision by female CFO, rather than female CEO's management effort. To further examine the channels through which female CFOs reduce zombie likelihood. According to Li and Zheng (2019) and the references therein, we consider two main channels through which female CFOs reduce zombie likelihood: corporate governance and information disclosure. To this end, we add these two variables to equation (3). we use the separation of ownership from control as the proxy to the quality of corporate governance and earnings restatement to the quality of information disclosure.

[Insert Table 9 around here]

Table 9 shows that financial restatement can significantly reduce zombie likelihood. The interaction between female CFOs and financial restatement passes the significance test, and the coefficient is negative. This evidence shows that the financial supervision of female CFOs is mainly achieved by improving the quality of information disclosure. The coefficient of corporate governance is not significant, perhaps because many listed companies in China are state-owned enterprises, and the quality of corporate governance in them is not high. However, the estimated coefficient of the interaction between female CFOs and corporate governance is statistically significant.

It shows that female executives reduce zombie likelihood by improving corporate governance.

4.8 The Executive's Gender Transition on Zombie Likelihood

To further examine the differences in the impact of female and male executives on zombie companies, we examine the differences in corporate performance before and after the company executives change. We did group regression on male-female CFO/CEO, and female-male CFO/CEO. The calculation results are shown in Table 10.

[Insert Table 10 around here]

Table 10 shows that the transition of male CFOs to female CFOs reduces the zombie likelihood. However, the transition of female CFO to male CFO and the transition of CEO (female-male or male-female) fail to pass the significant test. In order to further examine the difference between the transition from male-female CFO/CEO vs. male-male CFO/CEO, we use the difference-in-difference method to investigate the impact of the general election. The control group is male executives before and after the election, that is, male-male CFO/CEO. The treatment group is male-female CFO/CEO. The results are shown in Table 11.

[Insert Table 11 around here]

The results show that the general election leads to an increase in the zombie likelihood. However, whether it is a CFO or a CEO, the replacement of male executives with female executives leads to a decline in zombie likelihood. This evidence shows that additional female executives on the board of directors reduce zombie likelihood by increasing the quality of information disclosure and improving corporate governance.

4.9 Discussion on the Empirical Results

Numerous studies have shown that the participation of females in the board of directors helps the company give full play to one of the advantages of females over males, which is prudence. Female executives tend to be more sensitive to market trends in female consumer goods and more effective in communication with female executives in other companies. Also, an increase in the percentage of female executives does not only meet the regulatory requirements of gender diversity but also promotes corporate image and make better board decisions, thereby reducing zombie likelihood. On the other hand, as Chinese local governments hold shares of local state-owned companies, ownership structure undoubtedly affects corporate performance, given the inextricable connection between local governments and local state-owned companies. In China, financial institutions tend to support the government. Hence the impact of the link between political power and financial resource allocation on zombie likelihood should be noted as well.

We find that the participation of females on the board does reduce zombie likelihood, which is robust to instrumental variables. Zombie likelihood increases with the percentage of state-shareholding as well as the percentage of executive shareholding. Zombie likelihood declines with the percentage of shares held by foreign capital. Moreover, zombie likelihood increases with the size of assets and financing costs.

Analysis of the impact of executives' previous appointment in government agencies on corporate performance shows that government agency appointment background increases zombie likelihood. The financial experience of executives also

increases zombie likelihood. DID's results show that female CFOs tend to be cautious after the late 2000s global financial crisis, which can effectively reduce business risks.

5. Conclusion

This paper contributes to the existing literature on executive gender diversity by using a new data set from Chinese listed companies for an analysis of the impact of gender diversity, corporate ownership, and executive background on zombie likelihood. Our findings suggest that an increase in female executive percentage can significantly reduce corporate risk. The main channel is the quality improvement in information disclosure and corporate governance structure. Female CFOs would significantly reduce zombie likelihood through financial supervision. By contrast, an increase in state shareholding percentage increases zombie likelihood. Executives' previous appointments in government agencies significantly increase zombie likelihood. This finding implies that the strong motivation of local governments to intervene in local economies may be harmful. The inextricable connections between corporate executives and local governments further exacerbated zombie likelihood.

To alleviate the problem of Chinese listed zombie firms, the boundary between the government and the firm needs to be better defined. It is necessary to speed up the decoupling between local governments and state-owned banks for a more efficient allocation of credit resources. The level of open-up in the financial sector needs to be enhanced, and the financial sector's support for the real economy should be achieved through market competition rather than collusion. Second, it is necessary to deepen the

decoupling between the government and the business and to reduce government intervention in the operation of state-owned firms substantially. Third, "*harden*" budget constraints need to be hardened, and government supports to zombie firms need to be terminated. The release of financial resources from zombie firms does improve not only the efficiency in the allocation of financial resources but also reduces the systemic risks of China's financial sector.

Also, the appraisal approach of officials' performance needs to be improved. This issue will terminate the economic growth-based evaluation of the performance of local officials and eliminate the institutional foundation of zombie firms. Finally, to improve the quality of corporate governance, full play should be given to the advantage of female executives.

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Table 1. Descriptive statistics. This table reports the summary statistics of executives, ownership, and background information in our sample.

Variable	Num	Mean	Sd	Min	p50	Max
Zombie firm	44486	0.211	0.408	0	0	1
Female executives percentage	35662	0.060	0.110	0	0	1
Industry-level female executives percentage	37382	0.060	0.030	0	0.060	0.400
State shareholding percentage	45393	0.240	0.390	0	0	1
Foreign shareholding percentage	45393	0.020	0.100	0	0	1
Executives shareholding percentage	45393	0.160	0.330	0	0	1
Leverage ratio	44408	0.640	1.620	0	0.510	142.700
Percentage of executives with financial background	44456	0.240	0.210	0	0.270	1
Percentage of female executives with financial background	35665	0.170	0.200	0	0.130	1
Number of executives with financial background	36569	4.860	5.020	0	5	57
Number of female executives with financial background	36569	1.210	1.460	0	1	15
Female cfo	36572	0.220	0.410	0	0	1
Female board chair	45393	0.053	0.050	0	0	1
Female ceo	35665	0.050	0.210	0	0	1
Female ceocfo	45393	0.047	0.030	0	0	1
Total assets (million)	44486	11329	190000	0.120	1795	20498750
Operating income (million)	44456	3546	31361	0	569.7	1782763
Financial costs (million)	44456	51.29	292.4	-3097	6.670	16705
Net profit (million)	44456	214.8	1874	-7792	34.42	119962
Separation of ownership from control	29642	5.147	7.985	-63.09	0	70.800
Corporate governance	43726	0.071	0.258	0	0	1
Political background	24366	86.814	10.733	18.107	88.580	99
Political background: Female	3571	90.060	16.455	4	99	99
Institutional level	24366	85.313	11.724	15.786	87.011	99
Institutional level: Female	3571	88903	18.001	1	99	99
Academic background	24382	3.503	0.310	1	3.550	4
Academic background: Female	3559	3.493	0.650	1	3.800	4
Financial background	24366	91.361	8.320	4.666	93.240	99
Financial background: Female	3571	92.300	14.773	1	99	99

Table 2. The impact of female executives on zombie likelihood. This table reports the impact of female executives on zombie likelihood in the context of different control variables. Among them, the dependent variable is a dummy variable: 0 means that this firm is not a zombie, while 1 means a zombie firm. The percentage of female executives takes into consideration all different executive positions. State shareholding percentage and foreign shareholding percentage respectively represent the non-tradable shares held by the Chinese state government and foreign firms. The executive shareholding percentage represents the percentage of non-circulation shares held by CEOs, general managers, deputy general managers, and chief financial officers in the total of non-circulation shares. The leverage ratio is the ratio of total liabilities to total assets. *, **, and *** represent the significance levels of 10%, 5%, and 1%, respectively, and the P values are shown in parentheses. We control individual and time-fixed effects in all regressions and use robust standard errors.

	(1)	(2)	(3)	(4)
Female executives percentage	-0.035***	-0.034***	-0.034***	-0.033***
	(0.072)	(0.084)	(0.083)	(0.085)
State shareholding percentage	0.018**	0.020**	0.020**	0.020**
	(0.034)	(0.018)	(0.018)	(0.017)
Foreign shareholding percentage	-0.112***	-0.114***	-0.114***	-0.114***
	(0.001)	(0.000)	(0.000)	(0.000)
Executives shareholding percentage	0.085***	0.087***	0.087***	0.087***
	(0.000)	(0.000)	(0.000)	(0.000)
Leverage ratio	-0.006	-0.006	-0.006	-0.006
	(0.136)	(0.135)	(0.135)	(0.134)
Total assets		0.0524***	0.060***	0.042**
		(0.000)	(0.001)	(0.033)
Operating income			-0.016	-0.025
			(0.318)	(0.189)
Financial costs				3.421*
				(0.063)
Net profit				0.536**
				(0.026)
_cons	-0.290***	-0.284***	-0.284***	-0.284***
	(0.000)	(0.000)	(0.000)	(0.000)
Firm fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes
R^2	0.038	0.039	0.039	0.040
N	35517	35517	35517	35517

Table 3. Female CEO, CFO's influence on the formation of zombies. This table reports the impact of female CFOs, female board chairs, female CEOs, and female CFOs +CEOs (in columns 1-4) on zombie likelihood. *, ** and *** represent the significance levels of 10%, 5% and 1%, respectively. Robust standard errors were used in the regression, with P values in parentheses.

	(1)	(2)	(3)	(4)
	CFO	Chair	CEO	CEOCFO
State shareholding percentage	0.021**	0.020**	0.020**	0.020**
	(0.016)	(0.017)	(0.017)	(0.017)
Foreign shareholding percentage	-0.115***	-0.114***	-0.115***	-0.114***
	(0.000)	(0.000)	(0.000)	(0.000)
Executives shareholding percentage	0.087***	0.087***	0.087***	0.087***
	(0.000)	(0.000)	(0.000)	(0.000)
Leverage ratio	-0.006	-0.006	-0.006	-0.006
	(0.133)	(0.134)	(0.129)	(0.134)
Total assets	0.041**	0.042**	0.042**	0.042**
	(0.035)	(0.033)	(0.033)	(0.034)
Operating income	-0.026	-0.025	-0.026	-0.025
	(0.184)	(0.189)	(0.183)	(0.189)
Financial costs	3.433*	3.419*	3.439*	3.420*
	(0.061)	(0.063)	(0.061)	(0.063)
Net profit	0.533**	0.536**	0.537**	0.536**
	(0.028)	(0.027)	(0.026)	(0.026)
Female cfo	-0.021**			
	(0.010)			
Female chair		0.008		
		(0.886)		
Female CEO			0.031**	
			(0.043)	
Female CEO CFO				0.006
				(0.935)
_cons	-0.281***	-0.284***	-0.285***	-0.284***
	(0.000)	(0.000)	(0.000)	(0.000)
Firm fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes
R^2	0.040	0.039	0.040	0.039
N	35554	35554	35554	35554

Table 4. Female CEO, CFO's influence on zombie likelihood: propensity score matching estimates. This panel reports parameter estimates from the probability model, which are used to estimate propensity scores. This sample covers the annual observations of all firm-level variables for 1997-2018. The dependent variable is the zombie likelihood, and the independent variables are all the firm characteristics included in our panel regression analysis. We use a one-to-one match, and the absolute value of the propensity score between a company run by female executives and its matching peers does not exceed 0.5%. Columns (1) and (2) report the return of CFO and CEO propensity scores. *, ** and *** represent the significance levels of 10%, 5% and 1%, respectively. Robust standard errors were used in the regression, with P values in parentheses.

	(1)	(2)
	CFO	CEO
State shareholding percentage	-0.0188	-0.0371
	(0.110)	(0.168)
Foreign shareholding percentage	-0.0782*	-0.1615
	(0.098)	(0.132)
Executives shareholding percentage	0.0203	0.0219
	(0.185)	(0.557)
Total assets	0.025	-0.057
	(0.371)	(0.132)
Operating income	0.071	0.049
	(0.113)	(0.963)
Financial costs	0.6779***	4.3178***
	(0.004)	(0.000)
Net profit	-1.079*	1.922
	(0.059)	(0.588)
Control group	0.0582**	0.0428
	(0.023)	(0.335)
Treatment group	-0.0650**	-0.0451
	(0.017)	(0.323)
_cons	0.9382***	0.9365***
	(0.000)	(0.000)
Firm fixed effect	Yes	Yes
Time fixed effect	Yes	Yes
R^2	0.025	0.077
N	14129	3083

Table 5. Female CEO, CFO's influence on zombie likelihood: high-dimensional fixed effects. This table reports the impact of female CFOs, female board chairs, female CEOs, and female CFOs+CEOs (in columns 1-4) on zombie likelihood. In order to control the potential endogeneity caused by the unobserved cross-firm heterogeneity as well as cross-industry time-varying heterogeneity, the interaction terms of the industry fixed effect and the year fixed effect are controlled.*, ** and *** represent the significance levels of 10%, 5%, and 1%, respectively. Robust standard errors were used in the regression, with P values in parentheses.

	(1)	(2)	(3)	(4)
	CFO	Chair	CEO	CEOCFO
State shareholding percentage	0.018**	0.017**	0.017*	0.017**
	(0.047)	(0.049)	(0.050)	(0.049)
Foreign shareholding percentage	-0.108***	-0.107***	-0.108***	-0.107***
	(0.002)	(0.002)	(0.002)	(0.002)
Executives shareholding percentage	0.078***	0.078***	0.078***	0.078***
	(0.000)	(0.000)	(0.000)	(0.000)
Total assets	0.825***	0.834***	0.832***	0.831***
	(0.003)	(0.003)	(0.003)	(0.003)
Operating income	-0.487	-0.468	-0.471	-0.469
	(0.239)	(0.257)	(0.253)	(0.255)
Financial costs	20.642	19.771	20.232	20.021
	(0.284)	(0.305)	(0.292)	(0.299)
Net profit	4.148	3.981	3.983	4.023
	(0.109)	(0.121)	(0.121)	(0.118)
Female cfo	-0.019**			
	(0.023)			
Female chair		0.050		
		(0.382)		
Female CEO			0.035**	
			(0.028)	
Female CEO CFO				0.029
				(0.612)
_cons	0.551***	0.554***	0.549***	0.553***
	(0.001)	(0.001)	(0.001)	(0.001)
Firm fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes
Industry*Year fixed effects	Yes	Yes	Yes	Yes
R^2	0.112	0.111	0.112	0.111
N	32072	32072	32072	32072

Table 6. Effects of executive background on the proportion of zombie firms. This table reports the proportion of executives with financial backgrounds, the percentage of female executives with financial backgrounds, the number of executives with financial backgrounds, the number of female executives with financial backgrounds, and the impact of financial backgrounds on zombie likelihood. *, ** and *** represent the significance levels of 10%, 5% and 1%, respectively. Robust standard errors were used in the regression, with P values in parentheses.

	(1)	(2)	(3)	(4)
Female executives percentage	-0.013	-0.034*	-0.027	-0.017
	(0.504)	(0.080)	(0.167)	(0.378)
State shareholding percentage	0.027***	0.020**	0.001	0.022***
	(0.002)	(0.017)	(0.898)	(0.009)
Foreign shareholding percentage	-0.112***	-0.114***	-0.172***	-0.114***
	(0.000)	(0.000)	(0.000)	(0.000)
Executives shareholding	0.079***	0.087***	0.001	0.084***
percentage	(0.000)	(0.000)	(0.930)	(0.000)
Leverage ratio	-0.006	-0.006	-0.006	-0.006
	(0.022)	(0.033)	(0.008)	(0.031)
Total assets	0.044**	0.042**	0.049***	0.048**
	(0.059)	(0.190)	(0.044)	(0.138)
Operating income	-0.035*	-0.025*	-0.038**	-0.035*
	(0.054)	(0.062)	(0.053)	(0.062)
Financial costs	3.440**	3.431**	3.698**	3.974**
	(0.021)	(0.026)	(0.012)	(0.025)
Net profit	0.504**	0.537**	0.581***	0.565**
	(0.022)	(0.033)	(0.008)	(0.031)
Percentage of executives with a financial background	-0.396***			
	(0.000)			
Percentage of female executives with a financial background		0.005		
		(0.811)		
Number of executives with a financial background			-0.013***	
			(0.000)	
Number of female executives with a financial background				-0.018***
				(0.000)
_cons	-0.293***	-0.284***	-0.271***	-0.287***
	(0.000)	(0.000)	(0.000)	(0.000)
Firm fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes
R^2	0.055	0.039	0.044	0.042
N	35554	35554	35554	35554

Table 7. Effects of industry-level executive background on the proportion of zombie companies. This table reports the results of the robustness test using industry-level counterparts. *, ** and *** represent the significance levels of 10%, 5% and 1%, respectively. Robust standard errors were used in the regression, with P values in parentheses.

	(1)	(2)	(3)	(4)
Industry-level female executives	0.1465**	0.1276*	0.1282**	0.1386**
percentage	(0.162)	(0.231)	(0.230)	(0.192)
State shareholding percentage	0.0258***	0.0194**	0.0213**	0.0014***
	(0.003)	(0.023)	(0.013)	(0.871)
Foreign shareholding percentage	-0.1118***	-0.1143***	-0.1138***	-0.1703***
	(0.000)	(0.000)	(0.000)	(0.000)
Executives shareholding percentage	0.0784***	0.0871***	0.0843***	0.0013**
	(0.000)	(0.000)	(0.000)	(0.899)
Leverage ratio	-0.0057	-0.0060	-0.0060	0.0067***
	(0.174)	(0.134)	(0.140)	(0.000)
Total assets	0.046**	0.044**	0.051***	0.048***
	(0.023)	(0.035)	(0.032)	(0.009)
Operating income	-0.038**	-0.028*	-0.040**	-0.039***
	(0.060)	(0.191)	(0.139)	(0.045)
Financial costs	3.438**	3.436***	3.720**	3.988***
	(0.048)	(0.056)	(0.056)	(0.054)
Net profit	0.498**	0.542**	0.596**	0.0572***
	(0.019)	(0.025)	(0.023)	(0.008)
Percentage of executives with a financial	-0.3959***			
background	(0.000)			
Percentage of female executives with a		0.0022		
financial background		(0.920)		
Number of executives with a financial				-0.0126***
background				(0.000)
Number of female executives with a			-0.0182***	
financial background			(0.000)	
_cons	-0.2978***	-0.2895***	-0.2916***	-0.2065***
	(0.000)	(0.000)	(0.000)	(0.000)
Firm fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes
R^2	0.056	0.040	0.042	0.045
N	35520	35520	35520	35521

Table 8. Political/personal background and zombie likelihood. This table reports the impact of the previous appointment in government agencies, academic backgrounds, and previous experience with financial institutions on zombie likelihood for female executives. Columns 1-8 represent respectively the impacts on zombie likelihood of 8 variables, namely the level of previous appointment in government agency for female executives, the level of previous appointment in government agency for all executives, the level of government agency in which the previous appointment is held for female executives, the level of government agency in which the previous appointment is held for all executives, academic background of all executives, academic background of female executives, the regulatory power of previously affiliated financial institutions for all executives, and the regulatory power of previously affiliated financial institutions for female executives. *, ** and *** represent the significance levels of 10%, 5% and 1%, respectively. Robust standard errors were used in the regression, with P values in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female executives percentage	-0.045** (0.51)	-0.016** (0.50)	-0.016** (0.49)	-0.045*** (0.51)	-0.017** (0.47)	-0.044*** (0.52)	-0.050*** (0.47)	-0.019** (0.42)
Political background: Female	-0.0008 (0.24)							
Political background		0.001** (0.02)						
Institutional level: Female			0.001*** (0.01)					
Institutional level				-0.001 (0.28)				
Academic background					0.024 (0.13)			
Academic background: Female						-0.022 (0.38)		
Financial background							0.002* (0.07)	
Financial background: Female								0.003*** (0.00)
_cons	0.811*** (0.00)	0.662*** (0.00)	0.661*** (0.00)	0.803*** (0.00)	1.540*** (0.00)	-0.231* (0.10)	0.603*** (0.00)	0.464*** (0.00)
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.055	0.048	0.048	0.054	0.048	0.059	0.056	0.050
N	3564	24313	24313	3564	24329	3552	3564	24313

Table 9. Channels through which female CFOs influence zombie likelihood. This table reports the channels through which female CFOs influence zombie likelihood. Columns 1-3 represent respectively the channels of corporate governance, earnings statement, and their interactions with female CFO. *, ** and *** represent the significance levels of 10%, 5%, and 1%, respectively. Robust standard errors are used in the regression, with P values in parentheses.

	(1)	(2)	(3)
State shareholding percentage	0.020**	0.026***	0.025***
	(0.021)	(0.004)	(0.004)
Foreign shareholding percentage	-0.117***	-0.138***	-0.141***
	(0.000)	(0.000)	(0.000)
Executives shareholding percentage	0.087***	0.095***	0.094***
	(0.000)	(0.000)	(0.000)
Leverage ratio	-0.006	-0.005	-0.005
	(0.133)	(0.254)	(0.252)
Total assets	0.041**	0.047***	0.041***
	(0.034)	(0.006)	(0.006)
Operating income	-0.025	-0.032*	-0.025*
	(0.185)	(0.068)	(0.067)
Financial costs	3.488*	1.840*	3.488*
	(0.057)	(0.246)	(0.227)
Net profit	0.534**	0.406*	0.534**
	(0.031)	(0.087)	(0.095)
Female CFO	-0.029***		-0.028***
	(0.000)		(0.003)
Corporate governance	-0.005	-0.011	
	(0.507)	(0.164)	
Female CFO* Corporate governance	-0.003**		
	(0.842)		
Earning statement		-0.001**	-0.001***
		(0.136)	(0.153)
Female CFO* Earning statement			-0.001***
			(0.372)
Firm fixed effect	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes
R^2	0.055	0.044	0.039
N	35554	35554	35554

Table 10. Executive general election and zombie likelihood. This table reports the impact of the executive general election on zombie likelihood. We do group regressions for male CFO/CEO to female CFO/CEO and female CFO/CEO to male CFO/CEO. Columns 1-4 represent the impacts of CFO, respectively: male-female, CFO: female-male, CEO: male-female and CEO: female-male. *, ** and *** represent the significance levels of 10%, 5% and 1%, respectively. Robust standard errors were used in the regression, with P values in parentheses.

	(1)	(2)	(3)	(4)
State shareholding percentage	-0.001	0.010	-0.010	0.005
	(0.483)	(0.468)	(0.660)	(0.844)
Foreign shareholding percentage	-0.139**	-0.157***	-0.035	-0.113
	(0.013)	(0.002)	(0.717)	(0.219)
Executives shareholding percentage	0.075***	0.099***	0.097***	0.083**
	(0.000)	(0.000)	(0.007)	(0.017)
Total assets	0.0371	0.044*	-0.046	-0.052
	(0.103)	(0.056)	(0.262)	(0.309)
Operating income	-0.007	-0.026	0.255	0.248
	(0.717)	(0.196)	(0.147)	(0.121)
Financial costs	8.055***	6.410**	18.426	20.433
	(0.002)	(0.016)	(0.113)	(0.116)
Net profit	-0.181	0.363	-1.817	-1.261
	(0.703)	(0.459)	(0.420)	(0.667)
CFO: male-female	-0.072***			
	(0.000)			
CFO: female-male		-0.028		
		(0.133)		
CEO: male-female			-0.120	
			(0.000)	
CEO: female-male				0.007
				(0.805)
_cons	0.796***	0.744***	0.830***	0.760***
	(0.000)	(0.000)	(0.000)	(0.000)
Firm fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	Yes	Yes	Yes	Yes
R^2	0.024	0.041	0.043	0.031
N	12080	14698	4062	4891

Table 11. The executive's gender transition on zombie likelihood (DID). This table reports the difference-in-differences results of the impact of female executives on zombie likelihood. The control group is Male_Male_CFO/CEO, and the treatment group is divided into two types: Male_Female_CFO, Male_Female_CEO, respectively, for Male-Female CFO transition after the general election and Male-Female CEO transition after the general election. Columns (1)-(2) are CFO and CEO, respectively. *, ** and *** represent the significance levels of 10%, 5% and 1%, respectively. Robust standard errors are used in the regression, with P values in parentheses.

	(1)	(2)
	CFO	CEO
State shareholding percentage	0.001	-0.001
	(0.961)	(0.957)
Foreign shareholding percentage	-0.126***	-0.177***
	(0.004)	(0.003)
Executives shareholding percentage	0.073***	0.081***
	(0.000)	(0.003)
Total assets	0.040**	-0.002
	(0.024)	(0.971)
Operating income	-0.025	0.251**
	(0.210)	(0.017)
Financial costs	3.198	7.637***
	(0.112)	(0.010)
Net profit	0.346	-1.798*
	(0.258)	(0.062)
General election	0.124***	0.078***
	(0.000)	(0.000)
CFO: male-female	-0.076***	
	(0.002)	
CEO: male-female		-0.092
		(0.004)
_cons	0.777***	0.809***
	(0.000)	(0.000)
Firm fixed effect	Yes	Yes
Time fixed effect	Yes	Yes
R^2	0.024	0.026
N	16334	7584

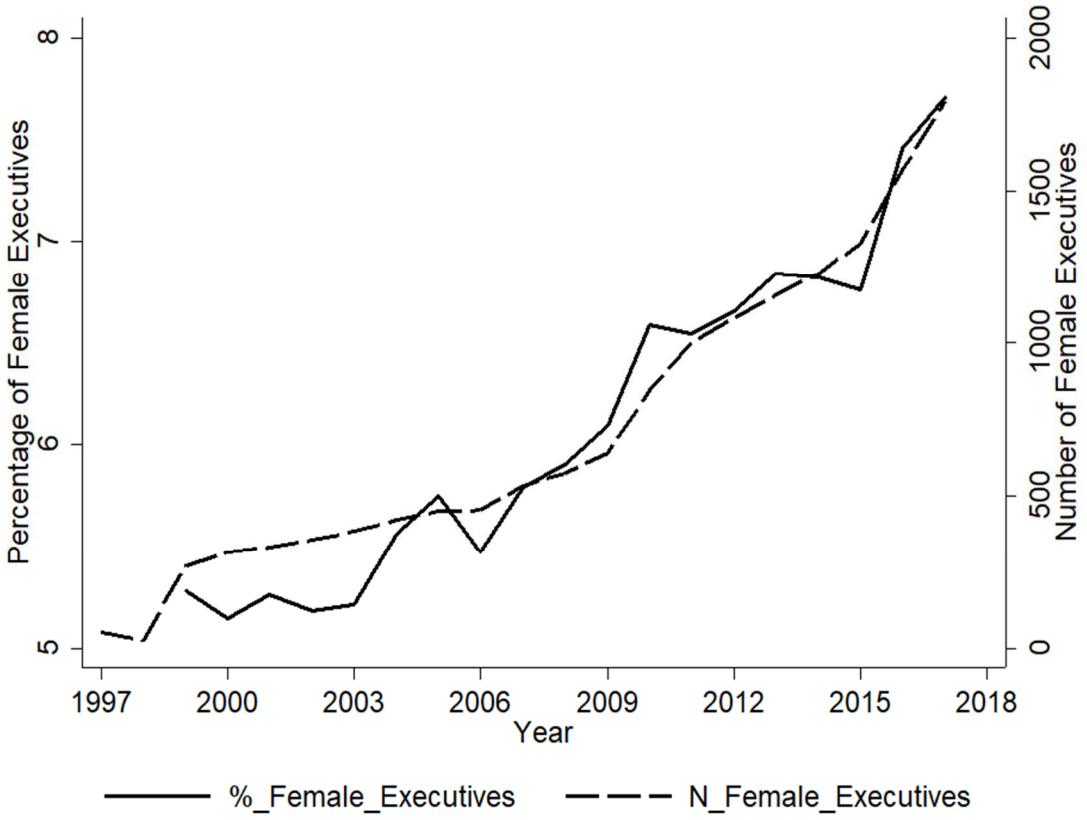

Figure 1. Percentage and number of female executives (1997-2018)